

Quality of life in an urban quilombola community

Qualidade de vida numa comunidade quilombola urbana

Calidad de vida en una comunidad quilombola urbana

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ABSTRACT This study aimed to evaluate the quality of life and associated factors among residents of the Quilombo de Quingoma, in the municipality of Lauro de Freitas, Bahia, Brazil. Despite official certification, this quilombo has experienced territorial expropriation driven by urban expansion projects, resulting in social conflict and environmental change. A census-based study included 318 residents aged 18 years and older, who completed a questionnaire addressing sociodemographic, housing, occupational, and health characteristics, as well as the WHOQOL-Bref for quality-of-life assessment. Multiple linear regression models showed that Physical domain scores were higher among quilombolas engaged in formal or informal employment and lower among those reporting Evangelical affiliation and illness. Psychological domain scores were higher among individuals with higher monthly income and lower among those reporting dust exposure and illness. The Social Relations domain was positively associated with age and negatively associated with perceived risk of deforestation. The Environmental domain was positively associated with age and income, higher among those reporting a lack of household sewage and fear of losing land or housing, and lower among those reporting illness. The limited literature on WHOQOL-Bref-based quality-of-life assessment in Brazilian quilombola communities hindered interpretation and comparison of findings.

KEYWORDS Quilombola communities. Risk groups. Quality of life.

RESUMO Objetivou-se avaliar a qualidade de vida e fatores associados de moradores do quilombo Quingoma, Lauro de Freitas, Bahia. Embora certificado pela Fundação Cultural Palmares, o quilombo vem sendo expropriado do seu território por projetos de desenvolvimento para expansão urbana que causam conflitos sociais e modificações ambientais. Um estudo censitário identificou 318 moradores maiores de 18 anos, que responderam a um questionário sobre aspectos sociodemográficos, habitacionais, ocupacionais, sanitários e ao WHOQOL-Bref para avaliar sua qualidade de vida. Modelos de regressão linear múltipla estimaram que o escore médio do domínio Físico foi mais alto em quilombolas com emprego formal e informal e mais baixo naqueles que referiram religião evangélica e estar doentes; o domínio Psicológico foi mais alto naqueles com maior renda mensal e mais baixo nos que referiram risco de poeiras e estar doentes; o domínio Social associou-se positivamente à idade e foi mais baixo naqueles que referiram risco de desmatamento; o domínio Ambiental foi mais alto naqueles com mais idade, maior renda, que referiram ausência de esgotamento sanitário e receavam perder terra/casa; e mais baixo nos que declararam estar doentes. A escassa literatura sobre qualidade de vida avaliada pelo questionário WHOQOL-Bref em comunidades quilombolas brasileiras dificultou melhor avaliação desses resultados.

PALAVRAS-CHAVE Quilombolas. Grupos de risco. Qualidade de vida.

RESUMEN El objetivo fue evaluar la calidad de vida y los factores asociados de los residentes del quilombo Quingoma, Lauro de Freitas, Bahía. Un estudio censal identificó a 318 residentes mayores de 18 años, que respondieron un cuestionario sobre aspectos sociodemográficos, de vivienda, ocupacionales y sanitarios, y el WHOQOL-Bref para evaluar su calidad de vida. Los modelos de regresión lineal múltiple estimaron que el puntaje promedio en el dominio Físico fue más alto en los quilombolas con empleo formal e informal y más bajo en aquellos que reportaron religión evangélica y estar enfermos; el dominio Psicológico fue más alto en aquellos con mayores ingresos mensuales y más bajo en aquellos que reportaron riesgo de polvo y estar enfermos; el dominio Social se asoció positivamente con la edad y fue más bajo en aquellos que reportaron riesgo de deforestación; el dominio Ambiental fue más alto entre aquellos que eran mayores, tenían mayores ingresos, reportaron falta de saneamiento y tenían perder su tierra/hogar; y los valores más bajos se registraron entre quienes reportaron estar enfermos. La escasa bibliografía sobre la calidad de vida evaluada mediante el cuestionario WHOQOL-Bref en comunidades quilombolas brasileñas dificultó una mejor evaluación de estos resultados.

PALABRAS CLAVE Quilombolas. Grupos de riesgo. Calidad de vida.

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Introduction

Traditional communities are culturally distinct groups that occupy and use their territories and natural resources to sustain their cultural, social, economic, religious, and ancestral ways of life, drawing on knowledge and practices passed down through generations. In these communities, relationships with nature differ fundamentally from those characteristics of urban life¹. The 1988 Brazilian Constitution recognized the right of quilombola remnants to definitive ownership of the lands they occupy. In accordance with current legislation, the State is legally required to identify, recognize, delimit, demarcate, and grant title to lands occupied by remnant quilombo communities². Data from the 2022 Demographic Census indicate that 1,327,802 quilombola individuals live in 7,666 communities across 1,696 municipalities, in 24 states and the Federal District, accounting for 0.65% of the Brazilian population³.

Over time, the quilombo community of Quingoma, located in the municipality of Lauro de Freitas, Bahia, has undergone progressive territorial dispossession driven by development projects associated with urban expansion. This process has generated multiple environmental conflicts and territorial disputes with multiple impacts on the health and quality of life of quilombola residents⁴. These dynamics have transformed the local landscape, disrupted traditional habits and ways of life, and resulted in violations of rights related to land and territory, the environment, and cultural preservation. In the Quilombo of Quingoma, structural inequalities, infringements of territorial rights, and the social determination of low levels of health and quality of life are clearly evident⁵. This study is also justified by the limited availability of research addressing the quality of life in quilombola communities.

