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Socioeconomic inequalities related to noncommunicable diseases and their limitations: National Health Survey, 2019

Desigualdades socioeconômicas relacionadas às doenças crônicas não transmissíveis e suas limitações: Pesquisa Nacional de Saúde, 2019

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ABSTRACT: ***Objective:*** to analyze socioeconomic inequalities in the self-reported prevalence of NonCommunicable Diseases (NCDs) and their disabilities in the Brazilian adult population. ***Methods:*** Cross-sectional study with data from the National Health Survey carried out in 2019. The self-reported prevalences of individuals with some noncommunicable diseases were calculated, according to sociodemographic characteristics; and the prevalence and prevalence ratio of these diseases and degrees of disability, according to education and possession of a private health plan. Results: 47.6% of the population reported having at least one noncommunicable diseases. Noncommunicable diseases increased progressively with age and were more prevalent in women (PR 1.13; 95%CI 1.1–1.15), in black (PR 1.04; 95%CI 1.01–1, 06) or brown individuals (PR 1.05; 95%CI 1.01–1.09), illiterate or with incomplete elementary education (PR 1.12; 95%CI 1.08–1.16), in the Southeast (PR 1.10; 95%CI 1.05–1.14) and the South (PR 1.07; 95%CI 1.03–1.12) and among individuals who do not have private health insurance (PR 1.02; 95%CI 1.0–1.05). For the majority of noncommunicable diseases investigated, the highest reports of disabilities were among those with low education and without health insurance. Conclusion: adults with less education and without private health plans have a higher prevalence of noncommunicable diseases and a higher degree of disability. Thus, it is important to analyze health indicators in the face of different populations and disparities, in order to understand and monitor health inequalities.

Keywords: Chronic disease. Disabled persons. Health status disparities. Socioeconomic factors.

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RESUMO: ***Objetivo:*** Analisar as desigualdades socioeconômicas na prevalência autorreferida de doenças crônicas não transmissíveis e suas limitações na população adulta brasileira. ***Métodos:*** Estudo transversal com dados da Pesquisa Nacional de Saúde realizada em 2019. Calcularam-se as prevalências autorreferidas de indivíduos com alguma doença crônica não transmissível, segundo características sociodemográficas, e as prevalências e a razão de prevalência dessas doenças e seus graus de limitações, segundo escolaridade e posse de plano de saúde privado. ***Resultados:*** 47,6% da população relatou ter pelo menos uma doença crônica não transmissível. As doenças crônicas não transmissíveis aumentaram progressivamente com a idade e foram mais prevalentes nas mulheres (RP 1,13; IC95% 1,10–1,15), nos indivíduos pretos (RP 1,04; IC95% 1,01–1,06) ou pardos (RP 1,05; IC95% 1,01–1,09), analfabetos ou com ensino fundamental incompleto (RP 1,12; IC95% 1,08–1,16), nos moradores das regiões Sudeste (RP 1,10; IC95% 1,05–1,14) e Sul (RP 1,07; IC95% 1,03–1,12) e entre os indivíduos que não possuem plano de saúde privado (RP 1,02; IC95% 1,00–1,05). Para a maioria das doenças crônicas não transmissíveis investigadas, a maior prevalência do relato de limitação esteve entre aqueles com baixa escolaridade e sem plano de saúde. ***Conclusão:*** Adultos com menor escolaridade e sem planos de saúde privados apresentam maior prevalência de doenças crônicas não transmissíveis e maior grau de limitação. É importante avaliar os indicadores de saúde ante as diferentes populações e desigualdades, a fim de diagnosticar e monitorar as iniquidades em saúde.

Palavras-chave: Doença crônica. Pessoas com deficiência. Desigualdades em saúde. Iniquidade social.

INTRODUCTION

The epidemic of noncommunicable diseases (NCDs) results in devastating consequences for individuals, their families, and communities, in addition to overburdening health systems[1].

NCDs are one of the biggest global health problems, responsible for 41 million deaths in the world (71% of all deaths)[2]. Of these deaths, 15 million are premature (<70 years of age). The burden of these diseases is greater in low- and medium-low-income countries, and in Brazil, NCDs are the most frequent causes and accounted for approximately 76% of the causes of death in 2017[3].

