

Ideal cardiovascular health prevalence in the Brazilian population – National Health Survey (2013)

Prevalência de saúde cardiovascular ideal na população brasileira – Pesquisa Nacional de Saúde (2013)

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ABSTRACT: Primordial prevention is defined as the initial prevention of risk factors, through the adoption of healthier behaviors. Within this concept, the American Heart Association (AHA) has defined seven metrics, based on evidence, to achieve ideal cardiovascular health. The aim of this study was to evaluate the prevalence of cardiovascular health in the Brazilian population, according to sex, age, and region of residence, using data from the latest National Health Survey (2013). We assessed the risk factors, as recommended by the AHA, combined (number of factors) and individually: four behavioral (smoking, physical activity, body mass index and diet) and three biological factors (blood pressure, blood glucose and cholesterol levels). The Brazilian population has reached very low prevalence (1%), for the sum of 7 factors in ideal level. Individually, 3.2% of the population consumed ideal diet, followed by physical activity (23.6%) and body mass index (43.7%). The subjects aged between 18 and 35 years showed higher prevalence of metrics combined at the optimal levels (0.5%), which was also reached by the population of the Northern region. These results indicate that greater efforts are urgent by public policies at the level of primordial prevention in order to achieve appropriate targets of cardiovascular health in the Brazilian population.

Keywords: Cardiovascular diseases. Disease prevention. Health promotion. Risk factors. Epidemiology. Prevalence.

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RESUMO: A prevenção primordial é definida como a prevenção inicial de fatores de risco, por meio da adoção de comportamentos mais saudáveis. Dentro desse conceito, a *American Heart Association* (AHA) definiu sete métricas, baseadas em evidências, para se alcançar uma saúde cardiovascular (SCV) ideal. O objetivo deste trabalho foi avaliar a prevalência de SCV na população brasileira, segundo sexo, faixa etária e região de moradia, utilizando os dados da última Pesquisa Nacional de Saúde (PNS), de 2013. Foram avaliados, como preconizado pela AHA, de forma conjunta (número de fatores) e isolada, quatro fatores comportamentais (tabagismo, atividade física, índice de massa corporal e dieta) e três biológicos (pressão arterial, glicemia e níveis de colesterol). A população brasileira atingiu prevalências menores de 1%, de sete fatores em nível ideal. Isoladamente, 3,2% da população apresentaram a dieta em nível ideal, seguido da atividade física (23,6%) e índice de massa corporal (43,7%). A população entre 18 e 35 anos apresentou a maior prevalência de número de métricas conjuntas em nível ideal (0,5%), valor também atingido pela população geral da Região Norte. Os resultados indicam que devem ser realizados ainda maiores esforços por meio de políticas públicas de prevenção primordial para atingir metas adequadas de SCV na população brasileira.

Palavras-chave: Doenças cardiovasculares. Prevenção de doenças. Promoção da saúde. Fatores de risco. Epidemiologia. Prevalência.

INTRODUCTION

Despite the decreasing mortality rates caused by cardiovascular diseases (CVDs) verified in Brazil from 2000 to 2011¹, the CVDs are still among the main causes of death in the country¹. A similar reality is observed in high-, low-, and medium-income countries^{2,3}.

In this context, in 2010, the American Heart Association (AHA)⁴ came up with the concept of ideal cardiovascular health (CVH), with the objective of improving the CVH of the American population and of reducing the mortality caused by CVD in 20% until 2020. This concept is based on primordial prevention and includes four behavioral factors — smoking, physical activity, body mass index (BMI), and diet — and three biological factors — blood pressure, blood glucose, and cholesterol levels⁴.

The reach of the higher number of factors for ideal CVH is associated with significant synergetic effects on the reduction of CVD incidence and population mortality⁵⁻⁸. Studies involving different populations have shown that the adherence to 6 of the proposed metrics at an ideal level is associated with a 51% reduction in the incidence of cancer⁸, 80% in the incidence of CVD⁹, 51% in mortality for all causes¹⁰, 76% in mortality for CVD¹⁰, and 70% in mortality caused by ischemic heart disease¹⁰, when compared with the presence of 0 and 1 metric at an ideal level.

