

The intersection race/skin color and gender, smoking and excessive alcohol consumption: cross sectional analysis of the *Brazilian National Health Survey, 2013*

A interseção entre raça/cor e gênero, tabagismo e consumo excessivo de álcool: uma análise transversal da *Pesquisa Nacional de Saúde, Brasil, 2013*

La confluencia raza/color de piel y género, ser fumador y consumo excesivo de alcohol: análisis transversal de la *Encuesta Nacional de Salud Brasileña, 2013*

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Abstract

This study aims to investigate whether the intersectional identities defined by race/skin color and gender are associated with smoking and excessive consumption of alcohol in a representative sample of Brazilian adults. This is a cross-sectional study with 48,234 participants in the Brazilian National Health Survey (PNS) – 2013. Crude and adjusted odds ratios (OR) and respective 95% confidence intervals (95%CI) were used to estimate the associations of intersectional categories of race/skin color and gender (white woman, brown woman, black woman, white man, brown man, black man) with smoking and excessive consumption of alcohol, based on the combination of weekly “days” and “servings”. The prevalence of smoking varied from 10.6% for white women to 23.1% for black men, while the prevalence of elevated consumption of alcohol ranged from 3.3% to 14%, respectively. In comparison to white women, only white, brown, and black men presented greater chances of smoking, reaching the OR of 2.04 (95%CI: 1.66-2.51) in black men. As to excessive consumption of alcohol, all intersectional categories showed greater chances of consumption than white women, with the greatest magnitude in black men (OR = 4.78; 95%CI: 3.66-6.23). These associations maintained statistical significance after adjustments made for sociodemographic, behavioral, and health characteristics. Results demonstrated differences in smoking habit and excessive consumption of alcohol when the intersectional categories were compared to traditional analyses. These findings reinforce the significance of including intersectionality of race/skin color and gender in epidemiological studies.

Skin Color; Race; Smoking; Alcohol Drinking; Intersectionality

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Introducción

The theoretical framework of intersectionality presupposes that multiple social categories (such as race, gender, sexual orientation, class) interact at the micro level of individual experiences to reflect interconnected systems of privileges and oppressions at the socio-structural macro level (such as racism, sexism, and homophobia) ^{1,2,3}.

Based on this theory, race/skin color and gender are interdependent and mutually constitutive, and crossing these categories defines multiple intersectional social identities exposing inequalities submerged in traditional approaches of these isolated identities ⁴. Despite the vast amount of existing documentation about the relation between high socioeconomic status and better levels of health care, this does not always occur in the intersectional identities constituted by high social level and racially oppressed groups, for example, defining the so-called intersectionality paradox ³.

Although intersectionality focuses on the multiple categories of social markers that intersect causing disadvantage, it does not predict that all interconnected identities will be similarly harmed, as in the case of the socioeconomic level, which by intersecting with another identity may produce disadvantages or advantages resulting from social mobility ³. Moreover, according to Larsson et al. ⁵, intersectionality enables a better understanding of inequality in health and the factors that determine it, which extend far beyond understanding isolated social hierarchies. This theory considers that the person may, simultaneously, throughout life and in different spaces, experience and accumulate both privileges and disadvantages, according to the combination of different social hierarchies.

When using the perspective of intersectionality, the purpose is to show that traditional approaches – analyzing these categories separately – are incapable of understanding all the complexity of the experiences of intersectional identities and their results in health ^{6,7}. This approach can also delineate potential and additional routes for improving the population's health, and thus guide more effective interventions to reduce social and racial disparities in health ⁴.

Racial inequalities, caused by the oppression systems, are emphasized throughout life, stemming from a spiral of accumulated socioeconomic disadvantages and stresses, producing racial disparities in health, partly due to risky behaviors that act as health markers, as well as health outcome mediators, that is, avoidable morbidity and mortality all over the world ⁸. Smoking and alcohol consumption occupy a prominent position among the 20 main health risk behaviors ⁹.

The consensus regarding how the intersectional identities influence the risk behaviors and outcomes in health does not exist. However, it is known that intersections of minority or disadvantaged identities converge by complex pathways producing negative health results, deepening the inequities in health, and revealing multiple vulnerabilities ^{10,11}. For example, studies that investigated the relation between the intersection of race and gender with risk behaviors, showed that participants with multiple disadvantaged identities are more likely to present abusive consumption of alcohol and other psychoactive substances ¹².

