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Back pain in adults living in quilombola territories of Bahia, Northeastern Brazil

Dor nas costas em adultos residentes em territórios quilombolas, Bahia

ABSTRACT

OBJECTIVE: To analyze the factors associated with back pain in adults who live in quilombola territories.

METHODS: A population-based survey was performed on quilombola communities of Vitória da Conquista, state of Bahia, Northeastern Brazil. The sample (n = 750) was established via a raffle of residences. Semi-structured interviews were conducted to investigate sociodemographics and employment characteristics, lifestyle, and health conditions. The outcome was analyzed as a dichotomous variable (Poisson regression).

RESULTS: The prevalence of back pain was of 39.3%. Age ≥ 30 years and being a smoker were associated with the outcome. The employment status was not related to back pain.

CONCLUSIONS: The survey identified a high prevalence of back pain in adults. It is suggested to support the restructuring of the local public service in order to outline programs and access to healthy practices, assistance, diagnosis, and treatment of spine problems.

DESCRIPTORS: Back Pain, epidemiology. Risk Factors. Rural Population. Health Surveys.

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RESUMO

OBJETIVO: Analisar os fatores associados à dor nas costas em adultos residentes em territórios quilombolas.

MÉTODOS: Inquérito de base populacional foi realizado em 2011 em comunidades quilombolas de Vitória da Conquista, estado da Bahia, Brasil. A amostra (n = 750) foi estabelecida por meio de sorteio de domicílios. Entrevistas semiestruturadas foram realizadas para investigar características sociodemográficas e de emprego, hábitos de vida e estado de saúde. O desfecho foi analisado como variável dicotômica (regressão de Poisson).

RESULTADOS: A prevalência de dor nas costas foi 39,3%. Idade ≥ 30 anos e ser fumante foram associados ao desfecho. A situação de emprego não se associou à dor nas costas.

CONCLUSÕES: O inquérito identificou alta prevalência de dor nas costas em adultos. Sugere-se apoiar a (re)estruturação dos serviços públicos locais, a fim de delinear programas e acesso dos adultos quilombolas às práticas saudáveis, à assistência, ao diagnóstico e ao tratamento dos problemas da coluna vertebral.

DESCRITORES: Dor nas Costas, epidemiologia. Fatores de Risco. População Rural. Inquéritos Epidemiológicos.

INTRODUCTION

Back pain (BP) is a musculoskeletal disorder that affects the main regions of the spine (cervical, thoracic, and lumbar), and it is a public health problem.[11] Approximately 70.0% to 85.0% of the world's population is susceptible to acute or subacute clinical presentations of BP throughout life, with repercussions on the routine of affected individuals, including temporary or permanent work-related disability.[7] In this manner, it becomes the main cause of absenteeism from work and of social welfare and health costs.[11,14]

BP is a multicausal phenomenon. Factors such as sociodemographic, occupational, and lifestyle characteristics are frequently associated with this disorder. The impairment of life quality is well described in literature.[5] However, there is neither a single definition nor standard methods that could facilitate comparisons of results obtained in research.[7]

Pain is felt in a peculiar manner, and its expression is related to subjective experience, involving sensory, cognitive, and sociocultural aspects.[12] It interferes with how people understand, react, and communicate, with or without externalizing the pain process. Ethnic and behavioral characteristics also modulate individual manifestation of the painful sensation in the back.[6]

Although most studies focus only on the lumbar region, this is not the case for the *Pesquisa Nacional de Amostra de Domicílios* (PNAD – National Residence Sample Survey)[a] and other national surveys.[7,b] The Delphi consensus performed in 2006, involving 28 specialists from 12 countries, supports the notion of incorporating more spine regions in the BP definition.[4] In their final document, they consider low BP (lumbar pain) to be a synonym of BP, emphasizing the relevance of including lumbar, cervical, and thoracic pain as adopted by specific surveys. Based on this knowledge, a broader definition of BP was adopted, and it includes the entire structure of the spine.