Unlike the prevention of the development of a disease, the primordial prevention is conceived as the initial prevention of risk factors by adopting healthier behaviors, which has been suggested as being essential to reach CVH and to reduce the high mortality rates caused by CVDs⁴. In this context, knowing the CVH situation of a population is essential

to create efficient public policies, and national surveys can be useful surveillance tools that lead to population diagnoses.

In Brazil, for our awareness, studies that assess the CVH of the national population using criteria from the AHA have been published in a population restricted to the rural area¹¹. This concept is believed to be very useful to encourage that ideal goals can be reached, consequently improving the CVH of the population. Therefore, the objective of this study was to assess the prevalence of the ideal CVH in the Brazilian population according to gender, age group, and region of household, using the data from the last National Health Survey (PNS), 2013.

METHODS

This is a population-based cross-sectional study that used data from the PNS, 2013. PNS is a result of a partnership between the Ministry of Health and the Brazilian Institute of Geography and Statistics (IBGE), which collected information regarding health status perception, lifestyles, and chronic noncommunicable diseases (CNCD) in private households around the country. The sample of PNS was based on the sample of the National Household Sample Survey (PNAD), increasing its geographic range and improving the accuracy for specific indicators, selected in 3 stages: census tract, households, and inhabitants aged 18 years old or more. Other data about the sample and data collection for PNS are described in a specific publication¹².

Of the 64,308 adults interviewed (18 years or older), 60,202 responded to the modules regarding lifestyle and medical diagnosis of CNCD, self-reported. This loss (about 6.5%) refers to refusals and inhabitants that were not present in the household. Besides, for this study, pregnant women ($n = 800$; 1.24%), the ones who did not know if they were pregnant ($n = 176$; 0.27%), and those who did not answer all of the 7 factors assessed ($n = 25,840$; 40.18%) were excluded, thereby accounting for a sample of 34,362 individuals.

The prevalence of ideal CVH in the population of this study was assessed according to that proposed by AHA⁴, based on self-reported behavioral (smoking, BMI, physical activity, and diet) and biological factors (diagnosis of dyslipidemia, diabetes, and arterial hypertension).

The diet was assessed with four of the five criteria in the original proposal:

1. Regular intake of fruits and vegetables (at least five times per day, at least five times per week), based on the questions: "On how many days of the week do you usually eat lettuce and tomato or any other salad containing greens or raw vegetables?" and "In general, how many times a day do you eat this type of salad: once, twice or three times or more?"; "On how many days of the week do you usually eat greens or cooked vegetables with the food or in a soup, for instance, cabbage, carrot, chayote, eggplant, zucchini, not to mention potato, manioc or yam?" and "In general, how many times per day do you eat cooked greens or vegetables: once, twice, or three times or more?"; "On how many days of the week do you usually drink fruit juices?"

- and “In general, how many times per day do you drink fruit juices?”; and “On how many days of the week do you usually eat fruit?”, and “In general, how many times per day do you eat fruit: once, twice, or three times or more?”;
2. Consumption of fish (twice per week), based on the question: “On how many days of the week do you usually eat fish?”;
 3. Intake of sugar-sweetened soft drinks and drinks (less than 5 glasses per week), based on the questions: “On how many days of the week do you usually drink soft drinks (or artificial juice)?” and “In general, how many glasses of soft drinks (or artificial juice) do you take per day: one, two, three or more?”;
 4. Adequate intake of salt (adequate, low, and very low), based on the question: “By considering fresh food and industrialized food, do you think your salt consumption is: very high, high, adequate, low, very low?”.

The intake of whole grains was not assessed, because it was not measured in PNS, 2013. For each one of these items at an ideal level, the person got 1 point or 0 for the opposite. After adding these diet components, individuals were classified in three groups, according to the number of ideal criteria presented: poor (0–1), intermediate (2–3), and ideal (4).