In Brazil, according to the results of a study carried out by Garcia & Freitas ¹³, the prevalence of abusive alcohol consumption was 13.7% in the Brazilian population, greater for men (21.6%) and black individuals (26%). Regarding smoking, the prevalence in the Brazilian population is 15%, also more prevalent in men (19.2%) and black individuals (17.8%) ¹⁴. Nevertheless, we did not identify studies that utilized the intersectional approach to investigate how multiple social dimensions can combine to deepen exposure to risk behaviors in the country. Although intersectionality is a very important tool, it is still generally underutilized.

Thus, this study aimed to investigate if the intersectional identities defined by race/skin color and gender are associated with smoking and excessive alcohol consumption in a representative sample of Brazilian adults. We aimed to test the hypothesis that brown and black women and men, show higher prevalence of smoking and excessive alcohol consumption, as compared to white women, which are not explained by sociodemographic factors.

Methods

Study design

This is a cross-sectional population-based study using data from the *Brazilian National Health Survey* (PNS), a household-based investigation representative of the Brazilian population, conducted by the Brazilian Institute of Geography and Statistics (IBGE) in partnership with the Brazilian Ministry of Health and the Oswaldo Cruz Foundation, in 2013. The PNS was approved by the Brazilian National Research Ethics Commission (process: 328,159, of June 26, 2013), and all interviewees signed an informed consent form.

The PNS sampling process was performed by conglomerate in three stages: in the first stage, based on simple random sampling, the primary sampling units (PSU), census sectors, or sets of census sectors in each stratum of the IBGE master sample were selected, with probability proportional to size; households were randomly selected from the PSU and comprised the second stage; and within each household, a resident aged 18 years or over was randomly selected to answer the individual questionnaire, thus completing the third stage.

Among the 81,254 households selected for visits, 69,994 were occupied; out of these 64,348 adults were selected to answer the individual questionnaire but only 60,202 adults agreed to answer, resulting in a 6.4% refusal rate. This study included only data from the individual questionnaire, from participants of white, brown, and black skin, aged 18-59 years (excluding 11,015 participants), since changes in behavior driven by health problems are more frequent among older individuals. Self-reported indigenous or yellow race/skin color individuals were not included in the analysis due to the small sample number of these participants ($n = 953$), resulting in 48,234 individuals.

Further details on the sampling methods are available in a previous study by Damacena et al.¹⁵

Study variables

- **Outcome variables**

- (a) **Excessive alcohol consumption**

Alcohol consumption was measured based on the combination of information on number of “days” and number of “servings” of alcoholic beverage consumed, and was obtained by the following questions: “How many days a week do you usually drink an alcoholic beverage?” and “In general, on the day you drink, how many servings of alcoholic beverage do you consume?”. Excessive alcohol consumption (no, yes) corresponded to a consumption equal to or greater than 15 servings for men and 8 servings for women, according to the “heavy drinker” indicator, recommended by the Centers for Disease Control and Prevention¹⁶. One serving is equivalent to a can of beer, a glass of wine, or a shot of *cachaça* [sugar cane distillate rum], whisky, or any other distilled alcoholic beverage.

- (b) **Smoking**

Measured by the question “Do you currently smoke any tobacco products?”, the answers were dichotomized into “I do not smoke” and “I do smoke”.

- **Explanatory variable of interest**

- (a) **Intersectional categories of race/skin color and gender**

These categories were prepared based on the combination of the following variables: self-reported race/skin color, obtained by the general characteristics of the residents, utilizing the terms “black”, “brown”, and “white” to classify the skin color or race of the individuals; and gender obtained through the empirical variable sex (male or female), in a binary and biological way. Thus, the variables were combined and the categories ordered as follows: white woman, brown woman, black woman, white man, brown man, and lastly, black man. White woman was considered instead of white man as a reference category, since the prevalence of the two risk behaviors analyzed is known to be lower in the female group.

- **Covariables**

(a) Sociodemographic characteristics

Age, categorized in age groups (18-29, 30-39, 40-49, 50-59 years); level of schooling (complete higher education, complete high school or incomplete higher education, complete elementary school or incomplete high school, incomplete elementary school, no formal education); household per capita income (grouped by quintiles); job status (occupied, unemployed, retired, other – domestic work, informal work, with physical or mental disability, or who did not wish to work) and marital status (married or stable union, separated or divorced, widowed/widower, and single).

