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Prevalence of chronic non-communicable diseases and association with self-rated health: National Health Survey, 2013

Prevalência de doenças crônicas não transmissíveis e associação com autoavaliação de saúde: Pesquisa Nacional de Saúde, 2013

Mariza Miranda Theme Filha[I], Paulo Roberto Borges de Souza Junior[II], Giseli Nogueira Damacena[II], Celia Landmann Szwarcwald[II]

ABSTRACT: ***Objective:*** To analyze the profile of 10 chronic noncommunicable diseases investigated in the National Health Survey carried out in Brazil in 2013 and their association with the self-rated health. ***Methods:*** A cross-sectional, population-based nationwide study with 60,202 individuals aged 18 years old or more. Sampling process by conglomerate was carried out in three stages of selection: census tract, household, and individual. The prevalence of chronic diseases by age, gender and educational status and the confidence intervals of 95% , the mean age at the first diagnosis and the proportion of limitation of the usual activities were calculated. To test the association with self-rated health, the logistic regression procedure adjusted for gender and age was used. ***Results:*** The more prevalent diseases were hypertension (21.4%), depression (7.6%), arthritis (6.4%), and diabetes mellitus (6.2%). Individuals diagnosed with stroke reported greater limitations in the daily activities (38.6%). There was a gradient in the prevalence by age and educational level, and all the diseases were more frequent among women. A worse self-rated health was observed among those with a diagnosis of stroke (OR = 3.60; $p < 0.001$) and those who referred two diseases (OR = 5.53; $p < 0.001$) or three or more diseases (OR = 10.86; $p < 0.001$). ***Conclusions:*** Because these diseases are associated with modifiable risk factors, the prevention with population focus is the best strategy to reduce the burden of these diseases.

Keywords: Chronic disease. Self-assessment. Cross-sectional studies. Health surveys. Epidemiology. Brazil.

[I]National School of Public Health, *Fundação Oswaldo Cruz* – Rio de Janeiro (RJ), Brazil.

[II]Institute of Scientific and Technological Communication and Information in Health, *Fundação Oswaldo Cruz* – Rio de Janeiro (RJ), Brazil.

Corresponding author: Mariza Miranda Theme Filha. Rua Leopoldo Bulhões, 1480, sala 813, Manguinhos, CEP: 21241-210, Rio de Janeiro, RJ, Brasil. E-mail: marizatheme@hotmail.com

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RESUMO: ***Objetivo:*** Analisar o perfil de dez doenças crônicas não transmissíveis investigadas na Pesquisa Nacional de Saúde realizada no Brasil em 2013 e sua associação com a auto-avaliação da saúde. ***Métodos:*** Estudo transversal de base populacional e abrangência nacional com 60.202 indivíduos com 18 anos ou mais. Foi utilizado processo amostral por conglomerado com três estágios de seleção: setor censitário, domicílio e indivíduo. Calculou-se a prevalência das doenças crônicas e os intervalos de confiança de 95% por idade, sexo e escolaridade, a idade média do primeiro diagnóstico e a proporção de limitação das atividades habituais. Para testar a associação com a auto-avaliação de saúde, utilizou-se o procedimento de regressão logística ajustada por sexo e idade. ***Resultados:*** As doenças mais prevalentes foram hipertensão arterial (21,4%), depressão (7,6%), artrite (6,4%) e diabetes mellitus (6,2%). Indivíduos com diagnóstico de acidente vascular cerebral (AVC) referiram maior limitação das atividades habituais (38,6%). Observou-se um gradiente na prevalência segundo idade e escolaridade, e todas as doenças foram mais frequentes entre as mulheres. Pior auto-avaliação de saúde foi encontrada entre aqueles com diagnóstico de AVC (OR = 3,60; valor de $p < 0,001$) e nos que referiram duas doenças (OR = 5,53; valor de $p < 0,001$) ou três ou mais doenças (OR = 10,86; valor de $p < 0,001$). ***Conclusões:*** Por se tratar de doenças associadas a fatores de risco modificáveis, a prevenção com foco populacional é a melhor estratégia para redução da carga dessas doenças.

Palavras-chave: Doença crônica. Autoavaliação. Estudos transversais. Inquéritos epidemiológicos. Epidemiologia. Brasil.

