

# Chronic spinal problem/back pain in quilombola populations of Bahia, Northeast of Brazil

*Problema crônico de coluna/dor nas costas em população quilombolas de região baiana, nordeste brasileiro*

*Problema/dolor crónico de la columna/espalda en la población quilombola de Bahía, en el Nordeste brasileño*

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**ABSTRACT** | The aim of the study was to estimate the prevalence of chronic spinal problems or back pain (CSP/BP) and the sociodemographic factors, the lifestyle, the chronic diseases associated with quilombola adults. We carried out a population, sectional, epidemiological study with a representative sample from a Northeastern state. We collected data by interviewing participants using a standardized form. Statistical analysis comprised robust Poisson regression, prevalence ratios, confidence interval (95%), and significance level lower than 5%. The prevalence of CSP/BP was of 50.5% (95% CI: 47.1: 53.9), independently associated with age, sleep quality, self-reported health, motor disabilities, and work-related musculoskeletal disorders. We observed higher exposure to CSP/BP among quilombolas aged >40 years, with poor sleep quality and poor self-reported health diagnosed with work-related musculoskeletal disorders (WMSD) and motor disabilities.

**Keywords** | African Continental Ancestry Group; Spine; Health Surveys.

**RESUMO** | O objetivo deste estudo foi estimar a prevalência de problemas crônicos de coluna ou dor nas costas (PCC/DC), os fatores sociodemográficos e de estilo de vida e as doenças crônicas associadas em adultos quilombolas. Foi realizado estudo epidemiológico, populacional e seccional, com amostra representativa de uma região

de um estado nordestino. Os dados foram coletados por meio de entrevista com formulário padronizado. A análise estatística consistiu na regressão de Poisson robusta, com cálculo das razões de prevalência, intervalo de confiança (95%) e nível de significância inferior a 5%. A prevalência de PCC/DC foi de 50,5% (intervalo de confiança - IC95%: 47,1;53,9), independentemente associada ao grupo etário, à qualidade do sono, à saúde autorreferida, à deficiência locomotora e aos distúrbios osteomusculares relacionados ao trabalho (Dort). Houve maior probabilidade de exposição aos PCC/DC para os quilombolas com idade >40 anos, má qualidade do sono, pior saúde autorreferida, diagnóstico de Dort e deficiência locomotora.

**Descritores** | Grupo com Ancestrais do Continente Africano; Coluna Vertebral; Inquéritos Epidemiológicos.

**RESUMEN** | El presente estudio buscó verificar la prevalencia de Problemas Crónicos de Columna o Dolor de Espalda (PCC/DE) y los factores sociodemográficos, de estilo de vida y las enfermedades crónicas asociadas en adultos *quilombolas*. Se realizó un estudio epidemiológico, poblacional y seccional, con una muestra representativa de una región del Nordeste brasileño. Los datos se recolectaron por medio de una entrevista con formulario estandarizado. El análisis estadístico consistió en la regresión de Poisson robusta, con cálculo de las razones de prevalencia, el intervalo de confianza

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(95%) y el nivel de significancia inferior al 5%. La prevalencia de PCC/DE fue del 50,5% (intervalo de confianza – IC95%: 47,1:53,9), independientemente asociada al grupo de edad, la calidad del sueño, la salud autorreferida, la deficiencia locomotora y los trastornos osteomusculares relacionados al trabajo (Dort). Se observó que

hubo una mayor probabilidad de exposición a los PCC/DE en los *quilombolas* con edad >40 años, mala calidad del sueño, peor salud autorreferida, diagnóstico de Dort y deficiencia locomotora.  
**Palabras clave** | Grupo de Ascendencia Continental Africana; Columna Vertebral; Encuestas Epidemiológicas.

## INTRODUCTION

The spine is one of the structures of the human body of greater locomotor demand, which can affect posture, and lead to musculoskeletal problems and pain<sup>1</sup>. Chronic spinal problems/back pain (CSP/DC) comprise several morbidities. Neck, chest and sciatica pains, intervertebral disc disorders, spondyloses, back pain and radiculopathy are the most common ones<sup>2</sup>.

These morbidities also represent the most prevalent health problems<sup>3</sup>. A fifth of Brazilian adults show CSP/DC<sup>2</sup>, affecting around 15% and 20% of the lifetime of individuals<sup>3</sup>, being the second most prevalent chronic disease in this population<sup>4,5</sup>. Despite not being severe, such problems affect individuals' health conditions negatively<sup>3</sup>.