This study aimed to assess the quality of life and associated factors among residents of the Quilombo of Quingoma, in Lauro de Freitas, Bahia.

Material and methods

A cross-sectional, census-based descriptive study was conducted among residents of Quingoma de Dentro, in the Quilombo of Quingoma, municipality of Lauro de Freitas, Bahia. Quingoma has been officially recognized as a quilombo remnant since March 22, 2013, by the Fundação Cultural Palmares⁶, under registration number 1909 and IBGE code 2919207, alongside other 3,382 certified communities. Despite this recognition, the community continues to pursue the completion of the legal titling process for its territory, while remaining actively engaged in the preservation of traditional practices. Access to health services is limited, even with the Metropolitan Hospital located nearby. Primary care is provided by a Family Health Unit in a neighboring district. Local mobility relies on a private cooperative of informal transport vehicles (*carrinhos*), which connect residents to the Estrada do Coco highway, and, more recently, on bus routes operating at staggered times to the Aeroporto metro station. Nonetheless, land tenure conflicts and resistance to real estate speculation within the quilombo territory remain the dominant local issues⁵.

Data collection took place between June and August 2024 as part of a broader study conducted from June to November 2024 by a trained team of six members—comprising two supervising professors, two researchers, and two research assistants.

An active household survey was conducted across Quingoma de Dentro, one of the three areas that make up the Quilombo of Quingoma, to identify the study population. All residents encountered during field visits were considered eligible, regardless of self-identification as quilombola. Households identified during mapping but with residents not reached during data collection were excluded. Participants were grouped by place of residence into four areas: Rua Dejanira Maria Bastos and surrounding areas (n = 98), Rua Santo Amaro de Ipitanga and surrounding areas (n = 76), Rua

Eliane Barbosa and surrounding areas ($n = 45$), and Pandeirão and surrounding areas ($n = 99$), resulting in a final sample of 318 residents.

After clarification of study objectives and procedures, written informed consent (TCLE) was obtained, and interviews were conducted in participants' homes, lasting approximately 30 minutes. The questionnaire included socioeconomic and demographic variables (age, self-reported race/color, sex, monthly income, access to social benefits, marital status, length of residence in the quilombo, and number of household members). It also assessed perceived risk of losing housing or land and perceptions of environmental hazards, including dust exposure, fires, river pollution, landscape change, deforestation, large-scale development projects, and lack of sanitation infrastructure. Health status was operationalized through a composite variable ('Ill'), coded as positive when participants reported at least one of the following conditions: arterial hypertension, diabetes, depression, respiratory disease, heart disease, sickle cell anemia, or chronic pain. These conditions were selected due to their severity and documented prevalence in quilombola populations.

Quality of life was assessed using the WHOQOL-Bref instrument. The questionnaire comprises 26 questions, of which the first two assess the overall perception of quality of life and satisfaction with health. The remaining 24 questions are distributed across four domains: Physical, Psychological, Social Relationships, and Environment. Responses are recorded on a five-point Likert scale, allowing the calculation of domain-specific scores. After standard transformation procedures, scores range from 0 to 100, with higher values indicating better quality of life^{7,8}.

Data analysis was performed using SPSS software⁹.

Instrument reliability was assessed using the Composite Reliability (CR) index. Values of $CR \geq 0.70$ indicate good reliability, $0.60 \leq CR < 0.70$ suggest acceptable but improvable consistency, and $CR < 0.60$ indicates low

reliability¹⁰. Some authors consider CR values above 0.70¹¹, or even above 0.60¹², as acceptable indicators of internal consistency. To assess the suitability of the WHOQOL-Bref for the quilombola population, exploratory factor analysis was conducted using JASP software (version 0.17.3)¹³. Data adequacy for factor analysis was evaluated using the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity¹⁴.

Associations between continuous variables (age, years living in the quilombo, and number of household members) and WHOQOL-Bref domain scores were assessed using Pearson's correlation coefficient (r). Variables with $r > 0.10$ were selected for inclusion in four multiple linear regression models, with the Physical, Psychological, Social Relationships, and Environment domains as dependent variables. For categorical variables, inclusion in the models was based on a mean ratio ≥ 1.05 between strata.

Multiple linear regression models were estimated using the ENTER method. Cases with standardized residuals exceeding ± 3 standard deviations were excluded from the respective models. Residual diagnostics included two types of scatterplots for each dependent variable: (a) standardized residuals versus expected cumulative probability, and (b) standardized residuals versus standardized predicted values.

Given the non-probabilistic sampling design, statistical inference to the target population was not performed. Multiple linear regression was used solely to estimate crude and standardized regression coefficients (BETA coefficients), obtained after standardizing variables into Z-scores before model fitting, for descriptive purposes only. Standardized BETA coefficients allow direct comparison among predictors included in the model, as they are independent of the measurement scales of the variables⁹.

This study was approved by the Human Research Ethics Committee of the School of Medicine of Bahia, Federal University

of Bahia (UFBA), under opinion number 6,830,409, dated May 16, 2024 (CAAE 79664024.4.0000.5577).

