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ORIGINAL ARTICLE

Prevalence and biopsychosocial factors associated with chronic low back pain in urban and rural communities in Western Africa: a population-based door-to-door survey in Benin

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Abstract

Purpose This study aimed to assess the prevalence of chronic low back pain (CLBP) and related biopsychosocial factors in urban and rural communities in Benin.

Methods This is a population-based observational cross-sectional survey. An interviewer-administered electronic questionnaire was used to collect information on demographic, socio-economic, behavioral, and psychological factors relating to CLBP risk factors and medical history of participants. The numeric pain rating scale and the Beck Depression Inventory were used to assess pain intensity and the level of depression, respectively. Bivariate analyses were performed to investigate the association between sociodemographic, behavioral, and psychological factors and CLBP. Sequential multiple regression analyses were subsequently performed to predict the occurrence of CLBP.

Results A total of 4320 participants, with a mean age ± SD of 32.9 ± 13.1 years, of which 40.7% were females and 50.1% from an urban area, were enrolled in the study. We found a global prevalence rate of CLBP of 35.5% [95% CI 34.1–36.9%]. The prevalence in urban areas was 30.68% [95% CI 28.9–32.8%]) while 40.2% was found in rural areas [95% CI 38.1–42.2%]). Age ($p < 0.001$), level of education ($p = 0.046$), marital status ($p < 0.001$), working status ($p < 0.003$), tobacco use ($p < 0.016$) and regular physical activity ($p < 0.011$) were associated with CLBP. In urban areas, only the level of education was able to predict the prevalence of CLBP ($R^2 = 61\%$). In rural areas, CLBP was predicted by age, marital and working status ($R^2 = 89\%$).

Conclusions This study showed a high prevalence of CLBP among urban and rural communities in Benin. Age, level of education, marital status, and working status were significantly associated with CLBP in Benin.

Keywords Chronic low back pain · Prevalence · Biopsychosocial factors

Introduction

Chronic low back pain (CLBP) is defined as "low back pain lasting for more than three months, or as episodic low back pain within 6 months" [1]. CLBP is known as one of the most common and disabling chronic pain conditions, affecting up to 19.6% of individuals aged 20 to 59 years in high-income countries [2]. CLBP is among the most prevalent causes of work absence and healthcare consumption worldwide [3]. Despite these facts, CLBP has rarely been a focus of public health programs, especially in low- and middle-income countries [4]. This was recently confirmed by a call for action initiative [5]. As a result, the socio-economic problem of CLBP is currently underestimated and has even been ignored for a long time, mainly due to its low mortality rate and because of considered often as being irreversible or simply part of the ageing process.

To date, very few population-based studies investigated the prevalence of CLBP and its associated factors in Africa [6–8]. Twenty years ago, Omokhodion assessed the prevalence of low back pain in a rural community in South West

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Nigeria and found a 44% prevalence rate of low back pain [9]. Risk factors were male gender and farming as an occupation. More recently, Igwesi-Chidobe et al. [7], investigated which biopsychosocial factors associate with CLBP disability in rural Enugu State, South-eastern Nigeria. These authors did not report the prevalence rate of CLBP but found that illness perceptions, pain intensity, catastrophizing, fear-avoidance beliefs, lack of social support, and female gender were significant predictors of self-reported and performance-based disability amongst people with CLBP in these areas.

Overall, an issue that has become important in the modern healthcare system is the rural health. Rural and urban social environments differ so much that studies should not generalize findings across these populations [10, 11]. Specifically, some previous research indicated that rural populations are unique in culture, economics, lifestyle, values, population mix, social organization, and behaviors relating to illness and healthcare [10, 12]. A study in India determined that more people with a rural background reported severe chronic pain than those with an urban background [13]. The authors explained these findings by the lack of social support as well as living or working in socially isolated environments.

To the best of our knowledge, no studies have been carried out in West African countries investigating CLBP prevalence in rural compared to urban areas. Therefore, this study aimed to assess the prevalence of CLBP in Benin, and subsequently investigate the associated biopsychosocial factors in urban and rural communities.

Methods

Study design and setting

This is a population-based cross-sectional survey conducted from April to June 2021 in six cities in the Republic of Benin: three urban cities (Cotonou, Abomey-Calavi, and Parakou) and three rural cities (Ketou, Dassa-Zoumè, and Pèrèrè). Rural cities are characterized as small cities composed of mainly rural areas with suburbs and villages, as opposed to large cities with a mainly urban character. Figure 1 shows the selected cities on a map of the Republic of Benin.