Besides the diet, three other behaviors were analyzed, and the ideal levels were considered as follows:

1. Nonsmoking or having stopped smoking for more than 12 months, based on the questions: “When you bought cigarettes for consumption for the last time, how many cigarettes did you buy?”; “In average, how many industrialized cigarettes did you smoke per day or per week?”; and “How long has it been since you stopped smoking?”;
2. Presenting BMI lower than 25 kg/m², based on the questions: “Do you know how much you weight (even if an approximate value)?” and “Do you know your height?”;
3. To perform physical activity at goal levels (>150 minutes per week of moderate physical activity or >75 minutes of vigorous physical activity), based on the questions: “In the past three months, have you practiced any type of physical exercise or sport?”; “What is the main type of physical activity or sport that you have practiced?”; “Do you practice physical exercises at least once a week?”; “How many days of the week do you usually practice physical activities or sports?”; and “On the day you practice exercises or sports, how long does this activity take?”.

Finally, the three biological measurements were assessed similarly, as follows:

1. Not referring diagnosis of dyslipidemia, diabetes, and arterial hypertension, based on the questions: “Has any doctor ever said you have diabetes?”; “Has any doctor ever said that you have high blood pressure?”; and “Has any doctor ever said you have high cholesterol or triglycerides?”.

The score 1 was attributed to each condition at ideal levels and 0 for the opposite (except for the diet component, for which it was necessary that the ideal condition was reached in all of the four assessed situations). At the end, the indicator of CVH ranged from zero (poor) to seven (ideal). An ideal CVH was considered when the individual presented ideal levels for the seven factors. Besides, behavioral and biological measurements were groups originating the behavioral measures index (0 – 4) and the biological measures index (0 – 4), respectively. Despite not being a biological characteristic, smoking was included in both the groups owing to the importance of not smoking and of stopping smoking for health promotion⁴.

The prevalence and 95% confidence interval (95%CI) of the ideal values of isolated variables and behavioral, biological, and total indexes were presented according to gender (male and female), age group (18 – 35, 36 – 59, and 60 years or more), and the region of the country (North, Northeast, Center-west, Southeast, and South). In each of these situations, significant differences were identified by not overlapping 95%CI data of the analyzed prevalence rates. For all of the analyses, an $\alpha = 0.05$ significance level was considered.

All of the analyses were conducted by considering the complex sampling design of PNS 2013, by the Survey module of the application Stata 12.1. PNS was approved by the National Research Ethics Commission (CONEP), from the National Health Council (CNS), in June, 2013, report n. 328.159.

RESULTS

This study included 34,362, being 51.3% female participants, and mean age (\pm EP) of 43.8 years old (± 0.2). Regarding age group, it was observed that 35.8% of the studied population was aged between 18 and 35 years; 46.5%, between 36 and 59 years; and 17.7%, 60 years or older. Besides, 5.5% was residing in the North region; 21.5%, in the Northeast; 48.7%, in the Southeast; 16.5%, in the South; and 7.7%, in the Center-west.

The Brazilian population reached prevalence rates lower than 1% in the seven measurements at the ideal level. Separately, 3.2% presented ideal diets, followed by physical activity (23.6%) and BMI (43.7%). These factors presented lower rates in all of the analyzed stratifications. The prevalence of ideal values for smoking, BMI, blood pressure, and total cholesterol presented differences between the genders. Women showed more prevalence of ideal levels for: smoking (89.5%) and BMI $< 25 \text{ kg/m}^2$ (46.8%). On the other hand, men presented higher prevalence of ideal levels for arterial hypertension, because 77.7% reported not having been diagnosed with the disease and 87.3% referred not having high total cholesterol (Table 1). Regarding age group, it was observed that younger individuals (18 – 35 years) presented higher prevalence rates of ideal factors, except for diet and smoking habits (Table 2).