Results

The 318 participants responded to the first two WHOQOL-Bref items as follows. For the question ‘How would you rate your quality of life?’, responses were distributed as: very poor (2.8%), poor (2.2%), neither poor nor good

(32.7%), good (45.9%), and very good (16.4%), with a mean score of 3.7 ± 0.9 and a median of 4. For the question ‘How satisfied are you with your health?’, responses were: very dissatisfied (4.1%), dissatisfied (6.9%), neither satisfied nor dissatisfied (22.0%), satisfied (54.1%), and very satisfied (12.4%), also with a mean score of 3.7 ± 0.9 and a median of 4.

Descriptive statistics for the four WHOQOL-Bref domains are presented in table 1.

Statistic	Domain			
	Physical	Psychological	Social relationships	Environment
Mean ± standard deviation	60.9±17.9	65.8±15.7	61.4±21.9	42.7±15.8
Median	60.7	66.7	66.7	40.6
Minimum–maximum	11-100	21-100	0-100	3-81
Composite Reliability Index (CRI)	0.858	0.804	0.752	0.846

Source: Authors’ elaboration.

The WHOQOL-Bref domain scores showed good internal consistency, as assessed by the Composite Reliability index. Reliability coefficients were as follows: Physical = 0.858; Psychological = 0.804; Social = 0.752; and Environmental = 0.846 (table 1). The overall Kaiser–Meyer–Olkin (KMO) measure was 0.834, indicating good sampling adequacy for Factor Analysis according to Kaiser and Rice¹⁵, who consider values above 0.80 as indicative of a suitable correlation matrix for this type of analysis. Bartlett’s Test of Sphericity yielded a chi-square value of 2091.383 (df = 325, p < 0.001), indicating that the correlation matrix significantly differs from an identity matrix and confirming sufficient inter-item correlations to justify conducting Factor Analysis¹⁴. Model fit was evaluated using five fit indices. The Root Mean Square Error of Approximation (RMSEA) was 0.037, with a 90% confidence

interval of 0.027–0.047, indicating good model fit according to Browne and Cudeck¹⁶, who suggest values below 0.05 reflect very good model fit. The Standardized Root Mean Square Residual (SRMR) was 0.035, within the acceptable threshold of 0.08. Incremental fit indices also indicated good model fit, with a Tucker–Lewis Index (TLI) of 0.917 and a Comparative Fit Index (CFI) of 0.949, both above the 0.90 threshold, supporting adequate model fit¹⁷.

Bivariate analyses for variable selection in multiple linear regression models

Physical domain scores were strongly associated with the following variables: sex, religion, employment status, monthly income, and receipt of social benefits (table 2), as well

as number of household members (*table 3*), perceived risk of dust exposure and fires, fear of losing land or housing, and health status (*table 4*).

Table 2. Mean ratio (MR) of quality-of-life domain scores (mean $\pm$ standard deviation) according to sociodemographic and occupational characteristics of residents of the Quingoma quilombo, Lauro de Freitas, Bahia, 2024