INTRODUCTION

The World Health Organization (WHO) defines cerebrovascular diseases, cardiovascular diseases, diabetes mellitus, obstructive respiratory diseases, asthma, and neoplasms, which share several risk factors, as chronic noncommunicable diseases (CNCD). It also includes in the list of chronic conditions the mental and neurological disorders; the bone and joint diseases; the mouth, eye and hearing diseases; osteoporosis; and genetic disorders. Those are diseases that have long latency periods and prolonged course, which poses a great challenge for the public health[1].

Since 1980, the Global Burden of Disease study has provided comprehensive estimates on the burden of 235 causes of death and 67 different risk factors in 21 regions of the world. The CNCDs are the most prevalent and account for most morbidity and mortality in world[2]. The WHO report on CNCDs published in 2011 pointed to these illnesses as the leading causes of death, surpassing together all the other causes and particularly affecting the countries of medium and low incomes[3].

In Brazil, the study published on the global burden of disease (GBD) with data for 1998 showed that 59% of the years of life lost due to premature death and 74.7% of the years lived with disability were represented by the group of the CNCD[4].

Owing to their chronic and often recurring nature, the CNCDs have a strong association with self-rated health. This is an indicator widely used in health surveys and considered a strong predictor of both morbidity and mortality, even when controlled by the presence of disease or disability. While it is measured using a single question, the self-rated health

covers various dimensions of health, in an implicit ponderation process of these dimensions, suggesting that the feeling of well-being extrapolates the presence of objective conditions, although it has well-established relationships with clinical conditions and the morbidity and mortality indicators[5].

In addition, the chronic course causes different degrees of limitation in usual activities that increase with the age. The evaluation of the degree of limitation as a result of CNCDs is also widely used in the health surveys. In addition to the self-rated health, the perception of the degree of limitation is easily questioned using a single question and has a high degree of concordance with the clinical evaluation. While the self-rated health is a global measure of health, the perception of limitations and disabilities is linked to the individual clinical conditions[5].

Monitoring the prevalence of CNCDs, the related risk factors, the presence of limitations and disabilities, and questioning about the self-rated health enable us to obtain key indicators to define health policies aimed at the prevention and control of these illnesses.

The objective of this research is to present the prevalence of some chronic diseases and the degree of limitation imposed by these illnesses investigated in the National Health Survey (PNS) of 2013 and to analyze its association with the self-rated health.

METHODS

The sample of the PNS is a subsample of the census tracts of the Geographic Operational Base of the 2010 Population Census, except for those with very small number of households and the special sectors. The conglomerate sampling process was carried out in three stages with the stratification of the primary sampling units (PSUs). The census tracts or set of sectors formed the PSUs, the households were the second stage units, and residents aged 18 years or more defined the units of the third stage. We selected 62,986 households, and 60,202 individuals responded to the individual interview. A responsible person in the selected household responded to the household questionnaire about all the residents, and an adult resident, randomly selected, responded to the individual interview. Because it is a complex sample, it was defined sample weights for the PSUs, for the households and all their inhabitants, and for the selected resident. More details about sampling and data collection can be found in the National Health Survey 2013 Report, published by the Brazilian Institute of Geography and Statistics (IBGE)[6].

The variables related to 10 CNCDs [hypertension, diabetes mellitus, heart disease, cerebrovascular accident (CVA)/stroke, asthma, arthritis, work-related musculoskeletal disorders (WMSDs), depression, cancer, and chronic renal failure) and the self-rated health among the carriers of these diseases were considered. For the evaluation of the chronic diseases, the individual selected in the household was asked:

1. "Has any doctor given you the diagnosis of (*disease*)?";
2. "How old were you at the first diagnosis of (*disease*)?";
3. "In general, to what degree does (*disease*) limit your usual activities?".

We considered individuals with chronic diseases those who answered affirmatively to the presence of at least one of the investigated diseases. A person could be affected by more than one chronic disease, and the presence of multimorbidities was analyzed considering the positive response to the diagnosis of two and three or more diseases.

The limitation of usual activities variable had five options: no limits; a little; moderately; severely; and very severely. In the analysis of the percentage of limitation caused by the disease, the options moderately, severely, and very severely were aggregated. In particular, for the limitation related to asthma, it was only asked to those that reported crisis in the last 12 months.

The self-rated health was assessed through the question ("In general, how do you evaluate your health?"), with five alternatives of answer: very good, good, moderate, poor, or very poor. In the analysis, the self-rated health variable was grouped into two categories: "good" (very good, good, and regular) and "poor" (poor or very poor).