Regarding living and working conditions at the countryside, the iniquities are apparent when analyzing the social and health indicators. Of note is the predominance of risk factors for musculoskeletal disorders, related to specific agricultural activity.[10] Similarly, in rural quilombola populations, the socioeconomic and racial asymmetries strongly influence the health

[a] Instituto Brasileiro de Geografia e Estatística. Pesquisa nacional por amostra de domicílios, 2008. Um panorama da saúde no Brasil: acesso e utilização dos serviços, condições de saúde e fatores de risco e proteção à saúde. Brasília (DF);2010 [cited 2012 Aug 12]. Available from: http://www.ibge.gov.br/home/estatistica/populacao/panorama_saude_brasil_2003_2008/

[b] Lima-Costa MF, Turci M, Macinko J. Saúde dos adultos em Belo Horizonte. Belo Horizonte: Núcleo de Estudos em Saúde Pública e Envelhecimento da Fundação Oswaldo Cruz; UFMG; 2012.

inequalities.[c] Regarding the quilombola population, there is a lack of epidemiological studies assessing health problems,[3] including BP.

The term "quilombola" refers to remaining ethnic-racial quilombo groups, and their cultural and material heritage confer them a sense of being and belonging to quilombola national territories, according to the criteria of auto-attribution and presumption of black ancestry.[3] In the scope of the health survey conducted in quilombola communities of Vitória da Conquista, BA, Northeastern Brazil, designated as "Projeto COMQUISTA",[3] which guided this present study, this web of sociocultural relations substantiated the hypotheses regarding social inequalities in health.

The present study aimed to analyze the factors associated with back pain in adults who live in quilombola territories.

METHODS

The epidemiological characteristics of quilombola communities was investigated in 2011 using a cross-sectional population-based study with five quilombola communities located in five districts of the Vitória da Conquista Municipality, Bahia. All five communities are certified by the Palmares Foundation for self-recognition of belonging to ancient quilombos.[3]

The estimated universe sample consisted of 2,935 adults residing in selected quilombola areas. The sample plan included the following assumptions: a) randomly selection of one community per district; b) include only communities with at least 50 registered families; c) select via a raffle the residences to be visited; and d) invite all adults (≥ 18 years of age) living in a raffled residence to participate in the survey.

Of the raffled residences (422), 393 were included in the study (93.1%). In total, 797 individuals were interviewed, and 750 adults were chosen after excluding pregnant women (11) and secondary informants (36). The pregnant women were excluded because of transitory muscular changes that occur in the spine region during pregnancy. Regarding the informants, the nature of the auto-referred event (BP) is of individual and subjective character; therefore, it is inappropriate to consider the description of a third party.

For the interviews, we used the semi-structured questionnaire called *Inquérito Região Integrada do Distrito Federal* (Integrated Region of the Federal District Survey) of the *Pesquisa Nacional de Saúde* (PNS – National Health Survey), tailored for the quilombola population. The questionnaire was formatted in two specific modules (individual and residence), and it allowed collecting demographic, socioeconomic, occupational, lifestyle, health status, and morbidity data.

For tbody mass index (BMI), the weight was checked with a portable electronic scale (Marte®, model LC200PP), with a maximum capacity of 200 kg and sensitivity of 50 g. The height was obtained using a portable stadiometer (CauMaq®, model EST-22), with a capacity of 300 mm to 2,000 mm. In the construction of the BMI variable, we considered the national standard values for the definition of normal and altered (overweight/obesity) indexes that interfere with the monitoring of BP.

The question asked to assess BP was: "Do you suffer from a chronic spine problem such as chronic pain in the back or neck, low BP, sciatica pain, or problems in the vertebrae or discs?", with yes or no as l answer options.

The following explanatory variables were considered in data analysis: a) occupational characteristic (employment status); b) individual characteristics (gender, age, marital status, education level, skin color, individual income); c) health status and lifestyle (practice of physical activity, BMI, and smoking).

The variable "employment status" consisted of eight optional answers divided into three categories: unemployed, permanent contract, and temporary contract.

The variable "skin color" was self-declared with the following options: white, black, brown, and other (indigenous, yellow). The definition of skin color followed the national standard, according to the conceptual parameters adopted by PNAD, relating it with the self-declared physical characteristics of the interviewees.

The variable "educational level" included: incomplete elementary schooling; complete elementary schooling; and basic and secondary schooling. The variable "income" referred to the existence of monthly individual income, with yes or no as answer options.