Characteristics ^a	n	%	Physical (x $\pm$ dp)	MR	Psychological (x $\pm$ dp)	MR	Social (x $\pm$ dp)	MR	Environmental (x $\pm$ dp)	MR
Sex				1.12		1.09		1.02		1.15
Female	169	53.1	57.8 $\pm$ 18.2		63.2 $\pm$ 16.3		60.8 $\pm$ 22.3		39.9 $\pm$ 15.7	
Male	149	46.9	64.8 $\pm$ 18.2		68.8 $\pm$ 14.5		62.0 $\pm$ 21.4		45.7 $\pm$ 15.3	
Self-reported race/skin color				1.03		1.04		1.01		1.01
White/Asian	25	7.8	61.7 $\pm$ 20.2		68.5 $\pm$ 17.8		62.0 $\pm$ 24.6		43.0 $\pm$ 18.4	
Black/Mixed race	293	92.2	60.0 $\pm$ 15.5		65.7 $\pm$ 14.4		61.3 $\pm$ 21.6		42.6 $\pm$ 15.5	
Education				1.03		1.03		1.04		1.03
Up to lower secondary education	147	46.3	59.1 $\pm$ 16.8		64.8 $\pm$ 16.0		60.1 $\pm$ 24.4		41.9 $\pm$ 16.3	
Upper secondary/higher education	171	53.7	61.1 $\pm$ 15.1		66.9 $\pm$ 13.5		62.5 $\pm$ 19.3		43.3 $\pm$ 15.3	
Marital status				1.00		1.04		1.09		1.07
Single	199	62.6	60.1 $\pm$ 15.7		64.9 $\pm$ 14.9		59.4 $\pm$ 22.1		41.6 $\pm$ 15.4	
Married	119	37.4	60.3 $\pm$ 16.3		67.7 $\pm$ 14.3		64.7 $\pm$ 21.1		44.4 $\pm$ 16.2	
Religion										
Catholic/Spiritualist	86	27.0	61.9 $\pm$ 14.4	1.10	69.5 $\pm$ 13.0	1.15	62.2 $\pm$ 22.6	1.09	44.3 $\pm$ 15.8	1.08
Evangelical	121	38.0	56.3 $\pm$ 16.9	-	65.9 $\pm$ 14.6	1.05	64.5 $\pm$ 22.0	1.13	42.1 $\pm$ 15.5	1.02
Afro-Brazilian religions	9	2.8	62.7 $\pm$ 19.7	1.11	68.5 $\pm$ 11.2	1.09	62.1 $\pm$ 15.6	1.09	48.9 $\pm$ 14.4	1.18
No religion	102	32.2	63.0 $\pm$ 14.8	1.12	62.9 $\pm$ 15.8	-	57.0 $\pm$ 21.3	-	41.3 $\pm$ 16.1	-
Quilombola identity				1.03		1.01		1.14		
Yes	273	85.8	60.6 $\pm$ 18.0		65.6 $\pm$ 15.6		60.2 $\pm$ 21.3		42.7 $\pm$ 15.7	1.02
No	45	14.2	62.5 $\pm$ 17.6		66.5 $\pm$ 16.2		68.3 $\pm$ 23.8		42.0 $\pm$ 16.2	
Employment										
Formal employment	49	15.4	63.5 $\pm$ 14.8	1.16	71.1 $\pm$ 12.9	1.12	65.3 $\pm$ 21.4	1.11	48.3 $\pm$ 15.5	1.20
Informal employment	123	38.7	65.1 $\pm$ 13.6	1.19	67.0 $\pm$ 14.4	1.06	63.0 $\pm$ 20.0	1.07	43.3 $\pm$ 15.8	1.08
Other	146	45.9	54.8 $\pm$ 16.4	-	63.4 $\pm$ 15.0	-	58.7 $\pm$ 23.2	-	40.2 $\pm$ 15.3	-
Monthly income (minimum wages)				1.08		1.11				1.23
< 2 minimum wages	251	78.9	59.2 $\pm$ 15.6		64.5 $\pm$ 14.8		61.1 $\pm$ 22.2	1.03	40.7 $\pm$ 15.3	
$\geq$ 2 minimum wages	67	21.1	63.9 $\pm$ 16.5		71.5 $\pm$ 12.9		62.7 $\pm$ 21.0		50.1 $\pm$ 15.6	
Receives social benefits				1.07		1.04		1.03		1.08
Yes	119	37.4	57.8 $\pm$ 15.7		64.4 $\pm$ 15.3		60.2 $\pm$ 22.8		40.6 $\pm$ 15.9	
No	199	62.6	61.6 $\pm$ 15.9		66.9 $\pm$ 14.3		62.2 $\pm$ 21.3		43.9 $\pm$ 15.6	

Source: Authors' elaboration.

^a The reference stratum was defined as the category with the lowest mean score for each variable.

Table 3. Pearson correlation coefficients between quality-of-life domain scores and age (years), years of residence in the quilombo, and number of household members among residents of the Quingoma quilombo, Lauro de Freitas, Bahia, 2024

Characteristics	Physical	Psychological	Social	Environmental
Age (years)	-0.05	0.15	0.23	0.16
Years of residence in the quilombo	0.07	-0.00	0.05	0.01
Household members	-0.12	-0.16	-0.10	-0.17

Source: Authors' elaboration.

Table 4. Mean ratio (MR) of quality-of-life domain scores (mean $\pm$ standard deviation) according to environmental risks and self-reported health status among residents of the Quingoma quilombo, Lauro de Freitas, Bahia, 2024

Perceived environmental risks ^a	N	%	Physical (x $\pm$ dp)	MR	Psychological (x $\pm$ dp)	MR	Social (x $\pm$ dp)	MR	Environmental (x $\pm$ dp)	MR
Dust exposure				1.07		1.09		1.04		1.09
Yes	171	53.8	58.9 $\pm$ 16.9		63.1 $\pm$ 14.4		60.4 $\pm$ 20.8		40.9 $\pm$ 14.5	
No	147	46.2	63.2 $\pm$ 18.9		68.9 $\pm$ 16.6		62.6 $\pm$ 23.0		44.6 $\pm$ 16.9	
Fires (slash-and-burn practices)				1.05		1.04		1.09		1.11
Yes	216	67.9	59.9 $\pm$ 17.2		65.0 $\pm$ 15.4		59.7 $\pm$ 22.2		41.2 $\pm$ 15.0	
No	102	32.1	62.9 $\pm$ 19.4		67.3 $\pm$ 16.3		65.1 $\pm$ 20.8		45.8 $\pm$ 16.9	
River pollution				1.04		1.00		1.02		1.01
Yes	65	20.4	58.9 $\pm$ 20.1		65.6 $\pm$ 15.7		62.4 $\pm$ 21.6		42.5 $\pm$ 15.0	
No	253	79.6	61.4 $\pm$ 17.4		65.8 $\pm$ 15.8		61.1 $\pm$ 21.9		42.7 $\pm$ 16.0	
Landscape change				1.01		1.01		1.05		1.04
Yes	67	21.1	60.4 $\pm$ 19.3		65.5 $\pm$ 17.7		61.6 $\pm$ 21.5		41.2 $\pm$ 16.4	
No	251	78.9	61.0 $\pm$ 17.4		65.8 $\pm$ 15.2		61.3 $\pm$ 22.0		43.0 $\pm$ 15.6	
Deforestation				1.02		1.00		1.05		1.06
Yes	114	35.8	61.7 $\pm$ 16.9		65.9 $\pm$ 14.0		63.3 $\pm$ 20.8		44.3 $\pm$ 13.8	
No	204	64.2	60.4 $\pm$ 18.5		65.7 $\pm$ 16.6		60.3 $\pm$ 22.4		41.7 $\pm$ 16.7	
Large-scale enterprises				1.03		1.07		1.03		1.05
Yes	58	18.2	59.7 $\pm$ 14.9		62.3 $\pm$ 14.7		63.1 $\pm$ 19.6		44.3 $\pm$ 12.0	
No	260	81.7	61.2 $\pm$ 18.6		66.5 $\pm$ 15.8		61.0 $\pm$ 22.4		42.3 $\pm$ 16.5	
Lack of a sanitation system				1.01		1.07		1.02		1.09
Yes	118	37.1	61.3 $\pm$ 16.6		65.2 $\pm$ 15.9		62.0 $\pm$ 19.9		44.9 $\pm$ 14.2	
No	200	62.9	60.6 $\pm$ 18.7		66.1 $\pm$ 15.6		61.0 $\pm$ 22.9		41.3 $\pm$ 16.5	