The use of health services by sick people increased proportionally to the sociodemographic characteristics of patients<sup>6</sup>. We estimate that around 70% to 85% of the population will experience an episode of BP during their lifetime<sup>7</sup>. However, there are still disagreements on the prevalence of CSP/BP and its predisposing factors<sup>2,7-9</sup>, especially concerning ethnic and racial characteristics.

Considering the continental dimensions and socio-demographic, economic and racial-ethnic differences of Brazil, there is need for further screening actions to be taken in the different regions and populations to properly address different epidemiological frameworks. Thus, ethnic and racial health indicators show it is even worse for black people<sup>10</sup>. As *quilombolas* descend from black slaves who worked with agriculture<sup>11</sup>, socio-economic and ethnic-racial issues reinforce health inequalities<sup>12</sup>.

Given the lack of information on the life and health conditions of black populations, which hinders the understanding of the health-disease process regarding CSP/BP and its predisposing factors, this study aims at estimating the prevalence of CSP/BP, the sociodemographic factors, the lifestyle and the chronic diseases associated with *quilombola* adults.

## METHODOLOGY

This is a cross-sectional and descriptive study with analytical aspects, based on primary data derived from a population-based cross-sectional epidemiological survey named: "Perfil epidemiológico dos quilombolas baianos", authorized by the Human Research Ethics Committee of the Universidade do Estado da Bahia, under protocol no. 1,386,019/2016, Certificate of Ethical Assessment (CAAE) No. 49955715.6.0000.0057.

The empirical field was the geographical microregion of Guanambi, Bahia, with 42 *quilombos* and contemporary rural descendants<sup>13</sup> by the year 2016, divided into ten municipalities. Given the unavailability of previous official information on the number of inhabitants of these *quilombos*, population was estimated considering 80 families per *quilombo*<sup>14</sup>, with two adults (>18 years) per household in each community, totaling 6,720 adults.

The sample calculation comprised finite population correction, unknown prevalence for the outcome (50%), confidence interval of 95%, tolerable sampling error of five percentage points, design effect of 1.5 to cluster sampling, 30% additional to refusals and 20% for losses and misunderstandings, determining a sample of 818 subjects; more information on the sampling and methodological procedures can be found in previous studies<sup>15</sup>.

Those with cognitive or communicative disabilities were excluded from the interviews. Inpatients, amputated people and people in plaster, pregnant women and mothers with kids of less than six months were excluded from the anthropometric measurements. When patients did not complete a measurement, test or did not reply to any of the questions of the interview, we considered it as a loss.

The CSP/BK is the dependent variable determined from the response ("yes" or "no") to the following question: "Do you have a chronic spinal problem, such as chronic back or neck pain, low back and sciatica pain, vertebrae or disk problems?", which went through the validation process for application in the *quilombola* population<sup>12</sup>.

Socio-demographic variables are: sex (female, male), age group (<40 years, ≥40 years), schooling (≤5 years, >5 years) and working hours per week (≤44 hours/week, >44 hours/week).

Lifestyle (as a validated instrument of quilombola adults)<sup>12</sup>: general physical activity (those with >150 min per week were considered active and those with ≤150 min per week were considered insufficiently active), sedentary behavior (hours watching TV a day, >3 a day representing the presence of sedentary behavior) and self-reported quality of sleep (“very good” and “good” grouped into “good quality”; “regular”; and “poor” and “very poor” grouped into “bad quality”).

Self-reported health perception (“very good” and “good” grouped in positive; “regular”; and “poor” and “very poor” in negative), self-reported arthritis/rheumatism (“yes” or “no”), self-reported motor disability (“yes” or “no”), work-related musculoskeletal disorders (WMSDs)- (“yes” or “no”) and obesity (>30% body fat for women and >25% for men)<sup>16</sup>.

Measurements of fat percentage, determined by a bioimpedance validated scale (Omron hbf-514c, with capacity of 150 kg and 0.1% accuracy)<sup>17</sup>, occurred during the morning, before breakfast, in duplicate to ensure accuracy, or even three times in case of difference between the first two measurements, thus analyzing it from the median. Before that, we verified alcohol, caffeine and intense physical activity abstinence in the last 24 hours. The participants were told to remove metal objects and to remain at rest for five minutes before the tests.

To analyze the association of predictors with CSP/BK prevalence ratios (PR) were estimated from Poisson regression with robust variance. After verifying crude prevalence ratios, those with p-value <0.20 were considered for multiple analysis. The variables with p-value <0.05 in the saturated model were defined as associated with the outcome. The magnitudes of association were estimated by the 95% confidence interval (95%CI). All analyses were performed in the program SPSS Statistics, 22.0 version.