Data analysis strategies

Firstly, descriptive analyses of the characteristics of the study population were made, and the prevalence of current excessive alcohol consumption and smoking was estimated, calculated with the respective 95% confidence intervals (95%CI) as per the characteristics of the study population.

Crude odds ratio (OR) – model 0 – was estimated based on univariate logistic regression, to estimate the magnitude of the association between the intersectional categories of race/skin color and gender and the outcomes of interest. Then, multivariate logistic regression analyses were performed to estimate the magnitude of the association between the intersectional categories of race/skin color and gender and the outcomes of interest, with adjustments by potential confounding factors, comprising model 1 (adjustment by age), model 2 (adjustments for sociodemographic characteristics). A 95%CI was adopted for statistical significance, and all the analyses considered the weight and effect of the sample design.

Aiming to clarify the differences of gender within race and vice versa, stratified analyses by gender and race/color of skin were performed. The analysis stratified by gender had as explanatory variable of interest the race/skin color and, the analysis stratified by race/skin color of the skin had as explanatory variable the gender. The gross estimates obtained were adjusted by age (model 1) and other sociodemographic characteristics (model 2) using multiple logistic regression.

All analyses were performed in the Stata software, version 14.0 (<https://www.stata.com/>).

Results

Data from 48,234 individuals were analyzed, with a mean age of 37.4 years, most of them were females (56.3%), brown race/skin color (51.5%), employed individuals (69.3%), reported being single (51.4%), and 40% had completed high school or incomplete higher education. Prevalence of smoking and excessive alcohol consumption was greater among black men (23.1% and 14%), followed by brown men (20.7% and 10.5%, respectively) (Table 1).

The prevalence of smoking was greater among the participants aged between 50 and 59 years (21.4%), with no formal education (29.5%), with the second lower household per capita income (17%), who were unemployed (17.3%) or retired (18.2%), separated/divorced (21.5%), and widowed/widower (19.8%) (Table 1).

Regarding excessive alcohol consumption, the groups presenting the highest prevalence were those aged between 18 and 29 years (8.1%), with complete elementary school and incomplete high school (8.1%), with the higher per capita income (8.7%), unemployed (8.9%), and single (9.1%) (Table 1).

In the univariate logistic regression, compared to white women, the chances of smoking were greater in all intersectional categories, except in brown women. However, after adjusting for sociodemographic characteristics, the chances of smoking remained higher for white, brown, and black men, and the chances were higher for the latter when compared to white women (OR = 2.04; 95%CI: 1.66-2.51) (Table 2).

We observed that excessive alcohol consumption was higher in all intersectional categories regarding white women. Also, black men presented chances 4.78 times higher, compared to the reference category (white women). All associations remained statistically significant and with minimal reductions in the magnitudes after adjustments for sociodemographic characteristics (Table 3).

Table 1

Prevalence of smoking and excessive consumption of alcohol according to the characteristics of the study.
 Brazilian National Health Survey (PNS), 2013 (N = 48,234).