Ethics considerations

This study received approval from the biomedical ethics committee of the University of Parakou (certificate number: 0429/CLERB-UP/P/SP/R/SA). Informed consent and agreement to participate in the study were obtained via signature or thumbprint.

Study size

A minimal sample size of 689 participants per city was estimated according to the Schwartz formula, $N=(Z\alpha 2^{*}p^{*}q)/i2$, where N = minimal sample size, $p=25.80\%$ (prevalence) [14]; $q=(1\text{-p})$, $Z\alpha=1{,}96$ (for $\alpha=5\%$), and $i=4\%$ (accuracy). A margin of 10% was applied to cover potential refusals to participate.

Participants

Figure 2 describes the selection flow chart of the participants. The identification and recruitment of the participants were conducted using a three-stage sampling technique. The National Institute of Statistics and Economic Analysis (INSAE) provided the initial frame based on data from the last general census (2013) of population and housing (RGPH4) in Benin. The first stage consisted of a simple random sampling technique to select six cities: one rural city and one urban city in the north (Departments of Borgou and Alibori), two rural cities in the center (Departments of Collines and Plateaux), and two urban cities in the south (Departments of Atlantique and Littoral). The second stage comprised a selection of 50% of neighborhoods in the selected cities through a simple random sampling approach. The number of households to be surveyed in each neighborhood was obtained by dividing the sample size by the number of neighborhoods. Participating households were identified by a systematic sampling approach. The first household to be surveyed in each neighborhood was randomly identified from the middle of the neighborhood by throwing a pen and by subsequently following the direction of the pen direction. The third and last stage consisted of a random selection of one individual per household according to the Kish method as recommended by the WHO [15].

Inclusion criteria

To be included in the study, participants had to meet the following criteria: aged ≥ 18 years, resident of the city for ≥ 6 months, and absence of any major cognitive impairments that could interfere with the survey response.

Exclusion criteria

Exclusion criteria were pregnancy, history of spinal surgery, and red flags indicative of serious spinal pathologies like cancer, traumas, or infection.

Variables and measurement

Sociodemographic information, as well as behavioral data, was collected using a general questionnaire. Participants'

Fig. 1 A map of the Republic of Benin, showing the cities selected for the study

body height was obtained from their ID card information while their body weight was obtained using a mechanical scale, type SECA. Those with 18.5 ≤ Body Mass Index (BMI) ≤ 25 were classified as having a normal body weight while those with BMI > 25 were classified as being overweight or those with BMI > 30 as obese [16]. Those who smoked occasionally as well as those who smoked regularly were all considered as being tobacco users. We also recorded peoples' self perspectives on being regularly physically active or not. Those who were physically active were consecutively questioned about the weekly frequency and duration of their physical activity.

Numeric pain rating scale (NPRS)

The Numerical Pain Rating Scale (NPRS) was used to evaluate pain severity and has been reported to have good psychometric properties and clinical applicability [17]. The scores range from 0 with 'no pain' to 10 with 'unacceptable pain'.

Presence of chronic low back pain

The presence of CLBP was defined as having pain (NPRS score > 0) between the 12th rib and the gluteal cleft, with or without radiation to the legs [18], lasting at least 12 weeks without a specific underlying pathology or occurring episodically within 6 months [18].

Beck depression inventory (BDI)

We used the BDI to assess the severity of depression [19]. The BDI is a widely used tool to discriminate between chronic pain patients with and without major depression