Table 4. Mean ratio (MR) of quality-of-life domain scores (mean $\pm$ standard deviation) according to environmental risks and self-reported health status among residents of the Quingoma quilombo, Lauro de Freitas, Bahia, 2024

Perceived environmental risks ^a	N	%	Physical ($\bar{x} \pm dp$)	MR	Psychological ($\bar{x} \pm dp$)	MR	Social ($\bar{x} \pm dp$)	MR	Environmental ($\bar{x} \pm dp$)	MR
Fear of losing land/home				1.05		1.03		1.09		1.13
Yes	172	54.0	59.6 $\pm$ 17.8		65.0 $\pm$ 14.8		58.9 $\pm$ 21.9		40.2 $\pm$ 14.3	
No	146	46.0	62.5 $\pm$ 18.0		66.6 $\pm$ 16.7		64.4 $\pm$ 21.4		45.4 $\pm$ 17.0	
Health status				1.09		1.07		1.01		1.13
Ill ^b	124	39.0	56.9 $\pm$ 16.2		63.2 $\pm$ 14.8		61.0 $\pm$ 22.5		39.4 $\pm$ 14.6	
Not ill	194	61.0	62.2 $\pm$ 15.4		67.7 $\pm$ 14.4		61.6 $\pm$ 21.4		44.7 $\pm$ 16.2	

Source: Authors' elaboration.

^a The reference stratum was the one with the lowest mean score for each variable.^b Diabetes, hypertension, heart disease, respiratory disease, depression, sickle cell disease, and/or chronic pain condition.

Psychological domain scores were strongly associated with sex, religion, employment status, and monthly income (*table 2*), as well as age and number of household members (*table 3*), and perceived risk of dust exposure, risk of large-scale development projects, lack of sewage infrastructure, and health status (*table 4*).

Social domain scores were strongly associated with marital status, religion, self-identification as quilombola, and employment status (*table 2*), as well as age and number of household members (*table 3*), and perceived risk of fires, landscape change, deforestation, as well as fear of losing land or housing (*table 4*).

Environmental domain scores were strongly associated with sex, marital status, religion, employment status, monthly income, and receipt of social benefits (*table 2*), as well as age and number of household members (*table 3*), and perceived risk of dust exposure, fires, large-scale development projects, and deforestation, lack of sewage infrastructure, fear of losing land or housing, and health status (*table 4*).

Overall, 39.0% of the population reported being in 'ill' health. The prevalence of each of the seven conditions included in this variable

was as follows: hypertension (21.7%), diabetes (10.7%), depression (6.3%), respiratory disease (5.7%), heart disease (2.5%), sickle cell anemia (4.1%), and chronic pain (4.1%).

Multiple linear regression analyses

The multiple linear regression model showed that the mean Physical domain score was 8.091 points higher among participants reporting informal employment and 7.079 points higher among those with formal employment, compared with unemployed individuals. Participants reporting an Evangelical religion had mean Physical domain scores 5.407 points lower than those reporting no religion. Individuals reporting at least one chronic condition (diabetes, arterial hypertension, heart disease, respiratory disease, depression, sickle cell anemia, or chronic pain) had Physical domain scores 3.929 points lower than those without such conditions. Among all variables included in the model, informal employment showed the strongest contribution to variation in Physical domain scores, as indicated by its standardized BETA coefficient of 0.254 (*table 5*).

Table 5. Unstandardized and standardized regression coefficients from multiple linear regression models, with the four WHOQOL-BREF quality-of-life domains as dependent variables, according to predictor variables among residents of the Quingoma quilombo, Lauro de Freitas, Bahia, Brazil, 2024

