

# Race and perceived racism, education, and hypertension among Brazilian civil servants: the Pró-Saúde Study

## *Raça e racismo percebido, escolaridade e hipertensão em funcionários públicos brasileiros: estudo Pró-Saúde*

Eduardo Faerstein<sup>1</sup>, Dóra Chor<sup>1</sup>, Guilherme Loureiro Werneck<sup>1</sup>, Claudia de Souza Lopes<sup>1</sup>, George Kaplan<sup>1</sup>

**ABSTRACT:** *Introduction:* Brazil has the largest population of African descendants outside Africa. *Objective:* Mindful of the imprint of slavery on their contemporary social position, we investigated the relationship of perceived racism to hypertension. *Methods:* We analyzed data (1999–2001) from 3,056 civil servants (mean age 42 years; 56% females) at university campuses in Rio participating in the longitudinal Pró-Saúde Study. *Results:* Cases of prevalent hypertension had measured blood pressure equal to or greater than 140/90 mmHg or used antihypertensive medication. Self-administered questionnaires assessed participants' perceived history of lifetime discrimination (due to race, gender, socioeconomic position, and other attributes) at work and school, neighborhood, public places, and in contact with the police. Participants used 41 terms as responses to an open-ended question on racial self-identification; for these analyses, 48% were classified as afrodescendants. Racial discrimination in at least one setting was reported by 14% of afrodescendants. Compared to whites, the age- and gender-adjusted prevalence of hypertension was higher for afrodescendants with history of self-perceived racism (prevalence ratio – PR = 2.1; 95%CI 1.5–3.0) than for those with no such history (PR = 1.5; 95%CI 1.2–1.8). Comparing the former to whites, the adjusted association with hypertension was stronger for those with elementary education (PR = 3.0; 95%CI 1.3–6.7) than for those with a college degree (PR = 1.7; 95%CI 1.0–3.1). *Conclusion:* Racism may increase the risk of hypertension of afrodescendants in Brazil, and socioeconomic disadvantage — also influenced by societal racism — may further potentiate this increased risk.

**Keywords:** Social determinants of health. Racism. Hypertension. Adult health. Black population health. Epidemiologic methods.

<sup>1</sup>Universidade do Estado do Rio de Janeiro – Rio de Janeiro (RJ), Brazil.

**Corresponding author:** Eduardo Faerstein. Universidade do Estado do Rio de Janeiro. Instituto de Medicina Social, Departamento de Epidemiologia. Rua São Francisco Xavier, 524, bloco D, 7º andar, sala 7009, Maracanã, CEP: 20559-900, Rio de Janeiro, RJ, Brasil. E-mail: efaerstein@gmail.com

**Conflict of interests:** nothing to declare – **Financing source:** none.

**RESUMO:** *Introdução:* O Brasil tem a maior população afrodescendente fora da África. *Objetivo:* Em razão das sequelas da escravidão sobre sua posição social contemporânea, foi investigada a relação entre racismo percebido e hipertensão. *Métodos:* Analisamos dados (1999 – 2001) de 3056 funcionários públicos (idade média: 42 anos; mulheres: 56%) de campi universitários fluminenses, participantes do Estudo Pró-Saúde. *Resultados:* Casos de hipertensão prevalente tinham pressão arterial aferida igual ou superior a 140/90 mmHg ou uso de medicação antihipertensiva. Via questionários autopreenchíveis, aferiu-se história percebida de discriminação ao longo da vida (devido a raça, gênero, posição socioeconômica, outros atributos) nos domínios trabalho, moradia, escola, locais públicos e com a polícia. Participantes utilizaram 41 termos como respostas a pergunta aberta sobre autoidentificação racial; para estas análises, 48% foram classificados como afrodescendentes. Discriminação racial em ao menos um domínio foi relatado por 14% dos afrodescendentes. Em comparação com participantes brancos, as prevalências (ajustadas para idade e sexo) de hipertensão foram mais elevadas entre afrodescendentes com história percebida de racismo (RP = 2,1; IC95% 1,5 – 3,0) do que entre aqueles sem essa história (RP = 1,5; IC95% 1,2 – 1,8). Comparando-se afrodescendentes com história percebida de racismo com brancos, a associação com hipertensão foi mais forte entre participantes com instrução fundamental (RP = 3,0; IC95% 1,3 – 6,7) do que entre aqueles com nível universitário (RP = 1,7; IC95% 1,0 – 3,1). *Conclusão:* É possível que o racismo aumente o risco de hipertensão entre afrodescendentes no Brasil; a adversidade socioeconômica — também influenciada pelo racismo — pode potencializar esse aumento de risco.