| Characteristic | n | Smoking | | Excessive alcohol consumption | |
|---|--------|---------|-----------|-------------------------------|-----------|
| | | % | 95%CI | % | 95%CI |
| Intersectional categories of race/skin color and gender | | | | | |
| White woman | 10,641 | 10.6 | 9.7-11.6 | 3.3 | 2.8-3.9 |
| Brown woman | 14,081 | 11.9 | 11.0-13.0 | 4.8 | 4.2-5.5 |
| Black woman | 2,456 | 13.1 | 11.1-15.3 | 7.0 | 5.5-9.0 |
| White man | 8,151 | 17.0 | 15.6-18.4 | 8.4 | 7.5-9.5 |
| Brown man | 10,779 | 20.7 | 19.4-22.1 | 10.5 | 9.6-11.5 |
| Black man | 2,126 | 23.1 | 19.8-26.8 | 14.0 | 11.6-16.7 |
| Age (years) | | | | | |
| 18-29 | 14,048 | 11.2 | 10.3-12.2 | 8.1 | 7.4-9.0 |
| 30-39 | 14,041 | 13.4 | 12.4-14.5 | 7.0 | 6.3-7.6 |
| 40-49 | 11,041 | 17.3 | 16.2-18.5 | 6.8 | 6.0-7.7 |
| 50-59 | 8,891 | 21.4 | 19.8-23.0 | 5.3 | 4.6-6.2 |
| Schooling level | | | | | |
| Complete higher education | 7,925 | 9.6 | 8.4-10.9 | 6.1 | 5.2-7.1 |
| Complete high school or incomplete higher education | 19,305 | 10.8 | 10.0-11.6 | 6.9 | 6.3-7.6 |
| Complete elementary school or incomplete high school | 14,057 | 20.1 | 19.0-21.3 | 8.1 | 7.3-8.9 |
| Incomplete elementary school | 3,923 | 20.3 | 18.2-22.7 | 4.6 | 3.7-5.7 |
| No formal education | 3,024 | 29.5 | 26.8-32.4 | 7.8 | 6.4-9.6 |
| Household per capita income (quintiles) | | | | | |
| 5 th (biggest) | 11,658 | 14.4 | 13.2-15.7 | 8.7 | 7.8-9.6 |
| 4 th | 9,395 | 14.3 | 13.2-15.6 | 7.0 | 6.2-7.9 |
| 3 rd | 8,562 | 16.1 | 14.7-17.5 | 7.2 | 6.3-8.4 |
| 2 nd | 9,598 | 17.0 | 15.7-18.3 | 6.4 | 5.7-7.3 |
| 1 st (smallest) | 9,021 | 14.0 | 12.7-15.3 | 5.5 | 4.7-6.4 |
| Job status | | | | | |
| Occupied | 35,887 | 15.1 | 14.5-15.8 | 7.8 | 7.3-8.3 |
| Unemployed | 1,918 | 17.3 | 14.1-20.9 | 8.9 | 6.8-11.6 |
| Retired | 7,771 | 18.2 | 15.3-21.4 | 5.2 | 3.8-7.0 |
| Other * | 13,673 | 14.3 | 13.1-15.6 | 4.4 | 3.7-5.3 |
| Marital status | | | | | |
| Married or stable union | 23,401 | 12.0 | 11.3-12.8 | 4.6 | 4.2-5.2 |
| Separated or divorced | 4,655 | 21.5 | 17.6-22.3 | 7.7 | 6.3-9.4 |
| Widowed/Widower | 4,643 | 19.8 | 11.8-15.1 | 3.5 | 2.2-5.4 |
| Single | 26,550 | 16.9 | 16.2-17.8 | 9.1 | 8.5-9.7 |

95%CI: 95% confidence interval.

* Other: domestic work, informal work, with physical or mental disability, or who did not wish to work.

Table 2

Crude odds ratio (OR) and adjusted of the association between race/skin color and gender intersection and smoking. *Brazilian National Health Survey (PNS), 2013.*

| Intersection of race/skin color and gender | Crude OR | | Model 1 | | Model 2 | |
|--|----------|-----------|---------|-----------|---------|-----------|
| | OR | 95%CI | OR | 95%CI | OR | 95%CI |
| White woman | 1.00 | - | 1.00 | - | 1.00 | - |
| Brown woman | 1.14 | 1.00-1.30 | 1.18 | 1.03-1.35 | 0.97 | 0.85-1.12 |
| Black woman | 1.27 | 1.03-1.55 | 1.28 | 1.04-1.58 | 1.03 | 0.83-1.27 |
| White man | 1.72 | 1.50-1.98 | 1.74 | 1.51-2.00 | 1.74 | 1.50-2.01 |
| Brown man | 2.20 | 1.93-2.51 | 2.35 | 2.06-2.68 | 1.92 | 1.68-2.21 |
| Black man | 2.53 | 2.04-3.14 | 2.54 | 2.05-3.13 | 2.04 | 1.66-2.51 |

95%CI: 95% confidence interval.

Note: model 1: adjusted for age; model 2: model 1 + adjusted for level of schooling, per capita family income, job status, marital status.

