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Healthy lifestyle by race/skin color and educational level in Brazil

Estilo de vida saudável por raça/cor da pele e nível educacional no Brasil

Estilo de vida saludable por raza/color de piel y nivel educativo en Brasil

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Abstract
This study aimed to describe the prevalence of healthy lifestyles and examine its association to the combined effects of race and educational level in Brazil. Cross-sectional study. Data were obtained from the 2013 National Health Survey. Race was categorized as white, brown, or black, and educational level as low, medium, or high. To assess the combined effects of race and educational level, a combined variable was created. Healthy lifestyle factors were: non current smoker; non risk use of alcohol; daily consumption of fruit, and vegetables and being active. Lifestyle status was categorized as less healthy or healthier. Of the 59,249 participants, 18.4% of the whites and 6.8% of blacks reported higher education, respectively. Healthy lifestyle status differed by race and educational level. The prevalence of 3 or more parameters were higher than 80% among individuals with high educational levels, regardless of race. The association of healthy lifestyle status with the combined effects of both race and educational levels remained significant after adjustments, except in blacks and browns with high educational levels. Education may be one of an important structural determinant of health status in Brazil, especially among blacks and browns. Investments in education can be helpfull to reduce racial inequalities.
Keywords: Ethnicity and health; Racial health inequalities; Socioeconomic factors; Prevention and control lifestyle.

Resumo
Este estudo objetivou descrever a prevalência de estilos de vida saudáveis e examinar sua associação com o efeito combinados da cor da pele e a escolaridade no Brasil. Estudo transversal. Os dados foram obtidos da Pesquisa Nacional de Saúde 2013, no Brasil. A cor da pele foi categorizada em branco, pardo e negro e a escolaridade em baixa, média ou alta. Para avaliar os efeitos da cor da pele e dos níveis de escolaridade, foi criada uma variável combinada. Os fatores de estilo de vida saudável consistiram em: não fumante; não consumo de risco de álcool; consumo diário de frutas, consumo diário de verduras e legumes e ser ativo. O estilo de vida foi categorizado como menos saudável ou mais saudável. Dos 59.249 participantes, 18,4% dos autodeclararados brancos e 6,8% dos autodeclarados pretos referiram ter ensino superior. O *status* de estilo de vida saudável diferiu por cor de pele e nível educacional. A prevalência de 3 ou mais parâmetros foi superior a 80% entre os indivíduos com alta escolaridade, independentemente da cor da pele. A associação do estilo de vida saudável com os efeitos combinados da cor da pele

e da escolaridade permaneceu significativa após os ajustes, exceto entre aqueles com cor de pele classificada como parda e preta com alto nível educacional. A escolaridade pode ser um dos importantes determinantes estruturais do estado de saúde no Brasil, principalmente entre aqueles que se autodeclaram pretos e pardos. O investimento em educação pode ser útil para reduzir as desigualdades raciais.
Palavras-chave: Origem étnica e saúde; Disparidades nos níveis de saúde; Fatores socioeconômicos; Estilo de vida.

Resumen
Este estudio tiene como objetivo describir la prevalencia de estilos de vida saludables y examinar su asociación con los efectos combinados del color de la piel y el nivel educativo en Brasil. Estudio transversal. Los datos se obtuvieron de la Encuesta Nacional de Salud de 2013 en Brasil. La raza/color de piel se clasificó como blanco, pardos o negro, y el nivel educativo como bajo, medio o alto. Para evaluar los efectos combinados de la raza/color de piel y los niveles educativos, fue creado una variable combinada. Los factores de estilo de vida saludable se componen de: no fumador actual; consumo de alcohol sin riesgo; consumo diario de frutas; consumo diario de verduras y hortalizas y actividad física (actividad física ≥150min / semana). El estilo de vida fue clasificado como menos saludable o más saludable. De los 59.249 participantes, 18,4% de los blancos y 6.8% de los negros reportaron educación superior, respectivamente. El estilo de vida saludable es diferente según la raza y el nivel educativo. La prevalencia de 3 o más parámetros del estilo de vida fue superior al 80% entre individuos con alto nivel educativo, independientemente de la raza. La asociación del estilo de vida saludable con los efectos combinados de la raza/color de piel y los niveles educativos siguió siendo significativa después de los ajustes, excepto en los negros y pardos con altos niveles educativos. La educación puede ser uno de los determinantes estructurales importantes del estado de salud en Brasil, especialmente entre los negros y pardos. La inversión en educación puede ser útil para reducir las desigualdades raciales.
Palabras clave: Origen étnico y salud; Inequidad étnica; Factores socioeconómicos; Estilo de vida.