Individuals living in the North region presented higher prevalence of ideal levels for most of the assessed factors, except for physical activity and BMI; for these factors, the

Table 1. Prevalence of ideal cardiovascular health and cardiovascular health measurements according to gender: Brazilian adult population (≥ 18 years old) – National Health Survey, 2013.

| Measures* | Women % (95%CI) | Men % (95%CI) | Total % (95%CI) |
|------------------------------|---------------------|--------------------|--------------------|
| Ideal health diet | 3.5 (3.1 – 4.0) | 3.0 (2.5 – 3.4) | 3.2 (2.9 – 3.6) |
| Ideal smoking | 89.5 (88.7 – 90.2) | 81.7 (80.5 – 82.8) | 85.7 (85 – 86.3) |
| Ideal physical activity | 22.9 (21.8 – 24.11) | 24.2 (23.0 – 25.4) | 23.6 (22.7 – 24.4) |
| Ideal BMI | 46.8 (45.5 – 48.1) | 40.5 (39 – 42) | 43.7 (42.7 – 44.7) |
| Ideal blood pressure | 75.2 (74 – 76.2) | 77.7 (76.5 – 78.9) | 76.4 (75.6 – 77.2) |
| Ideal diabetes | 92.7 (91.5 – 93.3) | 93.0 (92.2 – 93.7) | 92.8 (92.3 – 93.3) |
| Ideal total cholesterol | 83.0 (82.1 – 83.9) | 87.3 (86.3 – 88.3) | 85.1 (84.4 – 85.8) |
| Ideal cardiovascular health* | 0.4 (0.2–0.6) | 0.3 (0.2–0.4) | 0.34 (0.2–0.5) |

Ideal cardiovascular health factors: not smoking or having stopped smoking for more than 12 months; body mass index (BMI) < 25 kg/m²; physically active (>150 minutes per week of moderate physical activity or >75 minutes of vigorous intensity); intake of fruits and vegetables at least 5 times per day, at least 5 times per week; consumption of fish at least twice per week; consumption of soft drinks and sugar-sweetened drinks lower than 5 glasses per week; adequate salt consumption; and not reporting diagnosis of dyslipidemia, diabetes, and arterial hypertension.

*Presence of seven measurements at ideal level.

95%CI: 95% confidence interval.

Table 2. Prevalence of ideal cardiovascular health and cardiovascular health measurements, according to age group: Brazilian adult population (≥ 18 years old) – National Health Survey, 2013.

| Measures* | 18 – 35 years % (95%CI) | 36 – 59 years % (95%CI) | ≥ 60 years % (95%CI) | Total % (95%CI) |
|------------------------------|----------------------------|----------------------------|------------------------------|--------------------|
| Ideal healthy diet | 2.5 (2.1 – 2.9) | 3.5 (3.0 – 4.0) | 4.1 (3.2 – 5.3) | 3.3 (2.9 – 3.6) |
| Ideal smoking | 88.0 (86.9 – 89.1) | 83.1 (82 – 84.1) | 87.7 (86.2 – 89.1) | 85.7 (85 – 86.3) |
| Ideal physical activity | 29.7 (28.1 – 31.2) | 21.2 (20 – 22.44) | 17.4 (15.85 – 19.0) | 23.6 (22.7 – 24.4) |
| Ideal BMI | 54.2 (52.4 – 55.8) | 36.8 (35.4 – 38.2) | 40.9 (38.6 – 43.2) | 43.7 (42.7 – 44.7) |
| Ideal blood pressure | 94.7 (94.0 – 95.4) | 73.4 (72.1 – 74.6) | 47.4 (45.2 – 49.7) | 76.4 (75.6 – 77.2) |
| Ideal diabetes | 99.1 (98.7 – 99.3) | 92.7 (91.9 – 93.5) | 80.6 (78.7 – 82.33) | 92.8 (92.3 – 93.3) |
| Total cholesterol | 94.7 (93.8 – 95.4) | 82.0 (80.9 – 83.1) | 74.0 (72.0 – 75.9) | 85.1 (84.4 – 85.8) |
| Ideal cardiovascular health* | 0.5 (0.4 – 0.7) | 0.2 (0.1 – 0.5) | 0.1 (0.0 – 0.4) | 0.3 (0.2 – 0.5) |

Ideal cardiovascular health factors: not smoking or having stopped smoking for more than 12 months; body mass index (BMI) < 25 kg/m²; physically active (>150 minutes per week of moderate physical activity or >75 minutes of vigorous intensity); intake of fruits and vegetables at least 5 times per day, at least 5 times per week; consumption of fish at least twice per week; consumption of soft drinks and sugar-sweetened drinks lower than 5 glasses per week; adequate salt consumption; and not reporting diagnosis of dyslipidemia, diabetes, and arterial hypertension.