*Palavras-chave:* Determinantes sociais da saúde. Racismo. Hipertensão. Saúde do adulto. Saúde da população negra. Métodos epidemiológicos.

## INTRODUCTION

Hypertension (HT), a major cardiovascular risk factor, may be on the rise worldwide<sup>1,2</sup>, and a similar trend has been observed in Brazil<sup>3</sup>. The excess risk of HT among afrodescendants, compared to whites, has been consistently observed in many populations<sup>4</sup>, including Brazil's<sup>5</sup>. In addition to a number of aspects of dietary intake and excess weight, among other possible causes, exposure to racial discrimination has been increasingly explored as underlying the higher risk of HT among populations of African descent, through a variety of mediating mechanisms, e.g. socioeconomic, behavioral and pschyconeuroendocrine. Overall, the findings suggest that racism may increase HT risk, but evidence is still mixed, and almost entirely restricted to more industrialized societies<sup>6,7</sup>.

Brazil has the largest population of African descendants outside Africa, and their contemporary social position carries the intergenerational imprint of the enslavement of about 3 million individuals brought from West Africa over three centuries<sup>8</sup>, which became a major structural component of Brazilian society. Because little is known about the inter-relationships between racial and socioeconomic inequalities in this country, we report the possible combined effects of African descent/perceived racial discrimination and socioeconomic disadvantage on HT risk in Brazil, a multiracial society in which socioeconomic inequality is pervasive.

## METHODS

Our subjects participated in two stages of baseline data collection (1999 – 2001) of a cohort study (the Pró-Saúde Study) of non-faculty civil servants at university campuses in Rio de Janeiro, Brazil. All eligible employees (4,177) were invited to participate; the response rate was 78% (3,253). More details about the study are reported elsewhere<sup>9</sup>. The present analyses are based on data from 3,056 subjects after the exclusion of 197 individuals with missing data (blood pressure, age, sex, color/race, history of lifetime discrimination, or education) or who self-identified as Asian or Indigenous.

Blood pressure was measured twice with mercury sphygmomanometers, in compliance with standard techniques and international protocols, by trained and certified technicians. Cases of prevalent hypertension had (by averaging the two measurements) systolic blood pressure  $\geq 140$  mmHg, or diastolic blood pressure  $\geq 90$  mmHg, or reported use of anti-hypertensive medication. Quality control indicators (e.g. final digit preference, differences between subsequent measurements, proportion of missing data) monitored *pari passu* with data collection suggest that blood pressure measurements achieved high quality<sup>10</sup>.

We used self-administered questionnaires to assess the other variables. Participants used 41 terms as responses to an open-ended question on racial self-identification; for these analyses, 48% of respondents were classified as afrodescendants.

By means of an abridged adaptation of the Everyday Discrimination Scale<sup>11</sup>, the history of perceived lifetime discrimination was measured by responses to five questions with the same initial phrase: “Have you ever been unfairly treated, discriminated against at your workplace, for example, while getting fired, applying for a job or being denied a promotion?”, “[...] while getting housing or interacting with neighbors?”; “[...] by the police, such as being accused, searched or arrested?”; “[...] in public places, such as banks, shops, hospitals, government offices, etc?”; “[...] in your school or college, for example, being discouraged to continue your studies?” Participants who reported experiences of discrimination were then asked: “The last time this happened to you, which was, in your opinion, the main reason for being discriminated against?” The following response options were offered: skin color or race; being a man or a woman; religion or creed; illness or disability; sexual orientation; socioeconomic condition, education or job; political activism; age; physical appearance; other (specify). In a test-retest reliability study (n = 92, 2 weeks apart), we estimated a kappa coefficient of 0.85 (95%CI 0.72 – 0.98) for responses related to overall discrimination.