Evidence indicates a proportional increase in NCDs due to the growth of the four main risk factors (tobacco, physical inactivity, alcohol abuse, and unhealthy diets) and also to population aging. Thus, interventions on risk factors would result in a reduction in the number of deaths, in addition to improving the quality of life and health[4,5].

NCDs more frequently affect low-income populations, as they are more vulnerable, exposed to risks, and have less access to health services and health promotion and disease prevention practices. People with NCD have their poverty situation aggravated by family expenses with the disease[6]. Studies show that social determinants, such as education, occupation, income, gender, and ethnicity contribute to the increase in NCDs and morbidity and mortality[4,7]. Socioeconomic differences result in harm to people in conditions of greater social vulnerability, increasing their limitations and health inequity[8,9].

In this context, knowledge of the population's health situation is the first step to plan actions and programs that reduce the occurrence and severity of NCDs. Monitoring health indicators is essential to assess trends in the health situation, aiming to identify the evolution of health inequalities[10]. Analyzing this information is also a way to support the monitoring of international commitments, such as the 2030 Agenda of the Sustainable Development Goals (SDGs)[11].

In light of the above, the aim of this study was to analyze socioeconomic inequalities in the self-reported prevalence of NCDs and the limitations resulting from these morbidities in the Brazilian adult population.

METHODS

This is a cross-sectional study with data from the 2019 National Health Survey (*Pesquisa Nacional de Saúde* – PNS), which is a population-based survey, representative of the Brazilian population, carried out by the Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística* – IBGE) in partnership with the Ministry of Health[12].

The research used a probabilistic cluster sample in three stages, with the census tracts being the primary unit, the households the secondary, and a resident aged 15 years old or older, randomly selected from each household, the tertiary. Households and residents were selected by simple random sampling. The target population of the 2019 PNS was individuals aged 15 years old or older, residing in permanent private households. However, for the analyses of the present study, individuals under 18 years of age were excluded, thus, the final sample consisted of 88,531 individuals. Methodological details can be obtained from PNS publications[12,13].

The diseases considered as NCDs were: arterial hypertension; diabetes; heart disease; stroke; asthma; arthritis or rheumatism; chronic back problem; work-related musculoskeletal disorder (WMSD); chronic lung disease (pulmonary emphysema, chronic bronchitis or COPD), cancer; chronic renal failure. The presence of a self-reported diagnosis of hypertension was evaluated by the following question: "Has any doctor ever given you the diagnosis of arterial hypertension?", and thus the self-reported diagnoses were successively evaluated for the other diseases mentioned above, with the exception of chronic back problem, which was evaluated by the question: "Do you have any chronic back problems, such as chronic back or neck pain, low back pain, sciatica, problems in the vertebrae or disc?".

Regarding the degree of limitation in usual activities, the following question is asked: "In general, to what degree does hypertension or some complication of hypertension limit your usual activities (such as working, studying, doing housework, etc.)?". Answer options are:

1. Does not limit;
2. A little;
3. Moderately;

4. Deeply;
5. Very deeply.

Thus, it went on for all the aforementioned diseases. For this study, only the answers "Deeply" and "Very deeply" were considered.

The following estimates were calculated: prevalence of individuals who reported a diagnosis of at least one NCD, according to sociodemographic variables: gender, age, education, race/color, region, and having a private health insurance; prevalence and prevalence ratio (PR) for each NCD, according to education level and private health insurance; and prevalence of deep or very deep limitations caused by NCDs, also according to education level and private health insurance.

Analyses included estimates of prevalence rates and respective 95% confidence intervals (95%CI) and crude and adjusted PR (PRadj) by gender, age, and region, obtained using Poisson regression with robust variance. All analyses were performed using the Data Analysis and Statistical Software (Stata), version 14, using the survey module that considers the post-stratification weights.

The PNS was approved by the National Research Ethics Commission (*Comissão Nacional de Ética em Pesquisa* – CONEP) of the Ministry of Health, under opinion number 3.529.376. The adult's participation in the research was voluntary, and the confidentiality of the information was guaranteed. PNS 2019 data is available for public access and use.