"Physical activity" was evaluated according to the following question: "How many days per week do you do a physical activity or practice a sport?". Two categories were created: "yes", for positive answers, regardless of the number of days per week, and "no" when the individual answered "never". Thus, we can generally assess whether the interviewee performs a physical activity or not. The variable "smoking" was based on a single question about current smoking habits, with yes or no as answer options.

We consulted the local leaders to obtain their consent for this study. Data collection was performed between September and October 2011 and was preceded by mapping and sensitization of communities.

[c] Universidade Federal do Rio de Janeiro. Laboratório de Análises Econômicas, Históricas, Sociais e Estatísticas das Relações Raciais. Relatório anual das desigualdades raciais no Brasil 2009-2010. Rio de Janeiro: Garamond Universitária; 2010.

With the assistance of a GPS and photographic records, we constructed a map to characterize the universe of residences. The data generated by GPS were edited with the identification of each point (waypoint: number and geographic coordinates) in specific spreadsheets, generating the spatial representation of the area and residences. This representation enabled the random raffle of residences in each community using the technique of an electronic random number generator, without repetition, with the assistance of the tool Random Integer Set Generator.[d]

For the suitability of the instrument, besides two pretests (33 interviews), a pilot study was performed within the quilombola community not selected for research (55 families), equivalent to 8.0% of the main sample. The researchers themselves applied a paper version of the questionnaire.

The interviews of the main study were conducted by 24 academics belonging to the health field, who were trained and supervised by the field coordinators (researchers). The questionnaires were adapted to be used on portable computers (HP pocket Rx5710) and to be transported and stored in the Questionnaire Development System program (QDS™; NOVA Research Company, version 2.6.1).

For reliability analysis, we re-interviewed 42 participants (4.5% of sample). We used the observed concordance and kappa statistics for the categorical variables and the Pearson correlation coefficient for continuous variables, obtaining satisfactory indexes and coefficients. Estimates were performed using EpiInfo, version 3.5.3, and R software, version 2.11.1.[3]

For general data analysis, we used the statistical software Stata 11.0. Initially, we performed descriptive analysis, estimating raw and relative frequencies according to the categories of the study variables. Univariable analysis was used to verify the presence of associations of BP with explanatory variable categories. The association between explanatory variables and the outcome (Prevalence ratio – PR) was calculated using the Poisson regression, with estimation of the robust variable.

The explanatory variables that were statistically significant ($p \leq 0.20$) were selected for intermediate multivariable analysis in blocks: sociodemographic and employment; health status and lifestyle.

We opted a hierarchized entry of variables, considering the hypothesis test and the existence of two levels in the following order: on level 1, the sociodemographic and employment variables (gender, age, marital status, education level, skin color, individual income, and employment status); on level 2, the variables related to health status and lifestyle (BMI, smoking, and physical activity).

For the final model, we considered the variables with statistical significance ($p \leq 0.05$) found on levels 1 and 2.

This research project was approved by the Research Ethics Committee of *Faculdade São Francisco de Barreiras* (CAAE 0118.0.066.000-10) and by the Committee of *Universidade Federal de Minas Gerais* (CAAE 0118.0.066.203-10).

RESULTS

The prevalence of BP was of 39.3%, without significant differences between men and women. Among the youngest age group surveyed (between 18 and 30 years), there was a lower prevalence of BP (26.1%). Most residents of the quilombo territories were married (63.7%). The highest prevalence of DC was found among individuals who were legally separated or widows (49.1%), and the lowest prevalence was found among single individuals (30.5%). Regarding education level, 67.3% of the interviewees had incomplete elementary schooling. The prevalence was higher among these interviewees than among those with a higher level of education (Table 1).

Most interviewees had brown skin color (44.6%). A higher prevalence of BP was observed among the group of individuals with white skin color than among those with black skin color.

The habit of smoking was reported by 19.7% of interviewees, and the prevalence of BP was greater among smokers than among nonsmokers (Table 2).

Among the interviewees, 24.1% practiced physical activities at least once a week. The prevalence of BP was lower (35.0%) in this group than in the group that did not practice physical activities (40.5%).