1. Introduction

Non-communicable chronic diseases (NCDs) are responsible for 71% of all deaths globally (Who, 2018). In Brazil, despite the improvement in public health policies, the scenario is similar (Gbd, 2018). The social inequalities in the country, especially those related to race/color skin and educational level, determine different opportunities for adopting healthy lifestyles and consequently for the prevention of NCDs, delaying the success of these policies (Oecd, 2015; Pearce, 2015; Who, 2018).

In Brazil, those who declare themselves black or brown, represent 55.8% of the population (Ibge, 2018). The country carries through its history of slavery, racial inequality which reflects in worse social and health conditions for blacks (Ibge, 2018). Brown and black people occupy less managerial jobs (29.9 vs. 68.6%), are predominant among those below the poverty (32.9 vs. 15, 4%) and extreme poverty line (8.8 vs. 3.6%), being the majority of those with the lowest income in the country and who live without access to sanitation services (Ibge, 2018).

The association between race and health has been reported in the literature (Cockerham, et al., 2017; Williams & Cooper, 2019; Williams & Mohammed, 2009). In Brazil, in 2018, a comparison of the frequency and sociodemographic distribution of risk and protective factors for chronic diseases showed that the black women population has a higher frequency of overweight and obesity indicators and higher percentages of alcohol abuse. Blacks had lower recommended and regular consumption of fruits and vegetables, in addition to reporting a higher negative evaluation of their health when compared to whites (Brasil, 2019; Szwarcwald et al., 2015; Barros, et al., 2006). Other studies have also reported that blacks present higher prevalence of sedentary lifestyle, smoking, and alcoholic beverage consumption (Barros, et al., 2016), than whites. These results tend to repeat among individuals with lower educational levels (Barros, et al., 2016; Chor, et al., 2015), with the exception being alcohol consumption (Beard, et al., 2019).

The level of education is linked to better wages and living conditions (Bls, 2019; Edgerton, et al., 2012; Connolly & Gottschalk, 2006). In Brazil, brown and black people have the highest illiteracy rates (9.1% vs. 3.9%) and the lowest proportion of young people in higher education (55.6% vs. 78.8%) compared to whites (Ibge, 2018), even with the adoption of measures to expand access to higher education, such as the quotas system for black and indigenous (Brasil, 2012).

It is believed that multiple systems of oppression and of iniquities, such as those related to race/skin color and educational level, produce articulated effects that contribute to the perpetuation of various situations of vulnerability. However, studies investigating these combined actions - are recent and scarce in Brazil (Barber, et al., 2017; Batista & Barros, 2017; Chor, 2019; Malta, et al., 2015). More research is needed in order to better understand the impact of social and racial inequalities on lifestyle, nutritional status, and development of NCDs in the developing countries, as Brazil. It is believed that inequalities in these countries can be greater and more perverse than in developed countries, where a minimum income for human survival is achieved by almost the entire population; and the differences between rich and poor are smaller.

Thus, we used data from the National Health Survey in order to describe and examine the association of combined effect of both race/skin color and educational levels on prevalence of healthy lifestyles in Brazilian population.

2. Materials and Methods

Data source and study population

This cross-sectional quantitative epidemiological study (Szklo & Nieto, 2008). The study examined data from the 2013 National Health Survey (NHS or Pesquisa Nacional de Saúde [PNS]) in Brazil. The PNS was a population-based survey led by Instituto Brasileiro de Geografia e Estatística [IBGE] in a partnership with the Ministry of Health. This survey contains a representative sample of Brazil, its regions, urban and rural populations, and capitals (Souza-Júnior, et al., 2015).