For the purpose of the present analyses, we created a composite exposure variable combining dichotomous data on racial self-identification (white, afrodescendant) with dichotomous data on the history of skin color/racial discrimination (ever, never). Because no white participant reported racial discrimination, our exposure variable has 3 categories: whites (reference), afrodescendants with no history of perceived racism (“afro/no racism”), and afrodescendants with history of perceived racism (“afro/racism”). Age and sex-adjusted associations of the exposure categories with prevalent hypertension were estimated through Poisson regression models with robust variance, and subsequently analyzed according to

three education categories (elementary or less, high school, college or more). Statistical analyses were performed using the SPSS for Windows version 11. The study was approved by the State University of Rio de Janeiro research ethics committee.

## RESULTS

Our study population was within the age range of 22 – 69 years (mean = 42 years); 56% of the subjects were females, and 48% were afrodescendants. The age and sex-adjusted prevalence of hypertension was 21%, 26% and 33%, respectively, for white people, “afro/no racism”, and “afro/racism”. Compared to the whites, individuals in the “afro/racism” category had a 2.1 times increased prevalence of HT (95%CI 1.5 – 3.0), and those with no such history showed a prevalence ratio of 1.4 (95%CI 1.2 – 1.8) (Table 1)

Comparing the afrodescendants with history of racial discrimination experiences to the whites, the adjusted association with HT was stronger for those with elementary education (PR = 3.0; 95%CI 1.3 – 6.7) than for those with a college degree (PR = 1.7; 95%CI 1.0 – 3.1), or with complete high school in an intermediate position (Figure 1).

## DISCUSSION

The graded associations observed in our study suggest that among afrodescendants in Brazil, a higher lifetime experience of racial discrimination may substantially increase the risk of hypertension. The data are also consistent with the possibility that socioeconomic adversity — which is influenced by societal racism — may further potentiate this increased risk in a similarly graded pattern. In other words, a combination of these two axes of social disadvantage (race and socioeconomic position) may be operating. To our knowledge, this is the first study conducted with a Brazilian population to report such evidence.

Table 1. Race/perceived racism and prevalent hypertension. Pró-Saúde Study, Rio de Janeiro, Brazil, 1999 – 2001.

	n	%	Hypertension		PR*	95%CI
			%*	95%CI		
White people	1,600	52.4	21.0	19.1 – 23.0	1.0	–
Afrodescendants: no perceived racism	1,258	41.2	26.3	24.1 – 28.5	1.4	1.2 – 1.8
Afrodescendants: perceived racism	198	6.4	33.0	27.4 – 38.5	2.1	1.5 – 3.0

\*Adjusted for age and sex.

Hypertension may be one of several adverse health consequences of race-based discrimination. In this study population, whereas 34% of the participants reported a history of discrimination in at least one life domain, afrodescendants reported histories more frequently than whites across five studied life domains (data not shown)<sup>12</sup>. Hypothesized mechanisms may be indirect, through structuring of socioeconomic disadvantage, which may influence dietary and physical activity patterning; through differential access to health care; or directly, through psychoneuroendocrine mechanisms<sup>6,7</sup>.

The Pró-Saúde study pioneered the adaptation, to a Brazilian population, of one among several existing questionnaires aimed at the measurement of interpersonal discrimination<sup>12</sup>. An additional strength of the study was the use of responses to an open-ended question that allowed participants to classify themselves by race using their own words; because we also included a close-ended question — with response options being the Brazilian Census Bureau (IBGE) list of racial categories — it was possible to observe that a sizeable number of afrodescendants chose “whitening” categories when “forced” to choose from the IBGE list<sup>14</sup>.