## RESULTS

The CSP/BK was prevalent in 50.5% (95%CI: 47.1:53.9) of quilombolas, the absence of response rate was of 3% (26 losses). Age ranged from 18 to 92 years with median of 45. Most of them referred to themselves as black (86.5%) Women predominated 61.2%, 95%CI: 57.9:64.5). Table 1 presents the other characteristics of this population.

Table 1. Characteristics of quilombolas. Bahia, Brazil, 2016 (n=850)

Sex	Female	61.2% (520)
	Male	38.8% (330)
Age group	<40 years	42.1% (358)
	>40 years	57.9% (492)
Race-skin color	Blacks	86.6% (716)
	Others	13.4% (111)
Schooling	>5 years	41.5% (321)
	<5 years	58.5% (453)
Working hours per week	<44 hours/week	73.8% (363)
	>44 hours/week	26.2% (129)
Sleep quality	Good	65.7% (541)
	Regular	22.7% (187)
	Poor	11.5% (95)
General physical activity	>150 min	78.1% (650)
	<150 min	21.9% (182)
Sedentary behavior	>3 hours/day	77.2% (578)
	<3 hours/day	22.8% (171)
Self-reported health	Positive	48.9% (404)
	Regular	41.6% (344)
	Negative	9.6% (79)
Arthritis/Rheumatism	Yes	13.0% (107)
	No	87.0% (718)
Dort	Yes	10.0% (82)
	No	90.0% (740)
Locomotor disability	Yes	21.3% (176)
	No	78.7% (649)
% fat	Obese	63.0% (513)
	Not obese	37.0% (301)

Crude analysis (Table 2) showed higher prevalence of CSP/BP ( $p < 0,05$ ) among those aged ≥40 years, with ≤5 years of schooling, regular or poor quality of sleep, self-reported health as regular or negative, and diagnosed with arthritis and/or dort, and motor disability.

In multiple analysis (Table 2), after adjusting the variables included in the final model ( $p < 0.20$ ), the ones that remained independently associated with CSP/BP were: age group, quality of sleep, self-reported health, Dort diagnosis, and motor disability. Therefore, quilombolas

aged 40 years showed a probability 41% higher to have CSP/BP. Similarly to those who reported having poor sleep quality, poor health conditions, a diagnosis of Dort and motor disabilities had 27%, 55%, 51% and 29% higher chances of achieving the investigated outcome.

Table 2. PR of chronic spinal problem and its 95% confidence intervals (95%CI) according to socio-demographic, lifestyle and health condition variables. Bahia, Brazil, 2016 (n=850)

VARIABLES	PR (95%)	p-value <sup>1</sup>	PR (95%)	p-value <sup>2</sup>
Sex				
Male	1		1	
Female	1.144 (0.991:1.321)	0.067	1.174 (0.997:1.383)	0.054
Age group				
<40 years	1		1	
>40 years	1.951 (1.652:2.303)	<0.001	1.410 (1.155:1.722)	0.001
Schooling				
>5 years	1		1	
<5 years	1.455 (1.244:1.702)	<0.001	1.113 (0.943:1.313)	0.205
Work				
<44 hours/week	1		1	
>44 hours/week	1.047 (0.858:1.278)	0.653		
Sleep quality				
Good quality	1		1	
Regular	1.364 (1.171:1.589)	<0.001	1.125 (0.971:1.303)	0.116
Poor	1.669 (1.427:1.952)	<0.001	1.266 (1.061:1.509)	0.009
Physical activity				
>150 min	1		1	
<150 min	1.187 (0.989:1.425)	0.066	1.193 (0.991:1.435)	0.062
Sedentary behavior				
<3 hours/day	1		1	
>3 hours/day	1.087 (0.855:1.383)	0.494		
Self-reported health				
Positive	1		1	
Regular	1.627 (1.392:1.902)	<0.001	1.424 (1.210:1.675)	<0.001
Negative	2.290 (1.948:2.693)	<0.001	1.552 (1.281:1.879)	<0.001
Arthritis/Rheumatism				
No	1		1	
Yes	1.695 (1.494:1.924)	<0.001	1.097 (0.953:1.264)	0.198
Dort				
No	1		1	
Yes	1.891 (1.690:2.117)	<0.001	1.509 (1.314:1.733)	<0.001
Locomotor disability				
No	1		1	
Yes	1.737 (1.539:1.961)	<0.001	1.294 (1.129:1.485)	<0.001
% fat				
Not obese	1		1	
Obese	1.133 (0.979:1.311)	0.095	0.944 (0.797:1.119)	0.508

PR: Prevalence ratio; 95%CI: confidence interval of 95%; 1: p-value of crude analysis; 2: p-value of saturation analysis.