The sampling design was a three-stage cluster sampling, with stratification of the primary units of sampling (UPA).: (1) census tracts or set of sectors were the UPAs and form the primary sampling units, selected by random sampling; (2) the households; and (3) adults >18 years. This selection was made from a list of eligible residents at the time of interview. Details about the sampling plan and balance factors can be obtained in previous publications were published elsewhere (Souza-Júnior, et al., 2015; Szwarcwald, 2014).

Data collection occurred from August 2013 to February 2014, and the questionnaire is presently available on the PNS website (http://www.pns.icict.fiocruz.br).

Healthy Lifestyle

Five parameters, adapte from Patrão, et al., 2017, were considered: (1) Current non smoker; (2) non risk use of alcohol intake; (3) daily consumption of fruit; (4) daily consumption of greens and vegetables and (5) be physically active

For smoking status and alcohol intake, Brazilians were asked about their current habits. A current non smoker was defined as a subject who not current tobacco smokers. A risk use of drinking was estimated based on the amount ingest in doses per week. The questions that investigate alcohol consumption was "*How often do you consume any alcohol?*" following to the questions "*How many days a week do you usually drink alcohol*?" and "*In general, on the day you drink, how many doses of alcohol do you drink?*". From these last two questions, the frequency of consumption was calculated, in doses per week, and the participants were grouped into "non risk use". Who reported "Never having drunk", "less than once a month" or drinking <4 drinks/day for women and <5 drinks/day for men in the last 30 days were also grouped in "non risk use" (Noronha et al., 2019).

Eating habits included consumption of fruit, greens, and vegetables with self-reports about the weekly frequency of consumption (number of days in the week), including the daily consumption as healthy lifestyle factors (Patrão et al., 2017).

Active individuals who achieved at least 150 min per week of mild or moderate leisure time physical activity (LTPA) or 75 min of vigorous LTPA in free time (Mielke, et al., 2015).

Lifestyle status was categorized according the presence of ≤2 parameters as a less healthy; and ≥3 parameter as a healthier lifestyle (Patrão, et al., 2017).

Main explanatory variable

Classification of race/skin color variable was based on IBGE for the 2010 demographic census (Brasil, 2011). IBGE surveys the race/skin color of the Brazilian population based on self-declaration, according to the following options: white, black, brown, indigenous or Asian-descendants. In this study we will analyze the white, black, brown categories, as they are the most prevalent in the country.

To analyze the combined effects of race/skin color and educational level, nine groups of the intersection with race–educational levels were created: White and Low educational; White and Medium educational; White and High educational; Brown and Low educational; Brown and Medium educational; Brown and High educational; Black and Low educational; Black and Medium educational and Black and High educational;

Covariates

Individual sociodemographic characteristics included age (18–24, 25–39, 40–59, and ≥60 years old); sex (male or female) and the access to private health service (yes/no) that could have confounded the association between race/skin color (black, brown, or white) and educational level (Low = no schooling and incomplete primary school or complete primary school and incomplete secondary school; Medium = complete secondary school and incomplete tertiary school; High = Complete tertiary school).

Statistical analysis

We used a significance level of 5%. All analyses were performed using the Stata software, version 14 (Stata Corp., College Station, USA) and accounted for the sampling complex design and unequal selection probabilities.

Frequency distributions were calculated for categorical variables. Comparison of 95% confidence interval (CI) was used to identify any differences between selected sample characteristics by categories of educational level, race/skin color, and the intersection between them.

In order to examine the association between the combined effects of both race/skin color and educational level (using groups of the intersection with race–educational levels) and prevalence of healthy lifestyles, we estimated the odds ratios (OR) and its respective 95% CI using multiple logistic regression and adjusting for sex and age.

Ethics

The National Commission of Ethics in Research (CONEP) approved the PNS project on June 26, 2013 (Regulation number 328.159). All respondents had agreed to take part in the research and signed a free and informed consent form.