There are several potential limitations to consider when interpreting our results. First, we were restricted to prevalent cases of HT. In theory, psychological effects of hypertension “labeling” might include an enhanced perception of racial discrimination. However, we investigated this possibility by stratifying the associations we report according to prior

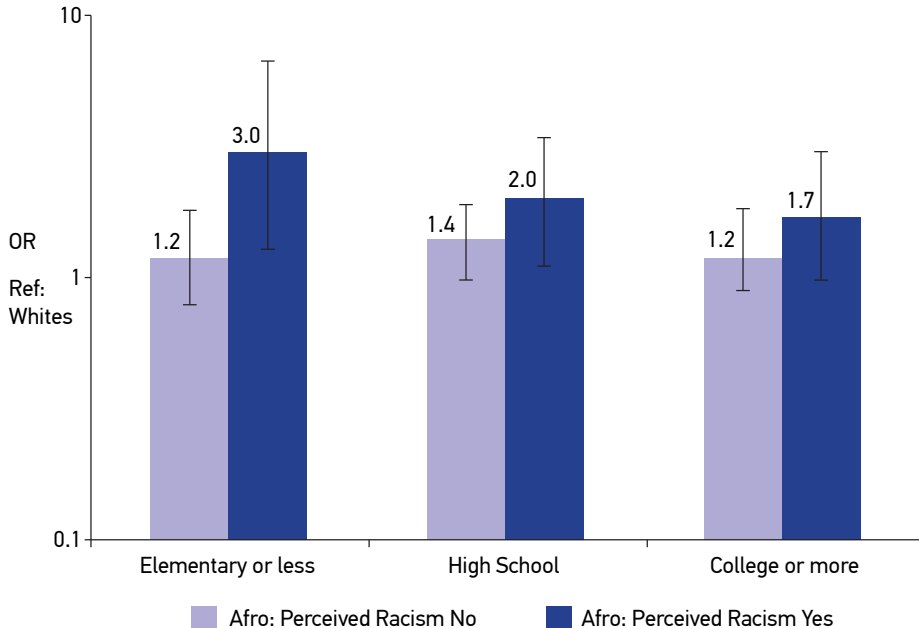


Figure 1. Age and sex-adjusted prevalence ratios (PR) of hypertension by race/perceived racism, according to education. Pró-Saúde Study, Rio de Janeiro, Brazil, 1999 – 2001 (reference category: white people).

awareness of HT, and the results did not differ. Second, even though we studied a population of civil servants with stable jobs and relatively limited socioeconomic variability, we found HT prevalence similar to estimates from statewide and nationwide Brazilian surveys with similar occupational groups. The existing social variability also allowed us to observe distinct associations according to schooling level. Third, we had no available data on which to assess potentially important aspects of our respondents' discriminatory experiences (e.g. intensity, coping behavior), and we were unable to analyze some of the available data (e.g. life domain, timing) due to small numbers.

Given the severity and pervasiveness of race- and ethnicity-based discrimination and violence in the world today, we believe it is critical to explore and document the health effects of these injustices in one of the world's most diverse societies. Further efforts should focus on better measurement, which may result from ongoing refinement of scales dealing with specific aspects of Brazilian race relations<sup>15</sup>. Studies should be replicated across larger and more socially and geographically diverse populations. With specific regard to hypertension, further analyses should explore the association of discriminatory experiences with levels of systolic, diastolic, and pulse pressure, as well as with ambulatory blood pressure and preclinical indicators, e.g. vascular reactivity and endothelial dysfunction. Importantly, the range of health-related outcomes of interest should be expanded, and whenever possible investigated with longitudinal data specifying life domains, types of discrimination, and coping mechanisms. Advances in cognitive research, e.g. Implicit Association Tests (IAT), may prove especially helpful<sup>16</sup>.