Table 3

Crude odds ratio (OR) and adjusted of the association between race/skin color and gender intersection and excessive alcohol consumption. *Brazilian National Health Survey (PNS), 2013.*

| Intersection of race/skin color and gender | Crude OR | | Model 1 | | Model 2 | |
|--|----------|-----------|---------|-----------|---------|-----------|
| | OR | 95%CI | OR | 95%CI | OR | 95%CI |
| White woman | 1.00 | - | 1.00 | - | 1.00 | - |
| Brown woman | 1.50 | 1.20-1.87 | 1.48 | 1.19-1.84 | 1.46 | 1.17-1.83 |
| Black woman | 2.23 | 1.63-3.04 | 2.22 | 1.63-3.03 | 2.09 | 1.52-2.87 |
| White man | 2.72 | 2.20-3.38 | 2.72 | 2.20-3.38 | 2.38 | 1.91-2.97 |
| Brown man | 3.45 | 2.84-4.20 | 3.38 | 2.78-4.11 | 2.90 | 2.37-3.55 |
| Black man | 4.78 | 3.66-6.23 | 4.82 | 3.69-6.28 | 4.08 | 3.07-5.41 |

95%CI: 95% confidence interval.

Note: model 1: adjusted for age; model 2: model 1 + adjusted for level of schooling, per capita family income, job status, marital status.

In gender stratified analysis, race differences in the odds of smoking were slightly higher among men than among women, but only in the age-adjusted analysis. Conversely, the chances of excessive alcohol consumption were 51% (95%CI: 1.20-1.89) and 115% (95%CI: 1.57-2.95) greater for brown and black women, respectively, than white ones, both in the age-adjusted and in the fully adjusted models. Among men, brown and black individuals also showed higher odds of excessive alcohol consumption than white men, but the magnitudes of the associations with race (models 1 and 2) were smaller than those observed among women (Table 4).

In the analysis stratified by race/skin color, gender differences for smoking were somewhat greater among black than among white individuals, in both age-adjusted and fully adjusted models. Regarding excessive alcohol consumption, men had about twice the chances of women across all race/skin color sub-groups, in both age- and fully-adjusted analysis (white male: OR = 2.28; 95%CI: 1.83-2.85; brown male: OR = 1.99; 95%CI: 1.66-2.38; black male: OR = 2.16; 95%CI: 1.50-3.11) (Table 5).

Table 4

Odds ratios (OR) and 95% confidence intervals (95%CI) of the association between race, smoking and excessive alcohol consumption, according to gender. *Brazilian National Health Survey (PNS), 2013.*

| | Woman | | | | Man | | | |
|-------------------------------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|
| | Model 1 | | Model 2 | | Model 1 | | Model 2 | |
| | OR | 95%CI | OR | 95%CI | OR | 95%CI | OR | 95%CI |
| Smoking | | | | | | | | |
| White | 1.00 | - | 1.00 | - | 1.00 | - | 1.00 | - |
| Brown | 1.20 | 1.05-1.38 | 0.99 | 0.85-1.14 | 1.32 | 1.16-1.51 | 1.10 | 0.95-1.27 |
| Black | 1.30 | 1.05-1.60 | 1.04 | 0.83-1.30 | 1.46 | 1.18-1.81 | 1.19 | 0.97-1.47 |
| Excessive alcohol consumption | | | | | | | | |
| White | 1.00 | - | 1.00 | - | 1.00 | - | 1.00 | - |
| Brown | 1.45 | 1.16-1.81 | 1.50 | 1.20-1.89 | 1.26 | 1.07-1.48 | 1.20 | 1.02-1.42 |
| Black | 2.21 | 1.62-3.13 | 2.15 | 1.57-2.95 | 1.76 | 1.37-2.26 | 1.66 | 1.28-2.15 |

95%CI: 95% confidence intervals.

Note: model 1: adjusted for age; model 2: model 1 + adjusted for level of schooling, per capita family income, job status, marital status.

Table 5

Odds ratios (OR) and 95% confidence intervals (95%CI) of the association between gender, smoking and excessive alcohol consumption, according to race. *Brazilian National Health Survey (PNS), 2013.*

| | White | | | | Brown | | | | Black | | | |
|-------------------------------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|
| | Model 1 | | Model 2 | | Model 1 | | Model 2 | | Model 1 | | Model 2 | |
| | OR | 95%CI | OR | 95%CI | OR | 95%CI | OR | 95%CI | OR | 95%CI | OR | 95%CI |
| Smoking | | | | | | | | | | | | |
| Woman | 1.00 | - | 1.00 | - | 1.00 | - | 1.00 | - | 1.00 | - | 1.00 | - |
| Man | 1.73 | 1.51-2.00 | 1.70 | 1.47-1.98 | 1.95 | 1.71-2.21 | 1.98 | 1.72-2.78 | 1.98 | 1.53-2.56 | 2.08 | 1.59-2.72 |
| Excessive alcohol consumption | | | | | | | | | | | | |
| Woman | 1.00 | - | 1.00 | - | 1.00 | - | 1.00 | - | 1.00 | - | 1.00 | - |
| Man | 2.72 | 2.19-3.38 | 2.28 | 1.83-2.85 | 2.31 | 1.84-2.91 | 1.99 | 1.66-2.38 | 2.18 | 1.54-3.08 | 2.16 | 1.50-3.11 |

95%CI: 95% confidence interval.