3. Results

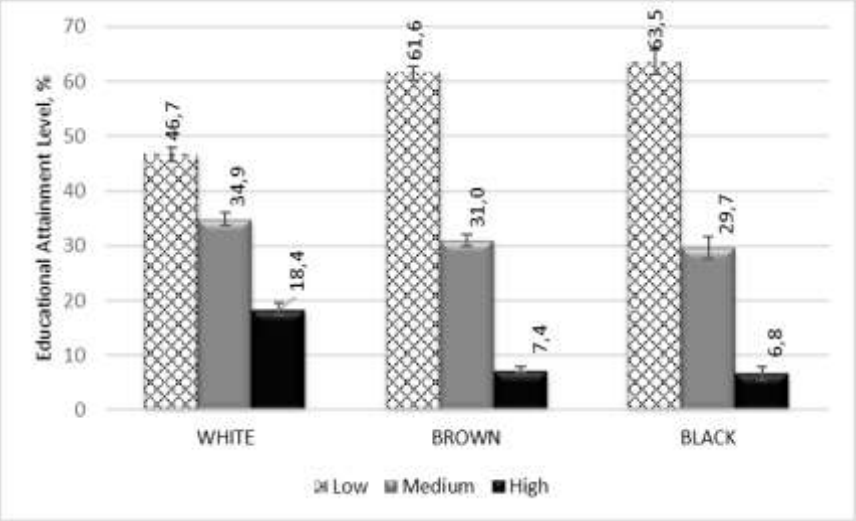
Of the 59,249 participants of this study, 52.8% were men and 37.3% ranged in age from 40 to 59 years old (Table 1). A total of 9.3% of the population were blacks, 42.6% browns, and 48.1% whites (data not presented). In terms of educational levels, 54.6% reported low education, 32.7% medium, and 12.7% high. The lowest prevalence of high educational level was observed in blacks (Figure 1).

Table 1 - Characteristics overall by categories of education and race/skin color - National Health Survey, Brazil. 2013.

Variables (%)	Total	Educational Levels			Race/Skin Colour		
		Low	Medium	High	White	Brown	Black
Age							
18-24	15.9	12.8(12.1-13.5)[a]	24.7(23.5-25.9)[b]	6.9(5.7-8.2)[c]	14.6(13.7-15.4)[a]	17.8(16.9-18.7)[b]	14.6(13.0-16.3)[a]
25-39	31.7	23.8(23.0-24.6)[a]	41.2(40.0-42.5)[b]	41.4(39.1-43.8)[b]	29.6(28.5-30.6)[a]	34.3(33.4-35.3)[b]	31.3(29.1-33.5)[b]
40-59	34.3	37.3(36.5-38.2)[a]	27.5(26.3-28.8)[b]	38.4(36.4-40.6)[c]	35.4(34.1-36.5)[a]	32.6(31.6-33.6)[b]	36.0(33.6-38.5)[b]
≥60	18.0	26.1(25.1-27.0)[a]	6.5(5.9-7.1)[b]	13.2(11.6-15.0)[c]	20.4(19.5-21.3)[a]	15.3(14.6-16.01)[b]	18.1(16.3-20.0)[c]
Female	52.8	51.1(50.1-52.1)[a]	53.7(52.4-55.0)[b]	57.9(56.0-59.9)[c]	53.5(52.4-54.7)	52.0(50.9-53.0)	53.0(50.7-55.2)
Male	47.2	48.9(47.8-49.9)[a]	46.3(45.0-47.6)[a]	42.0(40.1-44.0)[b]	46.4(45.3-47.5)	48.0(47.0-49.0)	47.0(44.7-49.3)
Access to private health service	30.2	16.2(15.3-17.0)[a]	37.9(36.6-39.3)[b]	70.5(68.4-72.4)[c]	39.9(38.4-41.3)[a]	21.01(20.1-22.0)[b]	21.8(19.7-24.1)[b]
Current non smoker	85.3	81.2(80.4-81.9)[a]	89.8(89.0-90.5)[b]	91.3(90.0-92.4)[b]	87.0(86.3-87.7)[a]	83.9(83.1-84.7)[b]	82.3(80.3-84.2)[b]
Non risk use of alcohol intake	93.9	93.8(93.3-94.2)	93.7(93.1-94.3)	94.7(93.7-95.6)	95.0(94.6-95.5)[a]	93.2(92.7-93.7)[b]	91.0(89.7-92.2)[b]
Daily consumption of fruit	51.9	47.4(46.4-48.5)[a]	54.5(53.2-55.8)[b]	64.7(62.6-66.87)[c]	55.2(54.1-56.4)[a]	49.0(47.9-50.2)[b]	48.3(45.9-50.6)[b]
Daily consumption of vegetables	57.6	51.9(50.9-52.9)[a]	60.6(59.3-61.9)[b]	74.2(72.4-76.0)[c]	65.3(64.1-66.4)[a]	49.9(48.9-50.9)[b]	53.1(50.5-55.6)[b]
Physical activity ≥ 150min/week	22.4	15.1(14.3-15.8)[a]	28.8(27.6-30.0)[b]	37.3(35.2-39.3)[c]	23.5(22.5-24.5)[a]	21.7(20.8-22.6)[a]	19.8(18.0-21.7)[b]
≥ 3 healthier lifestyle factors	70.3	63.4(62.4-64.3)[a]	76.2(75.1-77.2)[b]	85.1(83.6-86.4)[c]	75.4(74.4-76.4)[a]	65.6(64.6-66.5)[b]	65.6(63.2-67.8)[b]