More broadly, it will be important to shed light on the web of proximate factors mediating the associations between race discrimination and health, e.g. lifestyle, health care, and the direct effect of chronic stress. A combination of research methods will allow better investigation at levels of society (e.g. institutions) where complex mechanisms of discrimination beyond interpersonal experiences are known to operate<sup>16,17</sup>. In particular, a detailed life course perspective, including concepts such as sensitive and latency periods and age-period-cohort analyses<sup>18</sup>, would benefit further studies of the complex relationships between discriminatory experiences and socioeconomic disadvantage.

## REFERENCES

1. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J. Global burden of hypertension: analysis of worldwide data. *Lancet* 2005; 365(9455): 217-23.
2. Hajjar I, Kotchen JM, Kotchen TA. Hypertension: trends in prevalence, incidence, and control. *Annu Rev Public Health* 2006; 27: 465-90.
3. Schmidt MI, Duncan BB, Azevedo e Silva G, Menezes AM, Monteiro CA, Barreto SM, et al. Chronic non-communicable diseases in Brazil: burden and current challenges. *Lancet* 2011; 377(9781): 1949-61.
4. Cooper R, Rotimi C. Hypertension in blacks. *Am J Hypertens* 1997; 10(7 Pt 1): 804-12.
5. Sichieri R, Oliveira MC, Pereira RA. High prevalence of hypertension among Black and Mulatto women in a Brazilian survey. *Ethn Dis* 2001; 11(3): 412-8.
6. Spruill TM. Chronic psychosocial stress and hypertension. *Curr Hypertens Rep* 2010; 12(1): 10-6.
7. Brondolo E, Love EE, Pencille M, Schoenthaler A, Ogedegbe G. Racism and hypertension: a review of the empirical evidence and implications for clinical practice. *Am J Hypertens* 2011; 24(5): 518-29.

8. Moura C. História do negro brasileiro. São Paulo: Ática, 1994.
  9. Faerstein E, Chor D, Lopes CS, Werneck GL. Estudo Pró-Saúde: características gerais e aspectos metodológicos. *Rev Bras Epidemiol* 2005; 8(4): 454-66.
  10. Faerstein E, Chor D, Griep RH, Alves MGM, Werneck GL, Lopes CS. Aferição da pressão arterial: experiência de treinamento de pessoal e controle de qualidade no Estudo Pró-Saúde. *Cad Saúde Pública* 2006; 22(9): 1997-2002.
  11. Williams DR, Yu Y, Jackson JS, Anderson NB. Racial differences in physical and mental health: socioeconomic status, stress and discrimination. *J Health Psychol* 1997; 2(3): 335-51.
  12. Faerstein E, Bastos JL, Fonseca MJ, Lopes CS. Padrões de discriminação no Estudo Pró-Saúde: Quem? Onde? Por quê? Comunicação oral ao VIII Congresso Brasileiro de Epidemiologia – Abrasco. São Paulo, novembro de 2011.
  13. Bastos JL, Celeste RK, Faerstein E, Barros AJ. Racial discrimination and health: a systematic review of scales with a focus on their psychometric properties. *Soc Sci Med* 2010; 70(7): 1091-9
  14. Maio MC, Monteiro S, Chor D, Faerstein E, Lopes CS. Cor/raça no Estudo Pró-Saúde: resultados comparativos de dois métodos de autoclassificação no Rio de Janeiro, Brasil. *Cad Saúde Pública* 2005; 21(1): 171-80
  15. Bastos JL, Faerstein E, Celeste RK, Barros AJD. Explicit discrimination and health: development and psychometric properties of an assessment instrument. *Rev Saúde Pública* 2012; 46(2): 269-78.
  16. Krieger N. Methods for the scientific study of discrimination and health: an ecosocial approach. *Am J Public Health* 2012; 102(5): 936-45.
  17. Bastos JL, Faerstein E. Conceptual and methodological aspects of relations between discrimination and health in epidemiological studies. *Cad Saúde Pública* 2012; 28(1): 177-83.
  18. Gee GC, Walsemann KM, Brondolo E. A life course perspective on how racism may be related to health inequities *Am J Public Health* 2012; 102(5): 967-74.
- Received on: 05/04/2012  
Final version presented on: 02/05/2013  
Accepted on: 06/12/2013