RESULTS

The results revealed that 47.6% of the Brazilian adult population reported at least one NCD. Prevalences were higher in women (PR 1.13; 95%CI 1.10–1.15) and progressively increased with age. Black (PR 1.04; 95%CI 1.01–1.06) or brown (RP 1.05; 95%CI 1.01–1.09) and illiterate or with incomplete elementary/middle education (PR 1.12; 95%CI 1.08–1.16) individuals also showed higher prevalences. NCDs were more prevalent in the Southeast (PR 1.10; 95%CI 1.05–1.14) and South (RP 1.07; 95%CI 1.03–1.12) and among individuals who do not have a private health insurance (PR 1.02; 95%CI 1.00–1.05) (Table 1). On the other hand, they were less prevalent among those with higher income, above three minimum wages (PR 0.94; 95%CI 0.91–0.98) (data not shown).

Table 2 shows the prevalence and adjusted PR of each NCD, according to education. For most diseases, the highest prevalence occurred in individuals with low or no education, compared to the population with complete higher education: hypertension (PR 1.38; 95%CI 1.29–1.46), diabetes (PR 1.77; 95%CI 1.56–2.02), heart disease (PR 1.27; 95%CI 1.10–1.47), stroke (PR 2.71; 95%CI 2.06–3.57), rheumatism (PR 1.35; 95%CI 1.18–1.55), back problems (PR 1.37; 95%CI 1.28–1.48), chronic lung disease (PR 1.61; CI95 % 1.16–2.23). However, other diseases such as asthma (PR 0.75; CI 95% 0.64–0.88), WMSD (PR 0.94; CI 95% 0.73–1.21) and cancer (PR 0.64; CI 95% 0.54–0.77), were less prevalent in these individuals.

Table 1. Self-reported prevalence and crude and adjusted prevalence ratio of having at least one noncommunicable disease, according to sociodemographic characteristics. National Health Survey, 2019.

		P	95%CI	PR_{crude}	95%CI	PR_{adj}	95%CI
	Total	47.63					
Gender	Male	43.73	42.84–44.62	1.00		1.00	
	Female	51.06	50.21–51.91	1.17	1.14–1.20	1.13	1.1–1.15
Age (years)	18–24	20.62	18.98–22.25	1.00		1.00	
	25–34	25.28	24.01–26.54	1.23	1.12–1.34	1.22	1.12–1.34
	35–44	38.51	37.25–39.76	1.87	1.72–2.03	1.86	1.71–2.02
	45–54	55.21	53.55–56.87	2.68	2.46–2.91	2.66	2.44–2.89
	55–64	69.91	68.58–71.24	3.39	3.13–3.67	3.36	3.10–3.64
	65 and more	80.73	79.74–81.72	3.92	3.62–4.24	3.86	3.56–4.18
Race/ Color	White	49.42	48.45–50.38	1.00		1.00	
	Black	45.85	44.94–46.75	0.93	0.90–0.95	1.04	1.01–1.06
	Brown	47.66	45.99–49.33	0.96	0.93–1.00	1.05	1.01–1.09
	Others	47.97	42.66–53.28	0.97	0.87–1.09	0.99	0.91–1.07
Education	Complete Higher degree	44.11	42.63–45.60	1.00		1.00	
	High School/ Incomplete Higher Degree	37.37	36.29–38.46	0.85	0.81–0.88	1.00	0.96–1.03
	Elementary/Middle School/Incomplete High School	42.73	41.17–44.30	0.97	0.92–1.02	1.07	1.02–1.12
	Illiterate/ Incomplete Elementary/ Middle School	61.58	60.56–62.60	1.40	1.34–1.45	1.12	1.08–1.16
Region	North	40.98	39.46–42.50	1.00		1.00	
	Northeast	45.87	44.86–46.87	1.12	1.07–1.17	1.04	1.00–1.90
	Southeast	50.09	48.87–51.31	1.22	1.17–1.28	1.10	1.05–1.14
	South	49.10	47.65–50.55	1.20	1.14–1.26	1.07	1.03–1.12
	Centro-Oeste	43.69	42.20–45.18	1.07	0.03–1.12	1.06	0.03–1.12
Health insurance	Yes	46.52	45.79–47.25	1.00		1.00	
	No	50.62	49.37–51.87	1.09	1.06–1.12	1.02	1.00–1.05

P: self-reported prevalence; PR_{crude}: crude prevalence ratio; PR_{adj}: adjusted prevalence ratio.