Note: Values followed by different letter in the same line are different according to 95% Confidence Interval overlap. Source: Authors.

Figure 1 - Educational Attainment Level prevalence by Race/Skin color in National Health Survey. Brazil, 2013.

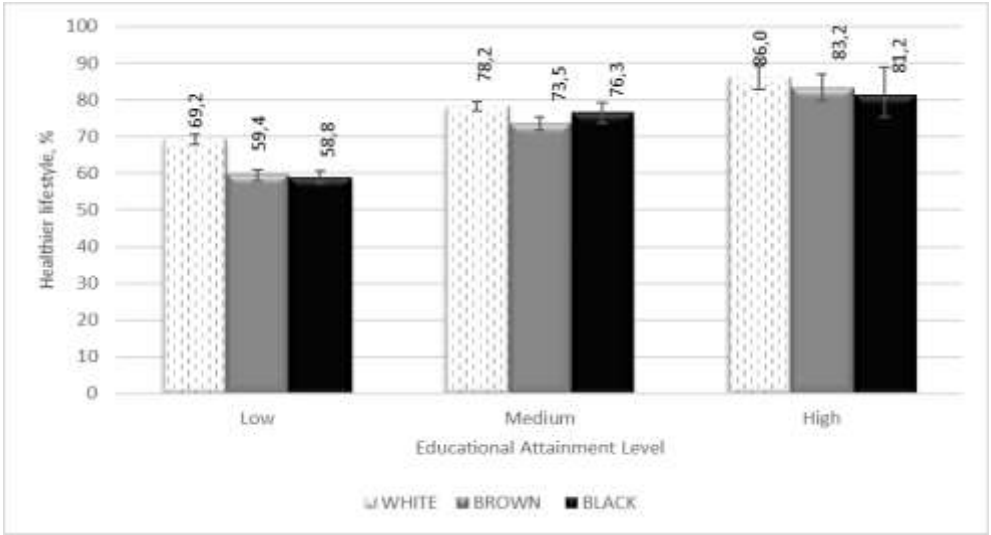


Source: Authors.

The distribution of healthy lifestyle factors was different by educational levels and race/skin colors (Table 1). The prevalence of current non-smoking status and use without risk of alcohol intake was lower among individuals with low educational level, compared to high educational level; and among blacks, in contrast to whites. On the other hand, the daily consumption of fruit and vegetables and physical activity were lower across low educational level individuals and blacks (Table 1).