*Presence of seven measurements at ideal level.

95%CI: 95% confidence interval.

highest values were obtained in the center-south and northeast regions, respectively. The lowest prevalence rates of ideal levels were found in the South region, except for smoking and diabetes; for these factors, the minimum values were obtained in the Southeast region (Table 3).

After the isolated evaluation, the set of the seven measures composing the total CVH index was analyzed, with emphasis on the differences found between age groups, because the younger individuals (18 – 35 years) showed higher prevalence rates of ideal levels in relation to individuals in the other age groups. Still, concerning the total score of ideal levels, the elderly people (60 years or older) were below the population average, with lower prevalence rates of ideal levels for CVH (Figure 1).

Table 3. Prevalence of ideal cardiovascular health and cardiovascular health measures, according to the region of the country: Brazilian adult population (≥ 18 years of age) – National Health Survey, 2013.

| Measures* | North % (95%CI) | Northeast % (95%CI) | Southeast % (95%CI) | South % (95%CI) | Center-west % (95%CI) | Total % (95%CI) |
|------------------------------|-----------------------|------------------------|------------------------|-----------------------|--------------------------|-----------------------|
| Ideal healthy diet | 5.2 (4.3 – 6.2) | 4.3 (3.7 – 5.0) | 3.0 (2.5 – 3.6) | 2.2 (1.7 – 2.8) | 2.8 (2.2 – 3.4) | 3.3 (2.9 – 3.5) |
| Ideal smoking | 88.6 (87.3 – 9.9) | 86.7 (85.6 – 87.8) | 84.8 (83.6 – 85.9) | 85.3 (83.7 – 86.7) | 86.9 (85.5 – 88.1) | 85.7 (85.0 – 86.3) |
| Ideal physical activity | 24.5 (22.4 – 6.6) | 25.1 (23.5 – 26.7) | 23.3 (22.0 – 24.7) | 20.7 (19.0 – 22.6) | 26.1 (24.4 – 27.9) | 23.6 (22.7 – 24.4) |
| Ideal BMI | 44.8 (42.7 – 46.9) | 47.5 (45.4 – 49.6) | 43.0 (41.4 – 44.6) | 40.4 (38.2 – 42.6) | 44.4 (42.6 – 46.3) | 43.7 (42.7 – 44.7) |
| Ideal blood pressure | 82.4 (80.5 – 84.1) | 79.5 (78.0 – 80.9) | 75.1 (73.7 – 76.4) | 74.5 (72.4 – 76.4) | 76.3 (74.4 – 78.1) | 76.4 (75.6 – 77.2) |
| Ideal diabetes | 94.9 (93.2 – 95.9) | 94.8 (94.0 – 95.5) | 91.8 (90.9 – 92.6) | 92.8 (91.7 – 93.7) | 92.6 (91.5 – 93.6) | 92.8 (92.3 – 93.3) |
| Ideal total cholesterol | 87.0 (85.4 – 88.4) | 85.4 (84.1 – 86.5) | 84.8 (83.6 – 85.9) | 84.4 (82.7 – 86.0) | 86.7 (85.2 – 88.0) | 85.1 (84.4 – 85.8) |
| Ideal cardiovascular health* | 0.5 (0.2 – 1.1) | 0.4 (0.2 – 0.7) | 0.3 (0.2 – 0.6) | 0.0 (0.0 – 0.2) | 0.4 (0.2 – 0.6) | 0.3 (0.2 – 0.5) |

Ideal cardiovascular health factors: not smoking or having stopped smoking for more than 12 months; body mass index (BMI) < 25 kg/m²; physically active (>150 minutes per week of moderate physical activity or >75 minutes of vigorous intensity); intake of fruits and vegetables at least 5 times per day, at least 5 times per week; consumption of fish at least twice per week; consumption of soft drinks and sugar-sweetened drinks lower than 5 glasses per week; adequate salt consumption; and not reporting diagnosis of dyslipidemia, diabetes, and arterial hypertension.