Regarding employment status, 40.0% of the workers had a temporary contract. The prevalence of BP (36.8%) was lower in this group than in the unemployed group and the group that had a permanent contract. However, the differences were not significant in univariable analyses ($p > 0.20$).

In intermediate multivariable analyses, we observed that in the level 1 (sociodemographic and employment), only age was associated with BP. Among variables of level 2 (state of health and lifestyle), BMI, smoking, and physical activity remained in the model.

In the final multivariable analysis, the BP outcome was explained by two factors: age and smoking. Regarding age groups, there was a linear and statistical relationship associated with BP (Table 3).

[d] Haahr M. Random Integer Set Generator. School of Computer Science and Statistics. Dublin: Trinity College; 1998 [cited 2013 Aug 15]. Available from: http://www.random.org/integer-sets/

Table 1. Relative frequency of sociodemographic characteristics, health condition, lifestyle, and occupational variables of the quilombola population. Vitória da Conquista, BA, Northeastern Brazil, 2011. (N = 750)

Variable	%
Gender	
Male	46.5
Female	53.5
Age (years)	
18 to 30	26.5
31 to 50	39.2
> 50	34.3
Marital status	
Single	21.9
Married	63.7
Legally separated/Widow	14.4
Education level	
Basic/Secondary	11.3
Elementary (complete)	21.4
Elementary (incomplete)	67.3
Skin color	
Black	39.5
White	12.6
Brown	44.6
Other	3.4
Income	
Yes	71.7
No	28.3
Employment status	
Temporary contract	40.0
Unemployed	46.7
Permanent contract	13.3
Smoking	
Nonsmoker	80.3
Smoker	19.7
Body mass index	
Normal	57.5
Overweight/Obese	42.5
Physical activity	
Yes	24.1
No	75.9

DISCUSSION

The prevalence of BP was 39.3%, which was lower than that registered in the Pelotas survey, RS, Southern Brazil (63.1%)[7] and higher than that found in a national survey (13.5%).[c] On the regional level, a lower prevalence was recorded in Salvador, BA, Northeastern Brazil (14.7%)[1] and in Belo Horizonte, MG, Southeastern Brazil (7.3%).[b] According to worldwide literature, the lowest prevalence was recorded in Japan and United States at 25.2% and 31.0%, respectively.[15,17]

However, the interpretation of these comparisons requires caution because the inconsistencies on the manifestation and magnitude of PB prevalence may be due to the demographic size investigated and the type of question that led to the variable outcome in each study.[7] Despite the investigators' effort in standardizing a BP definition using the Delphi method, there are still weaknesses in terms of necessary consensus for proper data comparison.[4]

We consistently observed[16] a higher prevalence of BP and positive association in advanced age brackets. Spinal diseases are expected and are distributed according to the age bracket because of mechano-degenerative, metabolic, or systemic changes in the musculoskeletal system.[7]

Among the residents of quilombo territories, there was a higher prevalence of BP among the smokers. The smoking effect is explained by the changes that nicotine causes in the tissue of invertebrate discs.[14]

The practice of physical activity was not associated with BP. This finding is not consistent with those of previous studies. In general, there is a negative association between proper physical activity and BP.[2,14]

Surprisingly, there was no association between BP and the employment status. We expected employed interviewees to be more vulnerable because of a higher chance of exposure to physical activities at work, characterized by anomalous posture and weight lifting.[8] However, unemployment also favors exposure to risk factors for the musculoskeletal system.[14]

The lack of association with employment can be attributed to rural livelihood. It is known that the living and health conditions of the rural groups are not exclusively structured according to job,[10] and this can interfere with BP reports.

Skin color was not associated with BP in any analysis stage, although this characteristic is associated with the reports of worst life and health conditions.[10] A similar result was previously observed by Almeida et al.[1]

The differences in illness experiences can derive from racism and not necessarily from skin color of individuals. Accordingly, an association between perceived discrimination and BP has recently been shown;[6] however, our study did not have the strength to examine this attribute.

Gender and education level were not significantly associated with BP, confirming the results obtained in the Salvador population, city next to quilombola communities.[1] However, these results are not consistent. In Germany[14] and China,[9] there was an association between gender, education level, and BP.