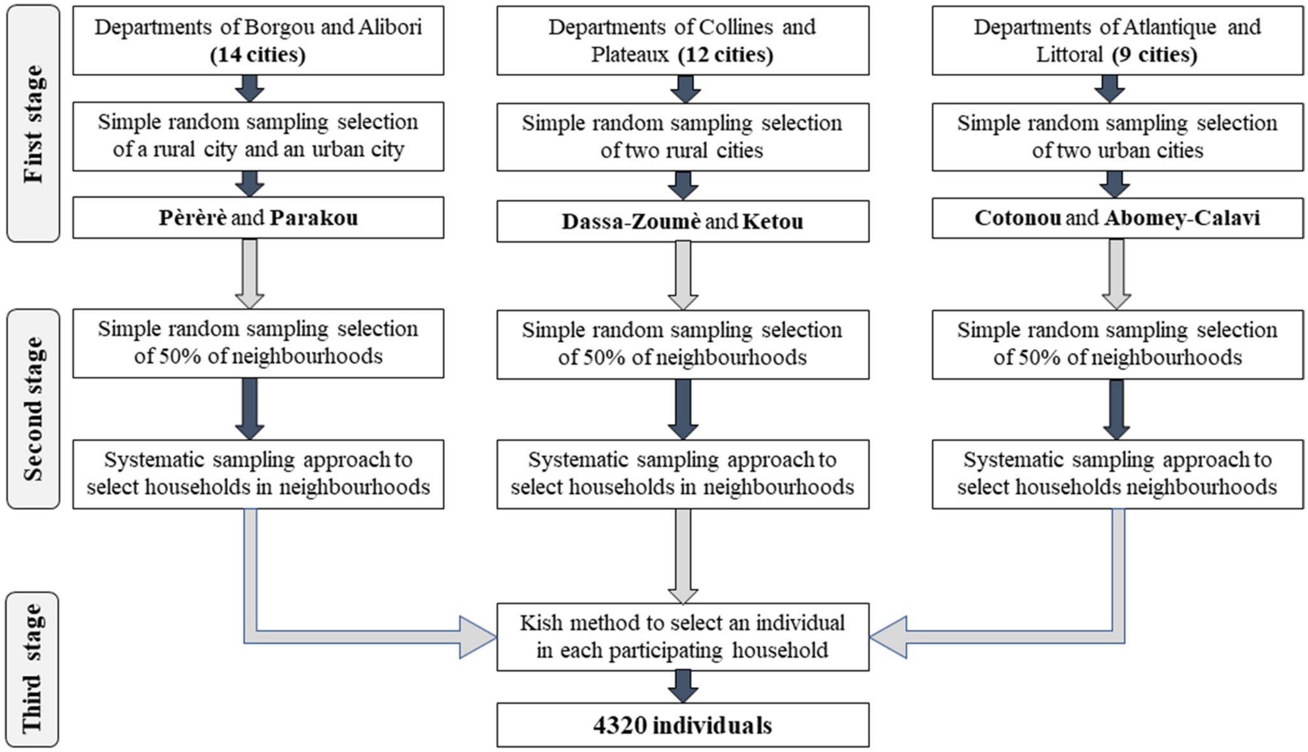

Fig. 2 Selection flow chart of participants using a three-stage sampling technique

[20]. The total score of the BDI ranges from 0 to 63 with higher scores corresponding to a higher level of depression. Specifically, a score of 0–9 corresponds to the absence of depression while 10–15 corresponds to mild depression, 16–23 to moderate depression, and 24–63 to severe depression. The reliability of the BDI is high (Cronbach's $\alpha = 0.88$) [21].

Study procedures

An interviewer-administered electronic questionnaire was used to collect information on sociodemographic, behavioral, and psychological factors relating to CLBP risk factors, and medical history including past diagnosis of CLBP. All researchers involved in data collection were briefed extensively on the study methodology and underwent rigorous training to ensure consistency and compliance with the study procedures.

Statistical analyses

Data were analyzed using Epi Info 7.2.2.6 software. Data were assessed for normality using the graphical method of Q–Q plot. Nominal and ordinal variables were presented as proportions while quantitative variables with normal distribution were presented as means with standard deviation (SD). Bivariate analyses with Fisher's exact tests were used to investigate associations between sociodemographic, behavioral, psychological data, and geographical areas while the associations with CLBP were analyzed through the odds ratio (OR) with a 95% confidence interval. Confidence intervals could not overlap nor include 0, and in case they did, the difference was deemed not to be significant. Variables with a significant association with CLBP were entered into a sequential multiple logistic regression analysis to determine factors predicting CLBP. An adjusted coefficient of determination (R^2), which considers the number of selected variables, was used to avoid overestimating the predictive variance of the regression equation. Interactions between variables were examined by testing the significance of the model and individual variables without each interaction and after adding it. The association of each variable with CLBP was tested for inclusion in the model using a significance level that was higher than the one set to define a cofactor [22]. This is usually set at $p < 0.2$ for bivariate analysis and then set at $p < 0.05$ for retaining a factor in the final model [22].