*Presence of seven measurements at ideal level.

95%CI: 95% confidence interval.

By analyzing the indexes of behavioral and biological measures, it was observed that, for gender, age group, and geographic region, the highest prevalence rates were those of biological factors, that is, individuals showed worse performance regarding the behavioral aspects (Figure 2).

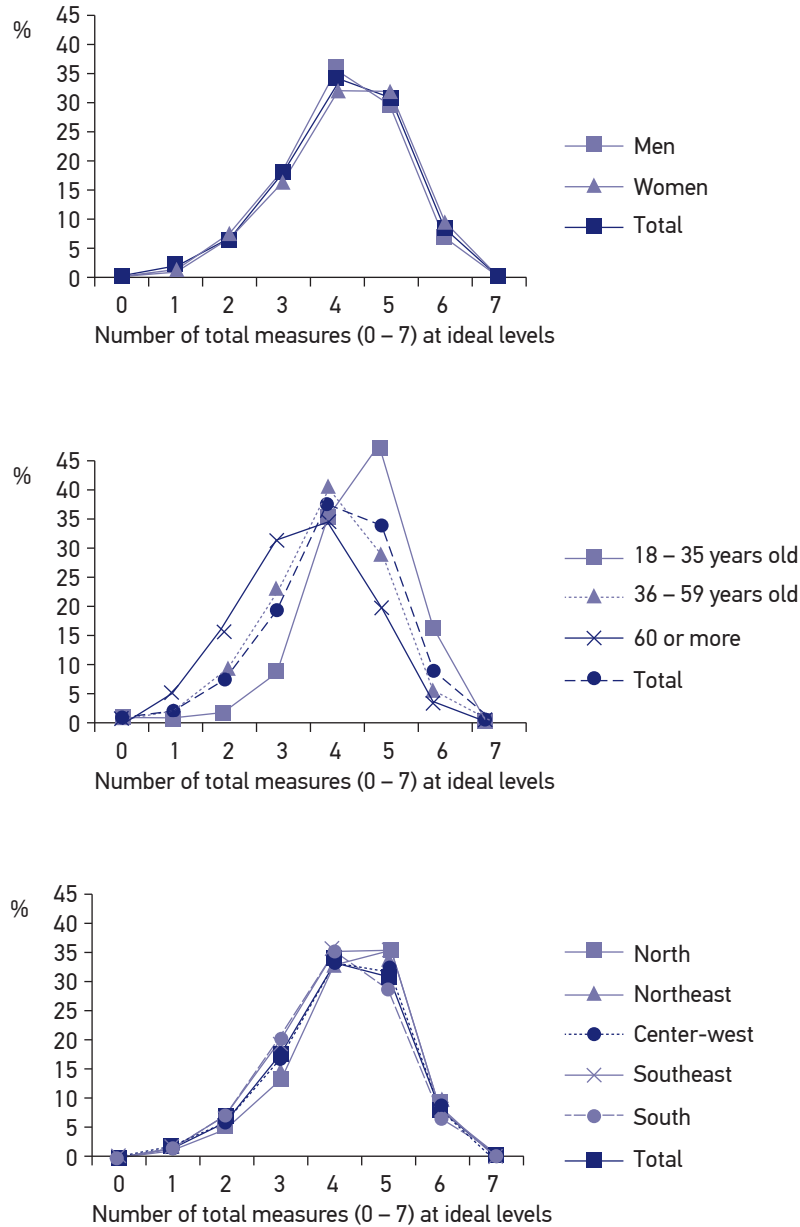


Figure 1. Number of total measures (0 – 7) at ideal levels, according to gender (A), age group (B), and region of the country (C) – National Health Survey, 2013.