Table 2. Prevalence and prevalence ratio of having a noncommunicable disease, according to education. National Health Survey, 2019.

NCD	Measures	a	b	c	d
Hypertension	P	36.55	20.38	15.44	18.17
	PR* (95%CI)	1.38 (1.29–1.46)	1.30 (1.21–1.41)	1.13 (1.06–1.22)	1.00
Diabetes	P	12.89	6.26	4.58	4.65
	PR* (95%CI)	1.77 (1.56–2.02)	1.55 (1.31–1.82)	1.34 (1.16–1.54)	1.00
Heart disease	P	7.83	4.78	3.47	4.25
	PR* (95%CI)	1.27 (1.10–1.47)	1.25 (1.04–1.51)	1.05 (0.89–1.23)	1.00
Stroke	P	3.77	1.65	0.80	0.82
	PR* (95%CI)	2.71 (2.06–3.57)	2.21 (1.53–3.19)	1.27 (0.93–1.73)	1.00
Asthma	P	4.44	5.58	5.32	6.69
	PR* (95%CI)	0.75 (0.64–0.88)	0.82 (0.68–0.98)	0.75 (0.65–0.88)	1.00
Rheumatism	P	11.65	6.15	4.91	5.78
	PR* (95%CI)	1.35 (1.18–1.55)	1.25 (1.07–1.45)	1.15 (1.02–1.31)	1.00
Spine/back problem	P	29.16	18.18	16.79	18.63
	PR* (95%CI)	1.37 (1.28–1.48)	1.09 (0.99–1.19)	1.04 (0.96–1.13)	1.00
WMSD	P	2.39	2.36	2.52	2.89
	PR* (95%CI)	0.94 (0.73–1.21)	1.04 (0.77–1.41)	1.12 (0.91–1.38)	1.00
Lung disease	P	2.18	1.67	1.32	1.30
	PR* (95%CI)	1.61 (1.16–2.23)	1.40 (0.98–2.01)	1.15 (0.81–1.64)	1.00
Cancer	P	3.28	1.93	1.77	3.28
	PR* (95%CI)	0.64 (0.54–0.77)	0.68 (0.52–0.90)	0.76 (0.63–0.91)	1.00
Kidney disease	P	1.98	1.72	1.08	0.98
	PR* (95%CI)	1.68 (1.21–2.34)	1.87 (1.28–2.74)	1.27 (0.9–1.78)	1.00

P: self-reported prevalence; PR: prevalence ratio; NCD: noncommunicable diseases; *PR: prevalence ratio adjusted by age, gender, and region. a: Illiterate/incomplete elementary/middle school; b: Complete elementary/Middle school / incomplete high school; c: Complete high school /incomplete higher degree; d: Complete higher degree.

When analyzing the degree of deep or very deep limitation in usual activities caused by NCDs, according to the level of education, it was also found that the prevalence of limitations is higher among the less educated and can be two to four times higher when comparing with those with higher education (Table 3).

Table 4 shows the prevalence and adjusted PR for having NCDs and deep or very deep limitation in usual activities, according to ownership of a private health insurance. Brazilians who do not have a private health insurance have a higher prevalence for all NCDs surveyed: hypertension (PR 1.85; 95%CI 1.34–2.57), diabetes (PR 1.88; 95%CI

Table 3. Prevalence and prevalence ratio of very deep or deep limitation, according to educational level. National Health Survey, 2019.