## DISCUSSION

The main findings of this study indicate that more than half of quilombola adults presented CSP/BK significantly associated with age group, sleep quality, self-reported health, diagnosis of Dort and motor disabilities. There is a chance of this being the first study analyzing a representative sample of quilombola population in this region of the Brazilian state.

The CSP/BP decrease physical capacity and social contact, increase stress and anxiety, labour and financial problems, besides representing losses in treatment costing, sick pay and disability retirement<sup>3,7</sup>, generating personal, social and economic problems.

The prevalence of CSP/BP in this study is higher than the 18.5% found for the Brazilian population<sup>2</sup> and the 39.3% for quilombolas of a city of Bahia<sup>8</sup>. This high prevalence of CSP/BP in quilombolas may stem from early initiation in jobs that require high physical effort since childhood, a time when the skeletal structure is still under development<sup>18</sup>.

This analysis corroborates with other populational studies as it shows higher prevalence of CSP/BP among older patients<sup>2,8</sup>, even after sex stratification<sup>7</sup>. It is known that aging leads to functional and motor changes in the musculoskeletal system, changing individual's anatomical structure and motor performance<sup>19</sup>, negatively affecting flexibility and consequently increasing articulation problems<sup>20</sup>. Hence, the aging process requires better monitoring of access and use of health services by people with chronic non-communicable diseases (NCD), for the adequate planning of emergent demands<sup>6</sup>.

Sleep is essential in the life of human beings. There is a strong association between sleep disturbances and various diseases, given the intensification of musculoskeletal tensions. Which allows us to understand the association between the CSP/BP and the poor quality of sleep in quilombola adults, since this condition triggers negative organic symptoms of physical and/or cognitive origin, such as pains that hinder daily life activities.

As found in quilombolas, a representative study in Brazilian adults<sup>7</sup> and a survey with predominantly caucasian population also observed association between worse self-reported health and BP<sup>9</sup>. This situation recognizes the interrelation between the presence of diseases with worse self-reported health, and that the negative perception of health increases in parallel with multimorbidity<sup>5</sup>.

The excessive use of the musculoskeletal system caused by repetitive movements and the continuous use of muscles or muscle groups, does not allow their full recovery, which causes Dort<sup>23</sup>. National survey on Brazilian adults also identified association between the CSP/BP and Dort<sup>2</sup>, which corroborates with our findings. This association is particularly worrisome given the possibility of worsening the vulnerability among the affected individuals and their families considering the socioeconomic demand for treatments<sup>24</sup>, mainly in those with multimorbidities<sup>6</sup>.

We found no studies on the association between motor disability and CSP/BP. However, recognizing chronic pain as a frequent morbidity and functional disability condition<sup>25</sup> can explain the association identified in this study with quilombolas.

NCD's are known for having multiple aetiology, many risk factors and long periods of latency, prolonged course, non-infectious origin and for its association with disabilities and functional disabilities.

One of the limitations of this study was the possibility of superestimating the prevalence of the investigated outcome, as issues such as participants' perception and the access to health services may interfere in morbidity<sup>2</sup>. Another limitation of our study was inherent to its cross-sectional character, which did not allow us to establish a relation between exposure and outcome. However, studies with this design are robust tools that allow us to describe the life and health conditions in specific populations<sup>26</sup>.

As its main advantage, this study brought relevant information regarding the postural health situation of a quilombola population who lived in a wide geographical region distant from economic and population centers of Bahia, thus being generally neglected by health services and academics. Population surveys, as the one presented, contribute to the public health policies setting based on the demands of the profile of participants<sup>26</sup>.

## CONCLUSION

The results indicate a high prevalence of CSP/BP in the participant quilombola population strongly associated with lifestyle and modifiable health (quality of sleep, self-reported health and Dort). This way, implementing strategies that consider the specific demands of the quilombola population will allow us to better prevent the worsening of morbidities.

These findings reinforce the importance of screening CSP/BK, highly prevalent NCD, as an useful mechanism

to support specific health policies for rural black population, possibly more exposed to the group of diseases under study. Thus, the training of health professionals in the region can positively impact the health care of quilombolas.

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