Note: model 1: adjusted for age; model 2: model 1 + adjusted for level of schooling, per capita family income, job status, marital status.

Discussion

This study, based on a large representative sample of Brazilian adults, examined the association of the intersection of race/skin color and gender with two significant risk behaviors for health: smoking and the excessive consumption of alcohol. Our results indicate that white, brown, and black men, especially the latter, but not brown and black women, presented greater chances of smoking compared to white women. We also found that excessive alcohol consumption was greater in brown and black women, as well as in white, brown, and black men, even after considering sociodemographic differences among the intersectional groups compared. Brown and black men showed the greatest magnitudes of associations, with chances of excessive consumption of alcohol three to four times higher,

respectively, than the consumption by white women. These results confirm our hypothesis of a worse risk behavior profile in the intersection of male identity with the brown and black race/skin color.

In this study, we show that despite both our outcomes smoking and excessive alcohol consumption being risk behaviors in health, crossing the social identities led to distinct relations with these behaviors. For example, women of all intersectional categories are less likely to engage in risky behaviors, such as smoking and excessive alcohol consumption in comparison with men. Therefore, being a woman has been shown to be a protective factor. We emphasize the consideration by Jackson et al.¹⁷ that even in the absence of an association with an intersectional component, such as smoking for brown and black women, these intersectional groups remain more vulnerable due to other factors not considered in this analysis, such as the perception of a lower position in the social hierarchy or racial discrimination, regardless of objective socioeconomic conditions. In other words, the absence of intersectional disparity in a health indicator only suggests that the sum of disparities is not greater than the sum of the two reference identities¹¹.

Most traditional studies show that men and black people generally drink more alcohol. However, the results of the gender stratified analysis indicate that race/skin color inequities in excessive alcohol consumption, but not in smoking, seems greater among women than among men. Furthermore, in the stratified analysis by race, we found that smoking discrepancy seems greater among black men and women, as compared to white men and women, while gender dissimilarities in excessive alcohol intake are about the same across all race/skin color groups.

As Williams¹⁸ reported, despite women being the minority in gender, they showed better health indicators when compared to men. Therefore, based on this assumption, for black men, the health indicators are even worse. According to the author, the causes of differences in gender and health are related to many social factors that affect the reduction in access to resources and status within the society, creating and enhancing inequity in health.

Several studies^{19,20,21} demonstrate great variability in social patterns of alcohol consumption between men and women, which are generally attributed to biological, psychosocial and family history factors²². Overall, men present higher rates of abusive alcohol consumption than women, driven by social constructs such as masculinity²³, and the social roles that “regulate” men and women behaviors, with women often playing “guardians or moderators of alcohol consumption”²⁴.

Historically, alcohol consumption by women is regarded as a problem that affects not only themselves, but also their children and their homes, sustaining a social stigma that perpetuates the differences in alcohol drinking patterns between men and women^{23,25}. However, gender differences in drinking patterns have attenuated in recent years, mostly due to women’s insertion in the workplace and financial independence, added to the stress caused by women’s double/triple journey²⁶. In this context, black women are subject to greater disadvantages and subordinations due to patriarchal racism, difficulties in the educational and work spheres, and heavier loads of violence throughout their lives^{27,28}. Thus, the intersection of gender and race disadvantages increases the probability of black women presenting greater excessive consumption of alcohol and other psychoactive substances²⁹.

Regarding the excessive consumption of alcohol, our results suggest the magnitude of the association with intersectional categories increases as such identity categories become more socially vulnerable, particularly black women and brown and black men. We emphasize that these results were adjusted by variables (schooling level, income, occupation, and marital status), which are potential mediators of the gender/race-skin color relation and excessive alcohol consumption, since identity shapes occupational opportunities and relations throughout life.