NCD	Measures	Total	a	b	c	d
Hypertension	P	3.01	4.08	2.96	1.59	0.98
	PR*		2.30	3.01	1.57	1.00
	95%CI		(2.30–8.41)	(1.45–6.22)	(0.78–3.16)	
Diabetes	P	5.83	7.31	4.02	4.51	1.97
	PR*		4.01	2.16	2.30	1.00
	PR*		1.72–9.36	0.87–5.34	0.92–5.74	
Heart disease	95%CI	11.90	16.33	11.54	6.53	4.01
	PR*		3.93	3.08	1.79	1.00
	95%CI		1.87–8.23	1.39–6.85	0.83–3.86	
Stroke	P	20.88	24.55	11.13	16.12	11.99
	PR*		1.96	1.03	1.44	1.00
	95%CI		1.10–3.51	0.48–2.2	0.74–2.80	
Asthma	P	6.39	10.89	6.33	4.40	3.34
	PR*		3.22	1.98	1.39	1.00
	95%CI		(1.73–5.97)	(0.97–4.06)	(0.74–2.63)	
Rheumatism	P	20.00	25.81	18.55	12.14	10.41
	PR*		2.47	1.80	1.21	1.00
	95%CI		(1.82–3.37)	(1.24–2.61)	(0.85–1.72)	
Spine/back problem	P	16.09	20.86	16.36	11.58	8.44
	PR*		2.36	2.07	1.50	1.00
	95%CI		(1.91–2.92)	(1.62–2.66)	(1.17–1.91)	
WMSD	P	17.59	28.25	20.78	11.06	8.41
	PR*		2.83	2.63	1.41	1.00
	95%CI		(1.67–4.80)	(1.45–4.77)	(0.82–2.41)	
Lung disease	P	14.00	20.28	12.10	8.53	5.46
	PR*		2.95	2.09	1.54	1.00
	95%CI		(1.32–6.59)	(0.77–5.66)	(0.64–3.68)	
Cancer	P	11.09	12.17	16.44	13.49	3.08
	PR*		4.67	6.32	4.49	1.00
	95%CI		(2.17–10.04)	(2.40–16.6)	(1.95–10.31)	
Kidney disease	P	12.17	15.54	13.93	8.17	4.09
	PR*		4.14	2.90	1.86	1.00
	95%CI		(1.50–11.45)	(0.95–8.86)	(0.60–5.79)	

P: self-reported prevalence; PR: prevalence ratio; NCD: noncommunicable diseases; *PR: prevalence ratio adjusted by age, gender, and region. a: Complete higher degree; b: Complete high school/incomplete higher degree; c: Complete elementary/middle school/incomplete high school; d: illiterate/incomplete elementary/middle school.

Table 4. Prevalence and prevalence ratio of having a noncommunicable disease and deep or very deep limitation, according to private health insurance. National Health Survey, 2019.

NCD	Measures	Health insurance		Limitation (P)	Health insurance	
		No	Yes		Yes	No
Hypertension	P	23.77	24.34	3.01	1.79	3.47
	PR* (95%CI)	1.85 (1.34–2.57)	1.00		1.00	1.85 (1.34–2.57)
Diabetes	P	7.67	7.88	5.83	3.65	6.67
	PR* (95%CI)	1.88 (1.22–2.89)	1.00		1.00	1.88 (1.22–2.89)
Heart disease	P	2.14	1.46	11.90	6.90	14.23
	PR* (95%CI)	2.15 (1.55–2.97)	1.00		1.00	2.15 (1.55–2.97)
Stroke	P	7.24	8.45	20.88	15.56	22.22
	PR* (95%CI)	1.43 (0.97–2.10)	1.00		1.00	1.43 (0.97–2.10)
Asthma	P	4.96	6.23	6.39	3.99	7.53
	PR* (95%CI)	1.9 (1.24–2.89)	1.00		1.00	1.90 (1.24–2.89)
Rheumatism	P	4.88	6.31	20.00	15.27	22.04
	PR* (95%CI)	1.46 (1.18–1.80)	1.00		1.00	1.46 (1.18–1.80)
Spine/back problem	P	21.34	22.21	16.09	11.34	17.92
	PR* (95%CI)	1.63 (1.40–1.89)	1.00		1.00	1.63 (1.40–1.89)
WMSD	P	2.14	3.49	17.59	11.50	21.25
	PR* (95%CI)	1.82 (1.27–2.63)	1.00		1.00	1.82 (1.27–2.63)
Lung disease	P	1.65	1.72	14.00	10.73	15.27
	PR* (95%CI)	1.48 (0.90–2.45)	1.00		1.00	1.48 (0.90–2.45)
Cancer	P	2.10	3.78	11.09	6.41	14.26
	PR* (95%CI)	2.09 (1.30–3.34)	1.00		1.00	2.09 (1.30–3.34)
Kidney disease	P	1.42	1.59	12.17	7.60	14.07
	PR* (95%CI)	1.60 (0.85–3.01)	1.00		1.00	1.60 (0.85–3.01)