Predictor (reference)	Physical (n=317)			Psychological (n=314)			Social (n=318)			Environmental (n=317)		
	b	b _(EP)	BETA	b	b _(EP)	BETA	b	b _(EP)	BETA	b	b _(EP)	BETA
Age (years)				0.038	0.060	0.041	0.385	0.087	0.265	0.153	0.065	0.147
Sex (female)	0.819	2.141	0.026	1.044	1.833	0.037				2.109	2.074	0.067
Quilombola identity (no)							-5.124	3.474	-0.082			
Number of household members	-0.666	0.558	-0.068	0.977	0.533	-0.110				-1.117	0.579	-0.113
Single/divorced/widowed (married/cohabiting)							3.924	2.482	0.087	3.249	1.764	0.100
Formal employment (no)	7.079	2.710	0.165	4.397	2.395	0.114	6.657	3.523	0.110	3.176	2.624	0.086
Informal employment (no)	8.091	2.102	0.254	0.772	1.881	0.027	4.075	2.580	0.091	-0.540	2.041	-0.017
Monthly income $\geq$ 2 MW (< 2 MW)	2.165	2.176	0.057	5.600	1.959	0.163				7.640	2.157	0.198
Receives social benefits (no)	1.530	2.021	0.048							0.926	2.005	0.029
Evangelical religion (no)	-5.407	2.004	-0.177	3.287	1.893	0.114	4.364	2.902	0.097	-0.696	2.011	-0.022
Catholic/Spiritist religion (no)	-2.292	2.283	-0.063	3.223	2.206	0.103	-1.840	3.387	-0.037	-0.833	2.379	-0.024
Afro-Brazilian religions (no)	-2.438	5.466	-0.026	1.799	4.940	0.021	-7.769	7.639	-0.059	2.538	5.352	0.027
Perceives dust exposure risk (no)	-2.360	1.910	-0.076	-4.512	1.702	-0.161				-3.780	1.994	-0.120
Perceives deforestation risk (no)							5.667	2.636	0.125	3.078	1.909	0.094
Perceives lack of sanitation services (no)				-0.157	1.836	-0.005				6.344	1.981	0.196
Perceives fire risk (no)	-0.753	2.080	-0.023				-3.899	2.708	-0.083	-1.021	2.072	-0.030
Perceives landscape change risk (no)							-0.169	3.021	-0.003			
Perceives risk from large-scale enterprises (no)				0.254	2.212	0.007				-0.722	2.564	-0.018
Fear of losing land/home (no)	1.100	1.735	0.035				4.956	2.480	0.113	5.153	1.712	0.164
Illness (no)	-3.929	1.815	-0.123	-4.234	1.679	-0.148				-6.045	1.784	-0.188
Constant	61.220	4.336	-	67.118	3.567	-	39.084	9.247	-	30.278	5.153	-
ANOVA			< 0.001			< 0.001			< 0.001			< 0.001
Tolerance (1 - R ²)			0.591-0.904			0.575-0.868			0.595-0.933			0.589-0.867
Durbin-Watson			1.653			1.946			2.034			1.801
Adjusted R ²			0.153			0.113			0.104			0.188

Source: Authors' elaboration.

b - Unstandardized regression coefficient; b_(EP) - standard error of b; BETA - standardized regression coefficient.

For the Psychological domain, the most influential predictors ($B \geq |0.12|$) were monthly income, perceived risk of dust exposure, and health status. The model estimated that the mean Psychological domain score was 5.600 points higher among individuals with a monthly income ≥ 2 minimum wages compared with those earning < 2 minimum wages. Lower mean scores were observed among individuals reporting perceived risk of dust exposure (-4.512 points) and those reporting poor health status (-4.234 points), compared with their respective reference groups (*table 5*).

Variation in Social domain scores was positively associated with age, with an estimated increase of 0.347 points per year of life ($B = 0.265$). In this domain, individuals reporting perceived risk of deforestation had higher mean scores (5.667 points) than those who did not report such perception (*table 5*).

Environmental domain scores were positively associated with age and were higher among individuals reporting higher monthly income, perceived risk of lack of sewage infrastructure in the quilombo, and feared losing land or housing. Conversely, reporting poor health status was strongly and negatively associated with Environmental domain scores, with an estimated reduction of 6.045 points compared with those not reporting illness (*table 5*).

Observations with studentized residuals exceeding ± 3 standard deviations were excluded from the models for the Physical (one case: -3.694), Psychological (four cases: -3.036 , -3.093 , -3.631 , and -3.665), and Environmental (one case: -3.199) domains. Residual diagnostics indicated satisfactory distributional behavior and acceptable normality assumptions. Overall, the regression models showed adequate fit across all four WHOQOL-Bref domains (Physical, Psychological, Social, and Environment), meeting the assumptions of multiple linear regression and presenting ANOVA p -values < 0.001 . Collinearity diagnostics, assessed using Tolerance values, ranged from 0.575 to 0.933 across the four

models, indicating no relevant collinearity among predictors. Adjusted R^2 values ranged from 0.104 to 0.188 (*table 5*).

The Durbin-Watson statistic assesses autocorrelation in regression model errors. In this study, Durbin-Watson values ranged from 1.653 to 2.034 across the four multiple linear regression models, remaining within the acceptable range of 1.500 to 2.500 (*table 5*), indicating no evidence of residual autocorrelation (*table 5*).

Among the 318 residents, 93.7% reported the public supply network (EMBASA) as their main source of drinking water. Wastewater disposal occurred predominantly through rudimentary septic pits (83.0%). Most participants reported access to waste collection services (82.7%), owned their homes (75.8%), and lived in masonry dwellings (86.5%). A minority reported using backyard toilets as their only form of sanitation (15.1%), and 6.0% reported seeking care in private health services (data not shown in tables).