The results show that 70.3% of the studied population had 3 or more factors related to lifestyle status, which was higher among individuals with high educational levels (85.1%) and whites (75.4%) (Table 1). The proportions of healthy lifestyle status were >80% among all combined categories of race/skin color across high educational level (Figure 2). The prevalence of a healthy lifestyle status (3 or more factors related to lifestyle status) between blacks with high educational level was 81.2% and between Whites, with the same schooling were 86.0%. A similar trend was observed when assessing a lower level of education (58.8% *vs*. 69.2%) (Figure 2).

Figure 2 - Proportions of healthy lifestyle status by race/skin color and educational - National Health Survey. Brazil, 2013.



Source: Authors.

The characteristics of blacks, browns, and whites by education levels were presented on Table 2. Whites with low education when compared to whites with high education have lower prevalence of: current nonsmoker (83.5%; CI95%:82.4-84.6 vs. 91.3%; CI95%:89.7-92.7), daily consumption of fruits (50.9%; CI95%:49.3-52.5 vs. 65.7%; CI95%:63.0-68.2) and vegetables (59.7%; CI95%:58.2-61.1 vs. 77.6%; CI95%:75.4-76.6), and physical activity ≥ 150min/week (14.4%; CI95%: 13.3-15.5 vs. 38.2%; CI95%:35.7-40.7). Similar tendency was observed between the browns and the blacks.

Table 2 - Characteristics of blacks, browns, and whites by education levels- National Health Survey. Brazil, 2013.

Variables (%)	Educational Levels		
	Low	Medium	High
WHITES			
Current non smoker	83.5(82.4-84.6)[a]	89.5(88.3-90.6)[b]	91.3(89.7-92.7)[b]
Non risk use of alcohol intake	95.4(94.7-96.0)	94.8(94.0-95.5)	94.7(93.4-95.7)
Daily consumption of fruit	50.9(49.3-52.5)[a]	55.5(53.6-57.3)[b]	65.7(63.0-68.2)[c]
Daily consumption of vegetables	59.7(58.2-61.1)[a]	66.2(64.3-68.1)[b]	77.6(75.4-76.6)[c]
Physical activity. ≥ 150min/week	14.4(13.3-15.5)[a]	28.0(26.3-29.7)[b]	38.2(35.7-40.7)[c]
BROWNS			
Current non smoker	80.0(78.9-81.1)[a]	89.8(88.6-90.9)[b]	91.7(89.5-93.4)[b]
Non risk use of alcohol intake	93.0(92.3-93.6)[a]	93.0(92.1-93.8)[a]	95.5(94.0-96.6)[b]
Daily consumption of fruit	45.2(43.8-46.7)[a]	53.4(51.5-55.3)[b]	62.2(58.5-65.7)[c]
Daily consumption of vegetables	45.7(44.3-47.1)[a]	54.3(52.5-56.2)[b]	65.9(62.4-69.3)[c]
Physical activity. ≥ 150min/week	15.7(14.6-16.8)[a]	29.7(28.1-31.5)[b]	37.1(33.8-40.6)[c]
BLACKS			
Current non smoker	77.6(74.8-80.2)[a]	90.8(88.3-92.9)[b]	89.0(81.6-93.7)[b]
Non risk use of alcohol intake	90.9(89.2-92.4)	91.0(88.5-93.0)	91.8(84.1-96.0)
Daily consumption of fruit	43.9(40.9-47.0)[a]	53.6(49.5-57.6)[b]	65.8(58.6-72.3)[c]
Daily consumption of vegetables	50.0(46.8-53.1)[a]	56.0(51.7-60.3)[a]	68.9(60.4-76.3)[b]
Physical activity. ≥ 150min/week	14.8(12.9-17.0)[a]	29.1(25.2-33.4)[b]	25.1(18.9-32.5)[b]

Note: Values followed by different letter in the same line are different according to 95% Confidence Interval overlap. Source: Authors.

In the multivariable logistic regression (Table 3), we found a positive association between healthy lifestyle status and educational level adjusted, thus as to race/skin color, after adjusting for sex, age and access to health service. Likewise, we found a positive association between healthy lifestyle and combined effect between educational level and race/skin color. We verified a lower odds of healthy lifestyle status in blacks (OR=0.23), browns (OR=0.24) and whites (OR=0.37) with low educational level in comparison to whites with high educational level. There was no difference in healthy lifestyle status between blacks and browns with high educational level and whites with the same educational level.