The individuals diagnosed with one of the ten diseases investigated were analyzed according to age group, gender and years of schooling. For the variables age and gender, the proportional distributions and confidence intervals of 95% (95%CI) were calculated. Given that the chronic diseases are strongly associated with age and gender, to test the differences in prevalence according to educational status, we used the multiple logistic regression model adjusted for these two variables. The same procedure was adopted to compare the proportion of poor self-rated health among the individuals with chronic diseases, having as a reference the good self-rated health.

The PNS project was approved by the National Research Ethics Commission (Conep), in June 2013, taking into account all the recommendations of the resolution 466/2012 of the National Health Council (NHC). The authors deny any conflict of interest.

RESULTS

Among the individuals who responded to the individual interview, 52% were women, 36.7%, between 18 and 34 years; 44.4%, between 35 and 59 years; and 18%, 60 years or older. As for the educational status, 38.7% had less than 8 years of schooling; 43.6%, between 8 and 11 years; and 17.5%, 12 years or more. Regarding the presence of the 10 CNCDs under analysis in this article, 62.7% reported no disease, 22.9% reported 1 disease, and 14.4% multimorbidities (9.2% with 2 diseases and 5.2% with 3 or more diseases). The poor self-rated health was reported by 33.9% of respondents.

The more prevalent diseases were hypertension (21.4%; 95%CI: 20.8 – 22.0), followed by depression (7.6%) and diabetes mellitus (6.2%). The highest mean age at the first diagnosis was among individuals who experienced stroke (53 years) and cancer (52 years). WMSDs and depression showed a mean age of diagnosis between 30 and 39 years, and hypertension, diabetes mellitus, heart disease, arthritis, and chronic renal failure were in

the range of 40 – 49 years. The diagnosis of asthma was the one that happened earlier in life, on average at 18 years. The reference to moderate-to-intense limitation of usual activities was higher for diseases that affect the individuals later, such as stroke (38.6%) and arthritis (34.9%) (Table 1).

The distribution by age group reveals a significant gradient with the increasing age, except for asthma. Hypertension and diabetes mellitus were more prevalent among individuals aged 60 years or more (50.6 and 18.1%, respectively). The prevalence of depression was similar in the age groups of 35 – 59 years (9.3%) and 60 years or more (9.5%). The proportion of WMSDs was higher in the group of 35 – 59 years (3.3%), reducing with an increasing age. The occurrence of 2 simultaneous diseases was 3.3 times higher among the individuals who were 35 – 59 years old and 5.6 times higher among those aged 60 years or older, using as a reference the age group of 18 – 34 years. The prevalence of three simultaneous diseases in the age group of 60 years or more was 3.7 times the prevalence of the group of 35 – 59 years and almost 20 times compared with those between 18 and 34 years old (Table 2).

Hypertension was the most frequent disease in both the genders (18.3% among the men and 24.2% among the women). No statistically significant differences by gender were

Table 1. Prevalence of diagnosis of selected chronic noncommunicable diseases among individuals aged 18 years or older by mean age at the first diagnosis and limitation of usual activities owing to the disease: PNS, Brazil, 2013.

Disease	Total sample (n)	Individuals with diagnosis		Mean age of the individual at the first diagnosis	% with limitation of the usual activities*
		%	95%CI		
Hypertension	12,885	21.4	20.8 – 22.0	44	12.1
Diabetes mellitus	3,753	6.2	5.9 – 6.6	49	16.0
Heart disease	2,516	4.2	3.9 – 4.5	45	27.0
CVA	918	1.5	1.4 – 1.7	53	38.6
Asthma	2,649	4.4	4.1 – 4.7	18	35.5**
Arthritis	3,860	6.4	6.1 – 6.7	43	34.9
WMSD	1,468	2.4	2.2 – 2.7	36	30.3
Depression	4,600	7.6	7.2 – 8.1	36	23.1
Cancer	1,103	1.8	1.6 – 2.0	52	19.5
Chronic renal failure	856	1.4	1.3 – 1.6	40	20.9

95%CI: confidence interval of 95%; CVA: cerebrovascular accident/stroke; WMSD: work-related musculoskeletal disorders; *moderate/severe/very severe limitation; **only for individuals who reported crisis in the last 12 months.

Table 2. Prevalence of diagnosis of selected chronic noncommunicable diseases among individuals aged 18 years or older by age group: PNS, Brazil, 2013.