P: self-reported prevalence; PR: prevalence ratio; NCD: noncommunicable diseases; *PR: prevalence ratio adjusted by age, gender, and region.

1.22–2.89), heart disease (PR 2.15; 95%CI 1.55–2.97), stroke (PR 1.43; 95%CI 0.97–2.1), asthma (PR 1.90; 95%CI 1.24–2.89), rheumatism (PR 1.46; 95%CI 1.18–1.80), back problems (PR 1.63; 95%CI 1.40–1.89), WMSD (PR 1.82; 95%CI 1.27–2.63), chronic lung disease (PR 1.48; 95%CI 0.90–2.45), cancer (PR 2.09; 95%CI 1.30– 3.34), and kidney disease (PR 1.6; 95%CI 0.85–3.01). Again, individuals without health insurance had higher limitations prevalence for all NCDs.

DISCUSSION

88,531 individuals aged over 18 years old were evaluated. Of these, 47.6% reported having at least one NCD, among the 11 diseases included. These diseases were more prevalent among women, individuals with black or brown race/color, illiterate or with incomplete primary education, in the Southeast and South regions, among individuals who do not have a private health insurance and with lower income. In general, there were more reports of limitations resulting from NCDs among those with less education and who did not have a private health insurance.

This study showed a high prevalence of NCDs in Brazil, where almost half of the population reported having at least one disease, which reflects a challenge for the health system and for the economy, considering that these diseases are responsible for most of the expenses for both treatment and prevention[14]. The prevalence and burden of NCD are the highest in several countries[15-17]. It is estimated that the global burden of NCDs will increase by 17% in the next decade[18].

The prevalence of NCDs was higher for females when compared to males. Possible explanations may be related to the greater access of women to health services in Brazil when compared to men, which may favor early diagnosis and treatment[19,20]. Women also have a greater perception of the symptoms and physical signs of diseases, which results in greater demand for and use of health services[19,21]. Furthermore, there is the influence of scientific and care developments[22], with the recognition of differences between genders regarding the clinical presentations of these diseases, given the hormonal, functional, and emotional aspects[22,23].

There is a direct relationship between the epidemiological and demographic transition processes, once that, as the number of aged people grows and life expectancy increases, NCDs also become more frequent[24], as found in the present study, which showed that diseases were more prevalent in the people aged 65 years old and older. The association between advancing age and progressive increase in NCDs is based in the literature, especially on the inherent alterations of senescence[25]. In addition, longevity can also provide longer exposure to risk factors, such as pollution, smoking, unhealthy diet, and sedentary lifestyle[26], contributing to the development of these diseases. In addition, aged people use health services more often, which can contribute to diagnosis[13,20,27].

NCDs were more prevalent in the Southeast and South regions. Although adjusted by region and age, these regions have distinct age structures and a greater concentration of aged people, wealth, and jobs[28,29]. In addition, the South and Southeast have greater availability of health services and a greater proportion of individuals with health insurance, which can favor the diagnosis and identification of these diseases[30].