Table 3 - Odds ratios of healthy behaviors according to race/skin color, educational level and intersection between race/skin color and educational - National Health Survey. Brazil, 2013.

	Healthier lifestyle			
	No adjusted		**Adjusted by age, sex and access to private health service**	
	OR (95% CI)	**p -value**	**OR (95% CI)**	**p -value**
Race/Skin Color				
Black	**0.62**	**<0.001**	**0.70**	**<0.001**
Brown	**0.62**	**<0.001**	**0.71**	**<0.001**
White	1.00		1.00	
Educational Level				
Low	**0.30**	**<0.001**	**0.40**	**<0.001**
Medium	**0.56**	**<0.001**	**0.73**	**<0.001**
High	1.00		1.00	
Intercetion between black and educational level				
Black x Low educational	**0.23**	**<0.001**	**0.32**	**<0.001**
Black x Medium educational	**0.52**	**<0.001**	**0.71**	**0.005**
Black x High educational	0.70	0.135	0.81	0.335
Intercetion between brown and educational level				
Brown x Low educational	**0.24**	**<0.001**	**0.33**	**<0.001**
Brown x Medium educational	**0.45**	**<0.001**	**0.63**	**<0.001**
Brown x High educational	0.81	0.077	0.92	0.543
Intercetion between brown and educational level				
White x Low educational	**0.37**	**<0.001**	**0.47**	**<0.001**
White x Medium educational	**0.59**	**<0.001**	**0.74**	**0.001**
White x High educational (Ref)	1.00		1.00	

Note: OR= Odds ratios; CI= Confidence Interval. Source: Authors.

4. Discussion

Lower educational levels were associated with a lower chance of healthier lifestyle status, and this scenario was even worse among blacks. However, we found no differences between the prevalence of healthy habits among the highly educated population by on race/skin color.

Our results are consistent with previous studies. Less-educated individuals have less healthy lifestyles: (1) eat less fruits and vegetables (Jaime, et al., 2015); (2) smoke more; and (3) are more likely to be physically inactive (Barros, et al., 2016; Piirtola, et al., 2016). Similar results were found for blacks and browns (Beard, et al., 2019; Malta, et al., 2015; Patrão, et al., 2017), indicating that race and educational level impact health through different relationships and with varying magnitudes Chor, 2013; Fonseca, et al., 2020; Mays, et al., 2007).

Regarding smoking habits, the literature already indicates that higher prevalence has been described in low educational level populations (Malta, et al., 2017; Giovino, et al., 2012; Monteiro, et al., 2007; Mpofu, et al., 2016). A cross-

sectional study used the Health Information National Trends Survey (Assari & Mistry, 2018; Hints, 2020) demonstrated that a higher educational level was associated with lower odds of smoking; moreover, race intersection with a higher educational level suggested a protective effect for whites rather than blacks against current smoking due to the higher amounts of education (Assari & Mistry, 2018). This was confirmed in a Brazilian study, which found a lower prevalence rate of smoking in browns after adjustment for schooling (Malta, et al., 2015).

Differences in the social occupation and geographical spaces by the black and the less educated populations could explain the results, including variations in magnitudes. Blacks tend to occupy more vulnerable areas characterized by poor infrastructure and availability of stores that market healthy foods in addition to a reduced number of quality schools and spaces for leisure and physical activity practice (Barber, et al., 2017; Oecd, 2018; Lopes, et al., 2017; Bower, et al., 2014; Duran, et al., 2013).

Considering these questions, Brazil has produced important of policies to reduced inequality and to promote the inclusion, such as to improvement of basic education and the Bolsa Família Program that requires monitoring and maintenance of children in school. Perhaps, the youngest Brazilians blacks today have more opportunities in comparison to their parents, due to countless actions to reduce hunger and poverty in the country and national health policy of the black population (Brasil, 2010; 2017; 2019), but that does not mean that equal opportunities exist in Brazil. Blacks and browns continue to have higher rates of illiteracy and disparities with respect to healthcare access when compared to whites (Ibge, 2018; Paixão, et al., 2010).