Disease	%	95%CI	p-value
Hypertension			
18 – 34 years	4.2	3.8 – 4.6	< 0.001
35 – 59 years	24.1	23.1 – 25.0	
60 years or more	50.6	48.9 – 52.4	
Diabetes mellitus			
18 – 34 years	0.7	0.5 – 0.9	< 0.001
35 – 59 years	6.1	5.6 – 6.7	
60 years or more	18.1	16.9 – 19.4	
Heart disease			
18 – 34 years	1.0	0.8 – 1.3	< 0.001
35 – 59 years	3.9	3.5 – 4.4	
60 years or more	11.4	10.3 – 12.7	
CVA			
18 – 34 years	0.1	0.1 – 0.2	<0.001
35 – 59 years	1.3	1.1 – 1.6	
60 years or more	4.9	4.3 – 5.7	
Asthma			
18 – 34 years	4.6	4.2 – 5.1	0.092
35 – 59 years	4.1	3.7 – 4.5	
60 years or more	4.8	4.1 – 5.5	
Arthritis			
18 – 34 years	1.4	1.2 – 1.8	< 0.001
35 – 59 years	6.5	6.1 – 7.1	
60 years or more	16.4	15.3 – 17.7	
WMSD			
18 – 34 years	1.9	1.5 – 2.3	< 0.001
35 – 59 years	3.3	3.0 – 3.8	
60 years or more	1.4	1.0 – 2.0	
Depression			
18 – 34 years	4.8	4.2 – 5.3	< 0.001
35 – 59 years	9.3	8.7 – 10.0	
60 years or more	9.5	8.6 – 10.6	
Cancer			
18 – 34 years	0.4	0.2 – 0.6	< 0.001
35 – 59 years	1.6	1.3 – 1.8	
60 years or more	5.6	4.9 – 6.4	

Continue...

Table 2. Continuation.

Disease	%	95%CI	p-value
Chronic renal failure			
18 – 34 years	0.6	0.5 – 0.8	< 0.001
35 – 59 years	1.6	1.3 – 1.8	
60 years or more	2.8	2.3 – 3.4	
One disease			
18 – 34 years	18.9	17.9 – 20.0	< 0.001
35 – 59 years	37.1	36.0 – 38.3	
60 years or more	54.1	51.9 – 56.2	
Two diseases			
18 – 34 years	4.9	4.3 – 5.6	
35 – 59 years	20.8	19.6 – 22.0	
60 years or more	47.1	44.7 – 49.5	
Three or more diseases			
18 – 34 years	1.1	0.9 – 1.4	
35 – 59 years	9.2	8.5 – 10.1	
60 years or more	33.2	30.7 – 35.9	

95%CI: confidence interval of 95%; CVA: cerebrovascular accident/stroke; WMSD: work-related musculoskeletal disorders.

observed for heart diseases, stroke, and chronic renal failure. All the other diseases under analysis were significantly more prevalent among women, including the presence of multimorbidities (two diseases and three or more diseases) (Table 3).

Except for asthma and WMSDs, all the diseases showed an inverse relationship with the educational status. After the adjustment for age and gender, there was a decrease in the strength of the association and loss of statistical significance for some diseases. Only stroke and arthritis maintained the inverse and significant gradient with the educational level. On the other hand, the diagnosis of cancer and WMSDs showed a direct and statistically significant association with a higher level of education. Individuals with hypertension, diabetes, and chronic renal failure showed a higher probability of experiencing the disease only among those with less than eight years of schooling (Table 4).

All the diseases were strongly associated with poor self-rated health in the unadjusted analysis, except for WMSDs. Despite the reduction in the strength of the association, the behavior remained virtually unchanged in the analysis adjusted by age and gender, with only the association between self-rated health among carriers of any of the analyzed diseases ("one disease" category) losing statistical significance. Individuals diagnosed with stroke, depression, and three or more diseases simultaneously were more than three times more likely to have poor self-rated health in relation to the good self-rated health (Table 5).

Table 3. Prevalence of diagnosis of selected chronic noncommunicable diseases among individuals aged 18 years or older by gender: PNS, Brazil, 2013.