DISCUSSION

This is the first study that assesses the frequency of ideal CVH and its components, in a sample representing the adult Brazilian population. The prevalence rates of seven self-reported measures of CVH were estimated, being four behavioral and three biological ones, and CVH indexes using the criteria recommended by AHA. Less than 1% of the population presented an ideal scenario in all of the analyzed factors, therefore, it can be considered as low prevalence of ideal CVH. The ideal level ranged according to the factor analyzed, being higher for the absence of diabetes (92.8%) and lower for adequate diet (3.3%). Women present the best results for smoking and BMI and men for cholesterol and blood

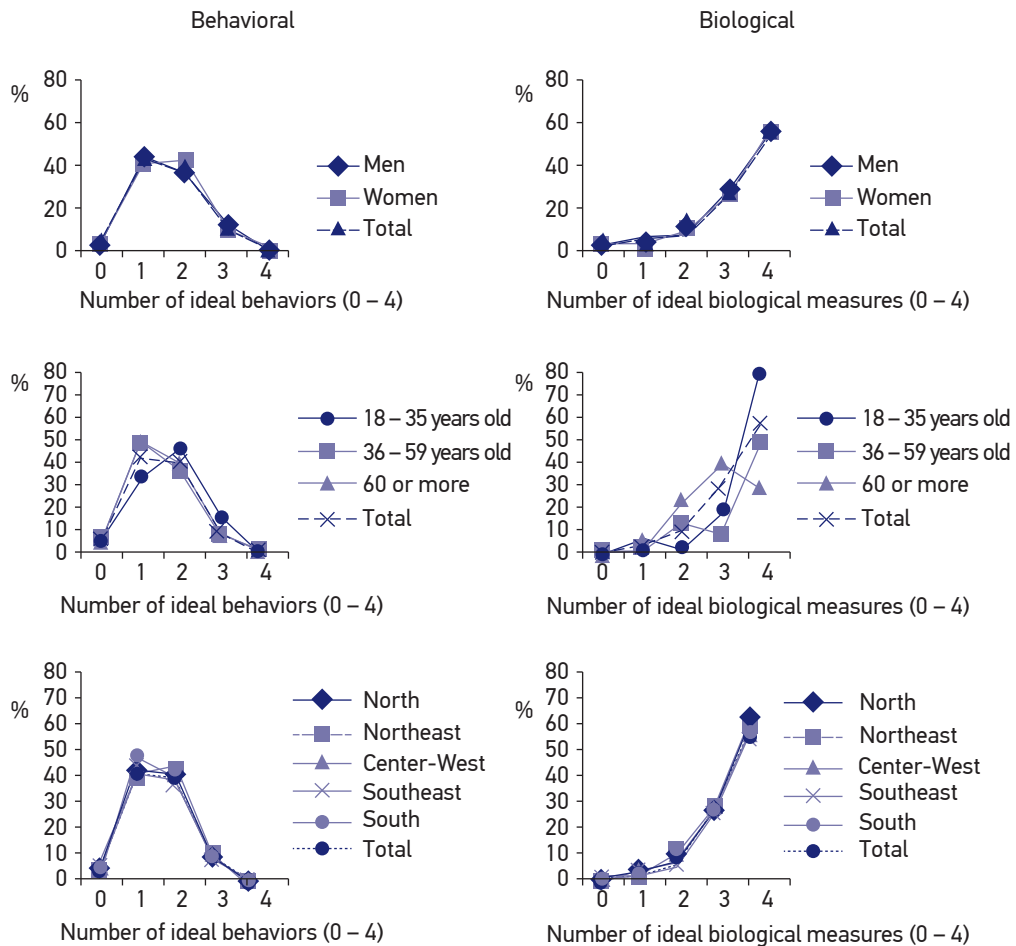


Figure 2. Index of behavioral measures and index of biological measures, according to gender (A), age group (B), and region of the country (C) – National Health Survey, 2013.

pressure. Generally, the group aged between 18 and 35 years and those living in the North region presented the highest prevalence rates with ideal levels.