Results

Sociodemographic characteristics

Table 1 describes the sociodemographic characteristics of the sample. Of the 4320 respondents, 50.09% were enrolled in an urban area, and 40.67% were females. The mean ± SD age of respondents was 32.85 ± 13.08 years. Most of the participants were living together as a couple (62.22%) and more than three quarters were independent workers (56.64%) or were unemployed (26.44%). All the examined sociodemographic characteristics were significantly different between urban and rural cities. Specifically, in urban cities, there were significantly more young people ($p = 0.001$), more males ($p = 0.001$), more people with a high education level ($p < 10^{-6}$), fewer self-employed people ($p < 10^{-4}$), and more paid workers ($p < 10^{-4}$) compared to rural areas.

Behavioral and psychological factors

Table 2 presents the distribution of the behavioral and psychological factors in the sample. All the examined behavioral and psychological factors were significantly different between urban and rural cities, except for tobacco use ($p = 0.368$). Specifically, significantly more people in urban areas declared that they practice regular physical activity compared to rural areas ($p < 10^{-6}$). However, in urban areas, most of the people practice 1–2 times a week whilst those in rural areas practice at least 3 times per week ($p < 10^{-6}$). Overall the time spent on physical activity was balanced between the two areas. Regarding BMI and depression, there were more overweight or obese people ($p < 10^{-3}$), and more people with depression ($p < 10^{-6}$) in urban compared to rural cities. Specifically, the mean ± SD BMI of the sample was 22.75 ± 3.94 kg m^{-2}. A total of 567 people, 13.13% [95% CI 12.15–14.16%] were overweight while 245 people, 5.67% [95% CI 5.02–6.40%] were obese. There were significantly more overweight people in urban areas compared to rural areas (14.56% [95% CI 13.13–16.11%] versus 11.69% [95% CI 10.40–13.11%] respectively, $p = 0.022$). The prevalence of people with obesity was similar in both areas (p = 0.74).

Overall and area-specific prevalence of CLBP

Table 3 shows the global prevalence and the region-specific prevalence of CLBP in this study. We found a global prevalence rate of 35.49% [95% CI 34.07–36.93%] of CLBP. This prevalence varied between cities. Overall, rural areas showed a significantly higher prevalence rate (40.17% [95% CI 38.12–42.25%]) compared to urban areas (30.68% [95% CI: 28.91–32.80%]) ($p < 10^{-6}$).

Table 1 Participants' sociodemographic characteristics

$N = 4320$	Urban, *n*(%)	Rural, *n*(%)	Total	*P*-value
Age (year)				
18–29	1146 (52.96)	1054 (48.89)	2200	0.001
30–44	656 (30.31)	683 (31.68)	1339	
45–59	273 (12.62)	293 (13.68)	566	
60 +	89 (4.11)	124 (5.75)	213	
Gender				
Male	1337 (61.78)	1226 (56.86)	2563	0.001
Female	827 (38.22)	930 (43.14)	1757	
Education				
No formal education	308 (14.23)	813 (37.71)	1121	$< 10^{-6}$
Primary	581 (26.85)	600 (27.83)	1181	
Secondary	810 (37.43)	558 (25.88)	1368	
Higher	465 (21.49)	185 (8.58)	650	
Marital status				
Live alone	976 (45.10)	656 (30.43)	1632	$< 10^{-6}$
As a couple	1188 (54.90)	1500 (69.57)	2688	
Religion				
Christian	1471 (67.98)	1259 (58.40)	2730	< 0.001
Muslim	569 (26.29)	773 (35.85)	1342	
Other	124 (5.73)	124 (5.75)	248	
Work status				
Self-employed (own business or farming)	1147 (53.01)	1300 (60.29)	2447	$< 10^{-4}$
Paid work	126 (5.82)	67 (3.11)	193	
Unemployed, Student	636 (29.39)	506 (23.47)	1142	
Other (Retired, non-paid work, etc.)	255 (11.78)	283 (13.13)	538	

Table 2 Behavioural and psychological factors in the sample

	Urban, *n*(%)	Rural, *n*(%)	Total	*P*-value
Tobacco use				
No	2010 (92.88)	1986 (92.12)	3996	0.368
Yes	154 (7.12)	170 (7.88)	324	
Regular physical activity				
No	1111 (51.34)	1347 (62.48)	2458	$<10^{-6}$
Yes	1053 (48.66)	809 (37.52)	1862	
Frequency of physical activity/week (times/week)				
1–2	773 (73.41)	474 (58.59)	1247	$<10^{-6}$
≥ 3	280 (26.59)	335 (41.41)	615	
Duration of physical activity/week (minutes/week)				
< 150	77 (7.31)	40 (4.94)	117	0.046
≥ 150	976 (92.69)	769 (95.06)	1745	
Body mass index				
18.8–25	1699 (78.51)	1807 (83.81)	3506	$<10^{-3}$
> 25	463 (21.49)	349 (16.19)	812	
Depression				
Absent	1988 (91.87)	2070 (96.01)	4058	$<10^{-6}$
Present	176 (8.13)	86 (3.99)	262	