In the group of legally separated persons or widows and unmarried couples, there was a higher prevalence

Table 2. Prevalence and prevalence ratio of back pain in quilombola population, according to sociodemographic characteristics, health condition, lifestyle, and occupational variables. Vitória da Conquista, BA, Northeastern Brazil, 2011. (N = 750)

Variable	BP Prevalence (%)	PR	95%CI
Gender			
Male	39.0	1.0	
Female	39.7	1.02	0.85;1.22
Age (years)			
18 to 30	26.1	1.0	
31 to 50	40.1	1.54	1.17;2.02[a]
> 50	48.6	1.86	1.43;2.43[a]
Marital status			
Single	30.5	1.0	
Married	49.2	1.32	1.02;1.70[a]
Legally separated/Widow	49.1	1.61	1.19;2.17[b]
Education level			
Basic/Secondary	28.3	1.0	
Elementary (complete)	35.6	1.26	0.85;1.88[b]
Elementary (incomplete)	42.5	1.50	1.06;2.14[a]
Skin color			
Black	36.3	1.0	
White	39.8	1.09	0.82;1.47[b]
Brown	41.5	1.14	0.94;1.39
Other	48.0	1.32	0.86;2.04
Income			
Yes	39.0	1.0	
No	40.1	1.05	0.86;1.27
Employment status			
Temporary contract	36.8	1.0	
Unemployed	39.8	1.08	0.88;1.32
Permanent contract	45.0	1.22	0.94;1.59
Smoking			
Nonsmoker	36.5	1.0	
Smoker	50.7	1.39	1.15;1.68[a]
Body mass index			
Normal	36.7	1.0	
Overweight/Obese	43.3	1.18	0.99;1.41[b]
Physical activity			
Yes	35.0	1.0	
No	40.5	1.16	0.93;1.45[b]

BP: back pain
[a] $p \leq 0.05$
[b] $p \leq 0.20$

Table 3. Final multivariate model (Poisson regression) for back pain in quilombola population. Vitória da Conquista, BA, Northeastern Brazil, 2011. (N = 750)

Variable	PR	95%CI
Age (years)		
18 to 30	1.0	
31 to 50	1.47	1.12;1.94[a]
> 50	1.80	1.38;2.35[a]
Smoking		
Nonsmoker	1.0	
Smoker	1.31	1.08;1.59[a]

[a] $p \leq 0.01$

of BP; however, marital status was not included in the final analyses. In general, single individuals are younger, and the latter is a protection factor for BP. A similar result to this study was found in an American survey[13] and a Brazilian survey.[1]

This study shows the general prevalence of BP in a predominantly rural, poor, less educated, underemployed, and socially unprotected population. Due to the cross-sectional approach, it was not possible to establish the cause and effect. However, the results reinforce the relation between individual factors (age), lifestyle habits (smoking), and BP.

The methodology used in the study was appropriate to achieve the objectives. A partial adaptation of the PNS questionnaire to quilombola reality ensured representativeness for comparisons in relation to the studied object. The following can be considered adequate: performance of pilot project, training of interviewees for data collection using portable computers, precedence by sensitization of local leaders, and mapping the territories for correct localization of residences. Reliability analysis showed the coherence of strategies used in this study.

The question that led to the outcome, formulated in present time, avoided the possibility of recall bias and, consequently, the underestimation of BP prevalence. Despite the use of medical terms in the structure of questions, interviewees did not seem to have interpretation problems because the reliability of answers (kappa index) was equal to 1, meaning 100% agreement in repeated interviews. However, the lack of a reference to BP periodicity is a limitation for proper comparisons.

A more detailed approach is required to clarify the absence of connection between the employment status and spinal manifestations of pain. Considering the homogeneity of the quilombola population in terms of general life conditions, it is probable that the work conditions were not sufficiently significant to explain BP. However, in future, it would be appropriate to design studies that can differentiate exposures specifically related to lifestyle, work, and job.

The results of this study indicate the need of developing prevention strategies to control and reduce the prevalence of BP in investigated quilombola communities. Local seminars, which took place in 2014, disclosed the results to members of the Brazilian Unified Health System (SUS) and to members from social movements and from the university. We expect to strengthen the institutional debate to support restructuring of local public services in order to develop programs and access of quilombola adults to healthy practices, assistance, diagnosis, and treatment of spine problems.

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