Disease	%	95%CI	p-value
Hypertension			
Male	18.3	17.5 – 19.1	< 0.001
Female	24.2	23.4 – 24.9	
Diabetes mellitus			
Male	5.4	4.8 – 5.9	< 0.001
Female	7.0	6.5 – 7.5	
Heart disease			
Male	3.9	3.5 – 4.4	0.115
Female	4.4	4.0 – 4.8	
CVA			
Male	1.6	1.3 – 1.9	0.314
Female	1.4	1.2 – 1.6	
Asthma			
Male	3.6	3.2 – 4.0	< 0.001
Female	5.1	4.7 – 5.5	
Arthritis			
Male	3.5	3.1 – 3.9	< 0.001
Female	9.0	8.5 – 9.6	
WMSD			
Male	1.5	1.2 – 1.8	< 0.001
Female	3.3	2.9 – 3.7	
Depression			
Male	3.9	3.5 – 4.4	< 0.001
Female	10.9	10.3 – 11.6	
Cancer			
Male	1.6	1.3 – 1.9	0.028
Female	2.0	1.8 – 2.3	
Chronic renal failure			
Male	1.4	1.1 – 1.6	0.426
Female	1.5	1.3 – 1.7	
One disease			
Male	27.9	26.9 – 28.9	< 0.001
Female	34.5	33.5 – 35.6	
Two diseases			
Male	13.4	12.6 – 14.3	
Female	20.6	19.7 – 21.5	
Three or more diseases			
Male	5.3	4.7 – 6.0	
Female	10.8	10.0 – 11.7	

95%CI: confidence interval of 95%; CVA: cerebrovascular accident/stroke; WMSD: work-related musculoskeletal disorders.

Table 4. Prevalence of diagnosis of selected chronic noncommunicable diseases among individuals aged 18 years or older by educational status and odds ratio adjusted for age and gender: PNS, Brazil, 2013.

Disease	% with diagnosis	Crude OR	p-value	OR adjusted	p-value
Hypertension					
< 8	31.1	2.63	< 0.001	1.27	< 0.001
8 – 11 years	16.7	1.16	0.012	1.05	0.460
12 years or more	14.7	1		1	
Diabetes					
< 8	9.6	2.81	< 0.001	1.48	< 0.001
8 – 11 years	5.4	1.50	< 0.001	1.26	0.052
12 years or more	3.6	1		1	
Heart disease					
< 8	6.3	2.38	< 0.001	1.14	0.349
8 – 11 years	3.1	1.12	0.417	0.95	0.734
12 years or more	2.7	1		1	
CVA					
< 8	2.7	3.83	< 0.001	2.58	< 0.001
8 – 11 years	0.8	1.13	0.558	2.23	< 0.001
12 years or more	0.7	1		1	
Asthma					
< 8	4.1	0.74	0.057	0.81	0.023
8 – 11 years	4.4	0.76	0.574	0.85	0.106
12 years or more	4.7	1		1	
Arthritis					
< 8	9.3	2.27	< 0.001	1.39	0.002
8 – 11 years	5.5	1.30	0.005	1.28	0.028
12 years or more	4.3	1		1	
WMSD					
< 8	2.0	0.66	< 0.001	0.57	< 0.001
8 – 11 years	1.9	0.63	< 0.001	0.69	0.005
12 years or more	3.0	1		1	
Depression					
< 8	8.6	1.24	< 0.001	0.94	0.433
8 – 11 years	6.9	0.99	0.886	0.81	0.014
12 years or more	7.0	1		1	
Cancer					
< 8	2.3	1.39	0.004	0.42	< 0.001
8 – 11 years	1.1	0.66	0.013	0.57	< 0.001
12 years or more	1.7	1		1	

Continue...

Table 4. Continuation.

Disease	% with diagnosis	Crude OR	p-value	OR adjusted	p-value
Chronic renal failure					
< 8	2.1	2.21	< 0.001	1.65	0.006
8 – 11 years	1.2	1.22	0.230	1.22	0.322
12 years or more	1.0	1		1	
One disease					
< 8	34.8	1.46	< 0.001	1.12	0.024
8 – 11 years	26.9	0.88	0.009	1.01	0.804
12 years or more	28.4	1		1	
Two diseases					
< 8	25.2	1.78	< 0.001	1.09	0.280
8 – 11 years	11.9	0.70	< 0.001	0.89	0.169
12 years or more	14.5	1		1	
Three or more diseases					
< 8	13.8	3.06	< 0.001	1.56	< 0.001
8 – 11 years	5.0	0.86	0.153	1.15	0.194
12 years or more	5.4	1		1	

OR: odds ratio; CVA: cerebrovascular accident/stroke; WMSD: work-related musculoskeletal disorders.