This study showed greater magnitude of NCDs in black or brown individuals, illiterate or with incomplete primary education and who do not have a private health insurance and with lower income. There was also a greater report of limitations in usual activities among those with less education and who did not have private health insurance. These results show the impact of sociodemographic inequalities on the occurrence of NCDs. Social determinants,

such as income, education, and environment, contribute to the increase and severity of NCDs and morbidity and mortality[31], as low-income or socially disadvantaged individuals are more exposed to risk factors, have less access to health services, reducing opportunities for prevention and health promotion, as well as treatment for these diseases[32,33]. Other studies have shown that the prevalence of smoking and arterial hypertension were higher among adults with lower education[33,34], as well as the prevalence of obesity[35]. On the other hand, the consumption of healthy foods and the practice of physical activity were higher among individuals with better education levels[33-35]. However, for some unhealthy foods, such as sweets, sandwiches, snacks, and pizzas, there was a higher prevalence in the more favored social segments and in white individuals[36]. A study analyzed the degree of socioeconomic disparities in the prevalence of health behaviors in the Brazilian population, according to the 2013 PNS. The results revealed significant social inequalities among Brazilian adults, as the less educated, non-white, and without private health insurance showed a higher prevalence of smoking, physical inactivity, and low intake of healthy foods such as vegetables and fruits. In addition, non-white individuals consumed more alcoholic beverages[37]. Other studies have also shown that the population with private health insurance had a lower prevalence of NCDs and limitations, which is justified by having more access to health services, tests, and treatments[37-39]. In general, the poorest population has more morbidity and NCD[7], which reflects the country's socioeconomic disparities and reinforces the importance of investing in the Unified Health System (*Sistema Único de Saúde* – SUS) to promote opportunities for access to health services, diagnosis, and treatment of NCD for the most vulnerable population.

Hypertension was the most prevalent disease found in this study and is associated with more serious outcomes, such as cardiovascular diseases (CVD), cerebrovascular diseases, and renal failure[39,40]. Diabetes is a global public health problem, and its prevalence is increasing in Brazil and worldwide[41]. Chronic back problems and WMSD can affect a large portion of the population and represent one of the main causes of years of life lost due to limitation, resulting in an economic impact and on the quality of life of individuals[42,43]. Cancer and asthma were less prevalent in less educated individuals, showing an inverted gradient, which may be due to socioeconomic conditions, lower access to health services, and diagnosis among individuals with worse socioeconomic conditions[16].

Socioeconomic inequalities in health indicators or risk factors for NCDs, as well as in the occurrence of diseases and limitations, highlight the importance of monitoring these inequalities as part of national health policies and the need to prioritize health promotion and prevention actions of health problems, in addition to expanding and improving the capacity to access and offer health services for the diagnosis and treatment of NCDs, especially among the most vulnerable social strata[37].

Some limitations of the study should be considered, such as the impossibility of establishing a causal relationship, as this is a cross-sectional study. Because the 2019 PNS collects self-reported information, data may be subject to information bias. It is possible that the prevalence of some diseases is underestimated due to memory issues, the informant's ignorance or lack of medical diagnosis of the disease. The accuracy in measuring NCDs may

differ according to the type of morbidity, with greater validity of information on diseases that require greater control. The informant's social characteristics can also impact the information[44]. Thus, results must be interpreted cautiously. However, it is noteworthy that the study was carried out in a representative sample of Brazilian adults, and the generalization of the results is safe for national estimates. The study also values high methodological rigor in the various stages of conduction and was carried out with a database that allows adjustments for potential confounding.

Results showed that about half of the Brazilian adult population reports a diagnosis of some NCD and evidenced that there are socioeconomic inequalities related to the prevalence of these diseases and, above all, to their limitations. Greater magnitude of prevalence of NCDs occurred among individuals with black or brown race/color, illiterate, with incomplete elementary/middle education, who do not have private health insurance and with lower income.

Although access to diagnosis can increase the prevalence of NCDs in the most advantaged population, this study detected significant associations that disadvantage the most vulnerable population. Expanding access is important to reduce inequalities in the treatment and control of NCDs in this population. Furthermore, improving the quality of health promotion services is essential for this reduction. Thus, the expansion of SUS needs to increasingly focus on the prevention and control of NCDs, with special attention to the impact of morbidities on individuals' daily activities. Strategies to prevent risk factors must be reinforced and continued, especially in primary care. The limitations were more frequent in the most vulnerable population and reinforce the importance of intersectoral actions to deal with NCDs. PNS data contribute to the identification of inequities and support public policies to overcome them. The importance of SUS in accessing health services and the opportunity for diagnosis and treatment of the most vulnerable populations is also highlighted.

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