In order to reduce the inequalities, investment in education and the strengthening of equality in the healthcare system and public policies with a racial focus are essential (Brasil, 2017; 2019; Williams & Cooper, 2019). In addition, conditional income transfers programs that facilitate social mobility movements are important for breaking the intergenerational cycles of poverty in addition to favoring maintenance and follow-up of school children (Brasil, 2010; Williams & Cooper, 2019). Affirmative actions in education for the access and maintenance of blacks in all stages and modes of education, especially in the undergraduate stage, are also urgent considering their potential for reducing racial disparities in health status.

For that, actions that truly promote equal rights and opportunities are indispensable. The social participation and dissemination of the debate on the subject within all spaces of dialogue between government and civil society are necessary in order to deconstruct the stereotype of inferiority, inherited from slavery, which limits the opportunities for this population in the different privileged spaces of society, even when they have educational levels similar to whites.

Slavery resulted in a civilizing deconstruction, violent disqualification, inferiorization and dehumanization, whose fight demands political attitude. Recently, it has been observed, in several countries, a strengthening of social movements in favor of the reduction of racial inequities. The publication of studies that support discussions on this subject are urgent to direct the creation of public policies and affirmative actions, both education and health, in order to reduce the worst health and living conditions to which black people are subjected due to the color of their skin. Specifically in Brazil, as a consequence of the intense miscegenation process, brown people are also neglected. Thus, these policies must also include the brown people, who also carry the marks of slavery and structural racism.

Findings of the study must be considered in light of some limitations. First, the results are based on self-perception about race/skin color, which may change over time or be imprecise. However, it is thought that despite classification uncertainties, racial inequalities were perceived. Second, absence of income information may limit the interpretation of results. However, this indicator was not available in the analyzed PNS database, presenting an opportunity for the next studies.

Despite limitations, our study has important strengths. It is the first population-based survey about the combined effects among educational level and skin color, and healthy lifestyle status in Brazil. Additionally, this study allowed for a disaggregated analysis of the results for blacks and browns, which minimized the underestimation of inequality patterns when

blacks and browns are grouped into a single category (Bailey, et al., 2013). It also made it possible to understand how which access to education and on the reduction of health inequities among blacks and browns could potentially facilitate public affirmative actions and policies aimed at promoting racial equality was also obtained. However, at present, the Brazilian government establishment of spending and cuts in education, including the restriction of free university access, scholarships, and threats to public affirmative action. This can be intensify social and racial inequalities and consequently, deepens the racial disparities in Brazilian healthcare.

We believe these findings can support public policies to reduce social inequalities and to attend the addresses the real needs of the most vulnerable populations. The investment is especially important with respect to educational policies for the improvement of basic education; the maintenance of children in schools; programs, such as the *Bolsa Família* (RASELLA et al., 2019); and university access policies, such as quotas. In addition, it's necessary to actions that guarantee the inclusion of black and brown people in all spaces, especially privileged, of society to reduce the immense divide between whites and blacks in Brazil. All of this, in addition to other issues, is necessary to achieve to equal conditions to health promotion and prevention of NCDs, regardless of socioeconomic conditions and race/skin color. It is always important to remember that, in order to promote the health of the population, it is essential to act on the distal social determinants, otherwise, we will continue to dry ice.

5. Conclusion

Our findings provide empirical evidence that the combined effects of race/skin color and higher educational level may be one of the important structural determinant of healthy behavior in Brazil. Investment in education, especially higher education, and ensuring access for disadvantaged populations is one of the main efforts aimed at eliminating racial inequalities in healthcare and health status in Brazil.

Given the importance of this issue and current Brazilian government's distancing from the inequality's reduction agenda, we suggested, analyzes stratified by race/color of research carried out at the national level, such as Surveillance of Risk and Protection Factors; in addition to maintaining this variable in different surveys carried out across the country.

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