DISCUSSION

The results of this study suggest the importance of CNCDs in the illness profile of the Brazilian population, and the comparison with previous studies reveals the consolidation of our epidemiological transition. An analysis of the World Health Survey carried out in Brazil in 2003 had already shown the high prevalence of six CNCDs (arthritis, angina, asthma, depression, schizophrenia, and diabetes) being higher among women, for most of the analyzed diseases, and worse self-rated health compared with those individuals with no disease[7]. Data from the National Household Sample Survey (PNAD) of 2008 showed that the chronic diseases identified by a doctor or health-care professional most often reported were hypertension (14%), spine disorders (13.5%), arthritis or rheumatism (5.7%), bronchitis or asthma (5%), depression (4.1%), heart disease (4%), and diabetes (3.6%). With the increasing age, the number of diseases reported by the people also increased[8]. In this study, spinal disorders also showed a high prevalence in the population (18.5%), although, unlike PNAD, the information was obtained without reference to the medical diagnosis.

In the analysis of the PNS data, the high proportion of hypertension and its differential by gender and age were very close to the data obtained by the Surveillance of Risk and Protective Factors for Chronic Diseases by Telephone Interviews (Vigitel)[9], where the standardized prevalence by gender and age among adults aged 18 years and older was 23.1%, 25.5% among women and 20.3% among men. In addition, similar to our results, a gradient

Table 5. Prevalence of poor self-rated health among individuals aged 18 years or older with diagnosis of selected chronic noncommunicable disease and odds ratio adjusted for age and gender: PHS, Brazil, 2013.

Disease	% of "poor" HSA	Crude OR	p-value	OR adjusted	p-value
Hypertension					
Yes	13.0	3.71	< 0.001	2.23	< 0.001
No	3.9	1		1	
Diabetes					
Yes	17.8	4.10	< 0.001	2.34	< 0.001
No	5.0	1		1	
Heart disease					
Yes	18.5	4.09	< 0.001	2.50	< 0.001
No	5.3	1		1	
CVA					
Yes	27.5	6.54	< 0.001	3.60	< 0.001
No	5.5	1		1	
Asthma					
Yes	9.9	1.83	< 0.001	1.86	< 0.001
No	5.6	1		1	
Asthma					
Yes	19.9	4.88	< 0.001	2.94	< 0.001
No	4.9	1		1	
WMSD					
Yes	7.2	1.26	0.129	1.28	0.119
No	5.8	1		1	
Depression					
Yes	15.9	3.59	< 0.001	3.14	< 0.001
No	5.0	1		1	
Cancer					
Yes	16.6	3.35	< 0.001	1.86	< 0.001
No	5.6	1		1	
Chronic renal failure					
Yes	18.8	3.87	< 0.001	2.80	< 0.001
No	5.6	1		1	
One disease					
Yes	6.4	3.72	< 0.001	3.09	< 0.001
No	5.6	1		1	
Two diseases					
Yes	12.2	7.53	< 0.001	5.53	< 0.001
No	5.0	1		1	
Three or more diseases					
Yes	23.1	16.34	< 0.001	10.86	< 0.001
No	4.3	1		1	

HSA: health self-assessment; OR: odds ratio; CVA: cerebrovascular accident/stroke; WMSD: work-related musculoskeletal disorders.

in the prevalence with the age was observed, reaching, at the age group of 65 years or more, values between 48.2 and 66.2%. The same profile was found in the study carried out in São Paulo, with reference to the diagnosis of hypertension by 46.9% of individuals aged 60 or older, with a higher prevalence among women, those with educational status of uncompleted elementary school, and those who rated their health as poor or very poor, considering as a reference the assessment excellent/very good[10].

Regarding heart disease, it ranked sixth, behind hypertension and diabetes mellitus, diseases that share the same risk factors and often occur together. The association of hypertension and diabetes was investigated in a study with PNAD data, showing that the standardized prevalence of diabetes alone increased from 2.9% in 1998 to 4.3% in 2008, while its association with hypertension increased from 1.7 to 2.8%. Although the results presented by PNAD were lower than those found in the PNS (prevalence of diabetes of 6.2%), in both the studies, the pattern of higher prevalence among women and increase with age was maintained[11].