Discussion

The general characteristics of the study population—predominantly self-reported Black or Brown individuals, mostly female, and with a high prevalence of chronic conditions—are consistent with findings from other studies conducted in quilombola communities¹⁸⁻²⁰.

Comparisons of quality of life results with those reported in the literature were substantially limited by methodological differences and variations in study populations. The Quingoma study was a census covering all residents aged 18 years or older. In contrast, previous WHOQOL-Bref studies in quilombola populations have included specific subgroups, such as older adults aged 60 years or older^{18,21}, broader age ranges (14–81 years)²², or have not reported results for the full population, presenting only stratified analyses by sex²⁰⁻²². Other studies adopted different analytical approaches, including case-control designs

on arterial hypertension, reporting quality of life using medians rather than means²³, or presenting stratified results by metabolic syndrome¹⁹, or by sex, education, age group, and retirement status²⁰.

The mean score for WHOQOL-Bref Question 1 ('How would you rate your quality of life?') was 3.71, falling between the response categories 'neither poor nor good' and 'good'. For Question 2 ('How satisfied are you with your health?'), the mean score was 3.65, positioned between 'neither satisfied nor dissatisfied' and 'satisfied'. These results suggest a moderately positive perception of quality of life and health satisfaction among quilombo residents. Studies using the WHOQOL-Bref in quilombola populations¹⁸⁻²³ have not reported these two items in a way that allows direct comparison.

Each of the four WHOQOL-Bref domains measures distinct constructs with specific means and variances; therefore, domain scores should not be directly compared with one another. This methodological error has been observed in some studies involving quilombola populations^{18,21,22}.

A study involving 327 individuals from two quilombola communities in the state of Sergipe reported higher scores across all four WHOQOL-Bref domains compared with those observed in Quingoma, indicating better quality of life. In that study, bivariate analyses showed that the Physical domain was associated with age over 50 years, low educational level, and retirement or pension status; the Psychological domain was associated with low education and retirement or pension status; and the Environmental domain was associated with age over 50 years and retirement or pension status²⁰.

Formal employment, compared with unemployment, was an important factor in explaining variation in the Physical and Social quality-of-life scores among quilombolas. By offering greater income stability, improved access to health services, wider opportunities for social interaction, and a more structured

daily routine with regular meals and sleep, formal employment appears to contribute positively to quality of life in these communities.

Identifying as Evangelical was associated with lower average scores in the Physical domain, indicating less favorable physical quality of life among Evangelical quilombolas compared with those reporting no religious affiliation. In bivariate analyses, Evangelicals scored 6.7 percentage points below the reference group (63.0% versus 56.3%); after adjustment for the remaining variables in the model, this difference was reduced to -5.407. Additional bivariate analyses (not shown) indicated that the crude 6.7-point gap was not explained by variables excluded from the model, such as educational attainment, self-identification as quilombola, or length of residence in the community. The multivariate analysis did not include interaction terms, including first-order interactions, which may have contributed to the unexplained lower scores observed among Evangelicals. Interpretation of WHOQOL-Bref domain scores would benefit from well-established thresholds for the Minimal Clinically Important Difference (MCID). MCID is defined as the smallest change or difference considered important by the patient or by the evaluator²⁴, whether a physician, physiotherapist, or social researcher. Among patients with advanced lung cancer, estimated MCID values by WHOQOL-Bref domain are 1.545 for the Physical domain, 1.259 for the Psychological domain, 1.274 for Social Relationships, and 1.142 for the Environmental domain²⁵. In adults with neurofibromatosis, estimated MCID values range from 2.6 to 8.1 percentage points, depending on the domain: 3.9 to 7.3 for Physical, 4.7 to 8.1 for Psychological, 2.6 to 5.9 for Social Relationships, and 4.1 to 6.6²⁶ for Environmental. MCID estimates derived from WHOQOL-Bref applications vary widely across the literature and are not available for general populations, nor for quilombola populations. Normative regulation of bodies and behaviors within Evangelical churches

strongly influences self-care practices, often restricting behaviors that could otherwise have a positive impact on individual health²⁷.

Monthly income of two or more minimum wages was positively associated with Psychological domain scores and negatively associated with the number of household members, exposure to environmental dust, and self-reported illness. These factors are closely related to psychological well-being, particularly in settings of social vulnerability, where household crowding compromises access to adequate food, healthy living conditions, privacy, effective mediation of family conflicts, and restorative sleep.

Reporting at least one of the seven investigated morbidities was also important in explaining variation in the Physical, Psychological, and Environmental quality-of-life domains. The presence of one or more of these conditions affects multiple aspects of physical functioning and overall well-being, thereby reducing quality of life among quilombolas. A case-control study conducted with quilombolas in Espírito Santo found that the median Physical domain score was higher among individuals with hypertension (median = 57.14) than among those without hypertension (median = 60.71)²³.

Age showed a strong positive association with scores in the Social and Environmental domains, and a weak or no association with the Physical and Psychological domains. A study of 930 users of Primary Health Care Units in Belo Horizonte aged 18 years or older reported higher Environmental domain scores among individuals aged 60 years or older than among those aged 18–39 years²⁸. Among residents of Quingoma aged 60 years or older, a strong sense of belonging to the quilombo, attachment to the territory, preservation of quilombola traditions, and sustained social networks may help explain their more favorable assessments of the social and environmental dimensions of quality of life.