Our findings corroborate the study conducted by Demant et al.¹², which showed high-risk and harmful consumption of alcohol, as well as other psychoactive substances, is determined by the crossing of protective and non-protective identities. Williams et al.³⁰, stressed the role of psychosocial stressors in promoting risk behavior by racial minorities. For the authors³⁰, the toxic residential and occupational environments provided by institutional discrimination expose racial minorities to “*conflicts and disruptions such as crime, violence, material deprivation, loss of loved ones, recurrent financial strain, relationship conflicts, unemployment and underemployment*”³⁰ (p. 4).

For Cole⁴, the combination of multiple social identities experienced at the same time affects patterns of risk and resources, with privileges and disadvantages that influence access to health services and care in different contexts. Therefore, when using the intersectional approach, the significance

of the categories of unequal intersection is stressed, as well as the need to investigate how the various dimensions of social status interact to provide or to reduce exposure to risk factors and health care resources.

As previously highlighted, different theories have sought to explain the associations between intersections of social identities and risk behaviors. For example, Glass et al.³¹ showed in their study that the relation between alcohol consumption and poverty is modified by the race/skin color and gender intersection, showing greater persistence of drinking among blacks, both men and women, with income close to the poverty line as compared to whites.

Farmer & Ferraro³² analyzed the relation between race/gender intersection and socioeconomic level, and indicated the socioeconomic level can reduce or increase the frequency of risk behaviors leading to different morbidities, depending on intersectional identities of race and gender.

According to Haeny et al.³³, the adoption of a risk behavior, such as excessive alcohol consumption can also be explained by psychosocial factors, such as racial discrimination and structural racism. Higher alcohol consumption can be partially attributed to strategies to alleviate stress due to racial discrimination³⁴. A study in New Zealand indicates that the experience of discrimination seems to explain, in part, the excessive consumption of alcohol among the Maori population³⁵. A review suggests, that, there is no doubt about the existence of an association between the experience of discrimination (race, gender, socioeconomic, etc.) and the daily consumption of alcohol, although the authors draw attention that studying the specificities involving such associations³⁶ is essential. Mereish & Bradford³⁷ conducted a study on the health disparities in gender, sexual, and racial minorities regarding the use of psychoactive substances, and found that such disparities are more evident and complex when analyzed based on the intersectional categories.

Nevertheless, as we are faced with heterogeneity in the instruments used and in the methodological path followed in the different studies, their comparability is impaired. Bowleg³ suggested that this methodological gap of intersectionality studies in public health is a major challenge, since no consensus on methodological approaches to conduct this type of study is found, scoring as challenges: few studies use intersectionality as a methodological approach; complex formulation of intersectional categories to be analyzed; and traditional statistical methods (linear, correlation, etc.) that do not yet consider the proposal of intersectionality principles.

Studies using intersectionality as a theoretical methodological approach have increasingly occurred in countries such as the United States and Canada^{38,39,40,41,42,43}. However, in Brazil, studies investigating the association of intersectional categories with risk behaviors and health outcomes are still scarce, despite the large and persistent differences in gender and race/skin color registered in the country.

Study limitations

Although our objective includes the intercategory analytical intersectional approach and its association with two significant risk behaviors, we made adjustments by variables that can act as mediators to explain the observed disparities, thus reducing the magnitudes of the final associations considered. Consequently, the results of the crude or non-adjusted analyses can be considered a more accurate picture of the disparities in these risk behaviors related to the intersectional categories of gender and race/skin color.

An important limitation found in the study is the construction of the binary gender category from the man/woman information, which is how the information is collected. Therefore, our results cannot be generalized to a population with other gender identities. Survival bias may have underestimated the magnitude of observed associations, since brown and black men have a higher risk of dying early⁴⁴ and the behaviors studied are associated with a higher risk of chronic diseases, accidents^{45,46}, and violence^{47,48}.

Conclusion

Our results demonstrate the significance of adapting the theory of intersectionality to epidemiological studies, which aim to show the relation between smoking and excessive alcohol consumption and social identity groups built from gender and race/skin color.

Based on the intersection of gender and race, our results show that disparities in smoking and especially in excessive alcohol consumption are more complex than the comparison between genders or just between races. Although we have not found gender differences between races, in the excessive consumption of alcohol, the analysis stratified by gender showed greater racial inequality in the consumption of alcohol among women than in men, i.e., the difference between black and white women in the consumption of alcohol seems greater than between white and black men. Regarding smoking, gender inequalities appear slightly greater in blacks and browns than in white individuals, but we found no indication of racial differences in men or women. Understanding these differences helps improving and better directing social health promotion interventions.