Caution is recommended to compare the results of this study with those available in the literature about the subject, conducted with populations from other countries, once the number and the measurements are different. It is also possible to admit there are differences of age between regions, which make the comparison of interest only descriptive.

In this study, all of the data used were self-reported, whereas in some of the studies conducted in high-income countries (similar to the United States of America) only information directly measured in the population of interest was used¹³. Once self-reported measures tend to be less precise than those measured directly, the prevalence rates presented here tend to be less accurate than those in studies in which factors were directly investigated^{14,15}. It is a known fact that, based on survey data similar to PNS, the adult population of the country tends to overestimate positive behaviors (such as the recommended consumption of fruits and vegetables) and to underestimate those with negative connotation (such as smoking) and biological markers (such as high total cholesterol, blood glucose and blood pressure), which compose the underdiagnosed conditions^{16,17}, leading us to the conclusion that the ideal CVH of the Brazilian population is even worse than that described in our results. Besides, while some studies contemplate the number of factors at ideal levels^{4,18}, others use scores and score categories (inadequate or poor, intermediate, and ideal)¹³. In this study, the choice was to contemplate both the approaches, allowing the maximum comparability between the estimated results. About these limitations, in other studies considered for comparison, similar results were observed, with low prevalence of ideal CVH^{19,20}. For example, a study using cross-sectional data in high-income countries shows that only 0.02 and 8.2% of the adults presented 7, 6, or 5 factors at ideal levels, respectively²¹.

In a study conducted with a rural population in Brazil, it was observed that only 0.4% of the individuals presented the seven factors at ideal levels, similar to the frequency described for the population in this study¹¹. In this same study, the low prevalence of individuals presenting ideal behavior in the four behaviors stands out: only 1%, regardless of gender.

Estimations indicating CVH in the populations are important instruments to predict the morbimortality for several CVDs and cancers^{4,8,9}. The importance of keeping high frequencies of ideal levels in populations has been demonstrated in recent studies^{7,9}. All evidence indicates lower risk of CVDs in groups with high scores and/or higher numbers at ideal levels. In a cohort with more than 22,000 adults older than 45 years, followed-up for 5 years, it was possible to identify a 25% reduction in the risk of cerebral ischemia adjusted by important confounding variables²². Recently, in a cohort with 12,538 men aged between 40 and 59 years, the group presenting between 6 and 7 ideal measurements showed reductions from 58 to 90% in mortality rates for all causes and caused by cardiovascular conditions, respectively, when compared with the group that presented between 0 and 2 ideal

factors⁶. In 2001, the ARIC cohort, with 15,792 participants of both the genders, showed the reducing risks of incidence of cardiovascular events according to the increasing number of ideal factors, ranging from 89 to 55% when compared with the incidence among individuals who did not have any ideal factor⁹.

Some limitations of this study are the high number of exclusions from the analysis, which can lead to some sort of bias. Besides, there is limitation in the comparison between the regions because of the differences in the age structure. Therefore, better results in the North region, in particular, regarding biological aspects, may have been caused by the younger population in the region.

It is important to mention some methodological advantages of this paper. This study has a probability sample and representativeness of major regions, besides a national scope. Even if the measurement of exposures of interest had been self-reported, it provides an essential image of the CVH of the Brazilian population, as it allows obtaining information in a reliable way, at a more adequate cost. More accurate approximations can be conducted in the future with the liberation of cholesterol and blood glucose values, measured in the laboratory, in a subsample of this research.

CONCLUSION

The isolated and combined estimations of biological and behavioral factors of CVH in the Brazilian population and in the major regions of the country show low prevalence rates at ideal levels. The magnitude of these events in the age group from 18 to 35 years can, at first, be considered as a goal to be reached by all population subgroups. Therefore, the follow-up of CVH measures can potentially be a good surveillance and protective instrument for the CVH of Brazilian populations and the reach of satisfactory primordial prevention levels.

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