Scores in the Environmental domain were 6.045 units lower among individuals

reporting illness, highlighting the critical impact of the environment in both health determination and in coping with the disease burden affecting the quilombola population. Variation in the Environmental domain was also strongly influenced by monthly income of at least two minimum wages, fear of losing their home or land, and the perceived risk associated with the absence of sanitary sewage in the locality. These findings suggest that a considerable proportion of quilombolas are aware of the close interconnection between these factors and the environmental dimension of their quality of life. Thus, those with higher mean scores in the Environmental domain are likely to be individuals with better income, greater concern about land or housing loss, and a clearer perception of the health risks posed by the absence of basic sanitation in the quilombo. It is worth recalling that the Environmental domain comprises eight items addressing, among other aspects, satisfaction with financial resources, access to and availability of social and health services, transportation, features of the physical environment—such as pollution, noise, traffic, and climate—physical safety and security, and opportunities for recreation and leisure. A study involving 129 older quilombolas in Northeast Brazil found that the Environmental domain was particularly compromised following a process of forced resettlement, which disrupted traditional fishing, hunting, and extractive practices that had ensured community self-sufficiency²⁹. According to data from the Quilombola Census 2022, 347 (70.24%) of the 494 officially delimited quilombola territories still have pending land titling processes³.

Quingoma de Dentro is situated in a conflict-prone area marked by real estate speculation and the absence of formal territorial demarcation. Additionally, the presence of a Pruning and Construction Debris Center within the quilombo, surrounded by irregular housing, contributes to the area's environmental vulnerability. In this community, 83% of

study participants reported using rudimentary pits to dispose of household solid and liquid waste. This practice leads to soil and water contamination due to inadequate sealing. For a substantial number of residents, an outdoor latrine represents the only means of waste disposal, further illustrating the environmental and sanitary vulnerability experienced by this quilombo. Consistent with these findings, the Quilombola Census 2023 indicates that 9.75% of the quilombola population have only a toilet or pit for excreta disposal, including those located within household plots. Overall, 90% of quilombola residents live with some form of basic sanitation inadequacy, whether related to water supply, sewage disposal, or solid waste collection³. A large-scale study involving 927 quilombolas from Vitória da Conquista, Bahia, showed that their demographic profile was comparable to that of the Brazilian population in terms of age and sex; however, sanitation access was more limited and socioeconomic conditions were less favorable in the quilombo context²³.

Quality of life is a self-reported construct and therefore requires appropriate measurement strategies. To address this challenge, the WHOQOL-Bref was employed, a widely used instrument recognized for its ease of application and high reliability. Given the limited body of scientific research on quality of life among quilombola populations, this study advances understanding of the factors shaping their lived conditions. It also explores dimensions that have received little attention in previous research, including formal and informal employment, religious affiliation, monthly income, number of household members, fear of losing land or housing, and multiple environmental risks. Nonetheless, some limitations should be acknowledged. Although small, participant losses of an indeterminate magnitude prevented complete census coverage. Furthermore, the lack of prior information on the size of the population in the Quingoma quilombo precluded a precise estimate of the local population.

Conclusions

The findings indicate that the four quality-of-life domains assessed among members of the Quingoma de Dentro quilombola community showed strong associations with several factors examined in this study. The Physical domain was linked to both formal and informal employment, evangelical religious affiliation, and self-reported illness. The Psychological domain was associated with monthly income, number of household members, exposure to dust, and being ill. The Social domain was related to age and formal employment, while the Environmental domain showed associations with age, monthly income, lack of sanitary sewage, number of household members, exposure to dust, fear of losing land or housing, and self-reported illness. Comparison of these findings with those of other studies was limited by the scarcity of research assessing quality of life in quilombola communities using the WHOQOL-Bref.

Quality of life among quilombola populations remains an underexplored field and requires greater engagement and dissemination within the scientific community. The limited number of studies focusing on quilombola populations has constrained broader analyses of the challenges and living conditions experienced by these communities. Expanding research involving this population is essential to strengthening social recognition and promoting the valorization of quilombola communities. In the territory of Quingoma de Dentro, multiple social processes unfold that profoundly affect residents' quality of life and health.

Among the longstanding injustices rooted in the period of slavery, the denial of land rights stands out. Although officially certified by the Fundação Cultural Palmares, the Quingoma quilombo continues to resist territorial invasion and dispossession driven by urban expansion projects framed as development initiatives, which generate social conflict and environmental change. The definitive titling

of quilombola lands ultimately constitutes a Health Surveillance action within the conceptual framework that guides Brazilian collective health. The case of Quingoma underscores the need to advance debate on the close and inseparable relationship between health and quality of life³⁰.

Authorship contributions

Cavalcanti CM (0009-0007-1409-3008)* contributed to the conception and design of the study; data collection, analysis, and

interpretation; drafting of the manuscript and its critical revision; and approved the final version. Lins-Kusterer L (0000-0003-3736-0002)* contributed to the conception and design of the study; data analysis and interpretation; initial drafting of the manuscript and its critical revision; and approved the final version. Carvalho FM (0000-0002-0969-0170)* contributed to the conception and design of the study; data collection, analysis, and interpretation; initial drafting of the manuscript and its critical revision; and approved the final version. ■

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