Reducing racial and gender inequities and disparities in health is a public health priority, and crossing multiple social identities allows us to broaden the understanding of race/skin color and gender inequities in health beyond what is shown by the traditional forms of analysis of these categories separately.

Contributors

All authors participated in study design, conducted data acquisition, analysis and interpretation, drafted and reviewed the manuscript and approved the final version of the manuscript.

Additional informations

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Resumo

O estudo teve como objetivo investigar se as interseções de identidades definidas por raça/cor e gênero estão associadas ao tabagismo e ao consumo excessivo de álcool em uma amostra representativa de adultos brasileiros. Este foi um estudo transversal com 48.234 participantes da Pesquisa Nacional de Saúde (PNS) de 2013. Foram usadas odds ratio (OR) brutas e ajustadas com os respectivos intervalos de 95% de confiança (IC95%) para estimar as associações entre interseções de categorias de raça/cor e gênero (mulher branca, mulher parda, mulher preta, homem branco, homem pardo, homem preto) com tabagismo e consumo excessivo de álcool, derivados da combinação de “dias” e “doses” semanais. A prevalência de tabagismo variou de 10,6% em mulheres brancas a 23,1% em homens pretos, enquanto a prevalência de consumo elevado de álcool variou de 3,3% a 14%, respectivamente. Em comparação com mulheres brancas, apenas homens brancos, pardos e pretos apresentaram risco maior de tabagismo, chegando a um OR de 2,04 (IC95%: 1,66-2,51) em homens pretos. Quanto ao consumo excessivo de álcool, todas as categorias mostraram maior risco de consumo em comparação com as mulheres brancas, com a maior magnitude em homens pretos (OR = 4,78; IC95%: 3,66-6,23). As associações mantiveram a significância estatística depois de ajustar para fatores sociodemográficos, comportamentais e de saúde. Os resultados revelam diferenças no hábito de fumar e no consumo excessivo de álcool quando as categorias de interseções foram comparadas a análises tradicionais. Os achados reforçam a importância da inclusão de raça/cor e gênero em estudos epidemiológicos.

Coloração da Pele; Raça; Fumar; Consumo de Bebidas Alcoólicas; Interseccionalidade

Resumen

El objetivo fue investigar si las identidades interseccionales, definidas por raza/color de piel y género, están asociadas con el consumo de tabaco y excesivo consumo de alcohol en una muestra representativa de adultos brasileños. Se trata de un estudio trasversal con 48.234 participantes en la Encuesta Nacional de Salud Brasileña (PNS) – 2013. Las odds ratio (OR) crudas y ajustadas y los respectivos intervalos de 95% confianza (IC95%) fueron usados para estimar las asociaciones de categorías interseccionales de raza/color de piel y género (mujer blanca, mujer mestiza, mujer negra, hombre blanco, hombre mestizo, hombre negro) con el consumo de tabaco y el excesivo consumo de alcohol, derivado de la combinación semanal de “días” y “cantidades consumidas”. La prevalencia de consumo de tabaco varió de 10.6% en mujeres brancas al 23,1% en hombres negros, mientras que la prevalencia de consumo elevado de alcohol fue de un 3,3% al 14%, respectivamente. En comparación con las mujeres brancas, solo blancos, mestizos, y hombres negros presentaron oportunidades mayores de fumar, alcanzando la OR de 2,04 (95%CI: 1,66-2,51) en hombres negros. Así como que, para el excesivo consumo de alcohol, todas las categorías interseccionales mostraron oportunidades mayores de consumo que las mujeres brancas, con una magnitud más grande en hombres negros (OR = 4,78; 95%CI: 3,66-6,23). Estas asociaciones mantuvieron significancia estadística, tras los ajustes realizados para características sociodemográficas, comportamentales, y características de salud. Los resultados demostraron que el hábito de fumar y el excesivo consumo de alcohol mostraron diferencias cuando se compararon las categorías interseccionales con los análisis tradicionales. Estos resultados refuerzan la importancia de incluir la interseccionalidad de raza/color de piel y género en estudios epidemiológicos.

Coloración de la Piel; Raza; Fumar; Consumo de Bebidas Alcohólicas; Interseccionalidad

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