Among the cardiovascular diseases investigated in the PNS (hypertension, heart disease, and stroke), stroke was the one that showed the highest proportion of poor self-rated health and of limitation of usual activities. The observed pattern was very similar to the one found in the United States, which showed a prevalence adjusted for age of 2.6%, with great differences according to gender and educational status[12]. Similarly, the data obtained from the Framingham study shows that about 50% of the survivors revealed a disability related to the disease with impairment ranging from moderate to severe[13]. Although the prevalence of the disease increases with age, a stroke may occur at any stage of life. In our data, 1.3% of the cases were in the range of 35 to 59 years old. Its occurrence among younger people has disproportionately greater economic impact, causing disability during the most productive years of life.

The observation in this study that asthma equally affects all age groups and is accompanied by a high degree of activity limitation among those that reported crisis in the last 12 months reflects the natural history of the disease. Asthma affects people of all ages, and more recent estimates suggest that about 334 million people worldwide experience the disease; its prevalence among various age groups is quite variable. Data from the WHO's World Health Survey carried out between 2002 and 2003 revealed a prevalence of 4.3% of physician-diagnosed asthma in the age group of 18 – 45 years[14]. The burden of the disease, measured by disability and premature death, is higher among adolescents (10 – 14 years) and the elderly people (75 – 79 years), showing less impact among young adults (30 – 34 years). However, the disability component predominates among the younger, with direct impact on quality of life and in the productive years[15]. Data from the Behavioral Risk Factor Surveillance System (BRFSS) from 2006 to 2009 carried out in the United States estimated at 8.4% the prevalence of asthma among adults (twice the prevalence found in the PNS), being lower among individuals aged older than 65 years (7.6% among the women and 6.3% among the men)[16].

The importance of depression, which showed a high prevalence among the women and has equally affected the population of 35–59 years old and 60 years old or more, had already been emphasized in previous investigations, showing that it is, in some countries, equally or more prevalent than other chronic diseases such as arthritis, diabetes, and heart diseases. Furthermore, it is often associated with these diseases. Individuals with depression reveal

a higher risk of developing cardiovascular diseases (especially, ischemic heart disease) and type 2 diabetes and show a strong association with arthritis[17-19].

The presence of multimorbidities is a key issue when one analyzes the chronic diseases. There are clearly interrelationships between them, and the occurrence of various diseases together is associated with the worsening of the self-rated health. A study on the incidence of lung, breast, and colorectal cancers showed that these types of cancer occur with certain frequency in individuals with diabetes and cardiovascular disease, and the concomitant presence of the cancer with these diseases is associated with the negative perception of the health status and the reduced longevity[20]. The same behavior was observed regarding poor control of hypertension and its association with cardiovascular diseases and the development of chronic renal failure. In addition, in this case, the simultaneous presence of these diseases correlated with a worse health evaluation[21].

In response to the persistent increase in the CNCDs, the Ministry of Health has invested in several consistent policies for controlling them, culminating in the preparation of the Strategic Action Plan to Combat Chronic Noncommunicable Disease in Brazil in 2011. The plan projects for the next 10 years the development and implementation of effective, integrated, sustainable, and based on scientific evidence public policies for the prevention and control of CNCDs, including stroke, myocardial infarction, hypertension, cancer, diabetes, and chronic respiratory diseases and their risk factors, considering three strategic areas: surveillance, information, evaluation, and monitoring; health promotion; and comprehensive care[22].

Given the complex determination of the health–disease process, we believe that these initiatives possess a good chance of success by reaching the entire population. However, we emphasize that these actions should be sustained and maintained over time. In addition, the burden of the CNCDs can be considerably reduced in the short and medium terms if the population approach is complemented by interventions aimed at high-risk individuals and supported by guaranteed access to timely and quality health services.

CONCLUSIONS

Several factors are implicated in the growing burden of the CNCDs, including the increase in life expectancy, tobacco use, insufficient physical activity, and increased consumption of unhealthy foods. About 80% of premature deaths from heart disease, stroke, and diabetes could be prevented by changes in behavior and pharmacological treatment[23]. Thus, the great impact of CNCDs on the Brazilian population requires effective preventive measures and actions at the population level and timely offer of health care in order to change this situation. Some preventive measures aimed at reducing CNCDs have rapid impact in reducing the global burden of these diseases, particularly when instituted collectively, and prove cost-effective, even in low-income countries. In this context, the PNS adds greater knowledge about the main causes of illness in the country and provides support for interventions that lead to reducing the incidence of these diseases and their associated disability, diminishing the huge burden on the health of the population and the financial costs on the health systems.

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