The association between sociodemographic factors and CLBP

Table 4 shows the results of the association between sociodemographic factors and CLBP in urban and rural areas. In urban areas, education level and work status were significantly associated with CLBP. More specifically, bivariate analyses showed that a higher education level was associated with a lower likelihood of having CLBP. Also, unemployed people and students had 1.77 higher odds of having CLBP compared to self-employed people. Furthermore, in rural areas, age, marital status, and working status were associated with CLBP. Also, those who were living together as a couple had 1.48 higher odds of CLBP compared to those who were living alone. In addition, retirees and those who have unpaid work showed 1.53 higher odds compared to self-employed people.

The association between behavioral/psychological factors and CLBP

Table 5 presents the results of the association between behavioral and psychological factors on the one hand and CLBP on the other hand, in urban and rural areas. No association was found.

Factors predicting CLBP

Table 6 presents the final model predicting CLBP in both urban and rural areas. In urban areas, only education level was predictive with a lower education level being a predicting factor for having CLBP. This model explains about 61% of the total variance of the odds of having CLBP in urban areas. On the other hand, in rural areas, CLBP was predicted by age, marital status, and working state. This model explains about 89% of the total observed variance of the odds of having CLBP in rural areas.

Discussion

This study aimed to assess the prevalence of CLPB in Benin and subsequently investigate the associated biopsychosocial factors in urban and rural communities in Benin. Overall, the results showed high prevalence rates of CLBP up to 35%. Several factors were associated with having CLBP such as age, level of education, marital status, working status, tobacco use, and regular physical activity. However, in urban areas, only the level of education significantly predicted CLBP while in rural areas age, marital status, and working status were the significant predictors.

Table 3 Overall and city specific CLBP prevalence rates

Area	City	Population (2013)	Study sample	Prevalence of CLBP		Urban versus rural		
				Cases	% [CI 95%]	OR	CI 95%	*p*-value
Urban	Cotonou	679 012	722	219	30.33 [27.09–33.78]			
	Abomey-Calavi	656 358	722	202	27.98 [24.83–31.36]			
	Parakou	255 478	720	246	34.17 [30.79–37.71]			
	Total urban		2164	667	30.68 [28.91–32.80]	1.51	1.33–1.71	$<10^{-6}$
Rural	Ketou	157 352	721	331	45.91 [42.30–49.56]			
	Dassa-Zoumè	112 122	720	253	35.14 [31.74–38.70]			
	Pèrèrè	78 988	715	282	39.44 [35.92–43.07]			
	Total rural		2156	866	40.17 [38.12–42.25]			
Overall		1 939 310	4320	1533	35.49 [34.07–36.93]			

OR odds ratio; CI Confidence interval

Table 4 Association between sociodemographic factors and CLBP

N = 4320	Urban, n(%)					*P*-value	Rural, n(%)					*P*-value
	N	*n*	%	OR	CI 95%		*N*	*n*	%	OR	CI 95%	
Age (year)												
18–29	1146	355	30.98	1	–	–	1054	367	34.82	1	–	–
30–44	656	213	24.51	1.05	0.86–1.27	0.636	683	303	44.36	1.27	1.06–1.53	**0.008***
45–59	273	67	32.47	0.79	0.59–1.06	0.118	293	138	47.10	1.35	1.07–1.71	**0.011***
60 +	89	32	35.96	1.16	0.76–1.77	0.488	124	58	46.77	1.34	0.96–1.88	0.082
Gender												
Male	1337	411	30.74	1	–	–	1226	512	41.76	1	–	–
Female	827	256	30.96	1.01	0.84–1.22	0.916	930	354	38.06	0.86	0.72–1.02	0.083
Education												
No formal education	308	92	29.87	1	–	–	813	328	40.34	1	-	-
Primary	581	179	30.81	1.05	0.77–1.41	0.772	600	254	42.33	1.09	0.88–1.34	0.453
Secondary	810	251	30.99	1.05	0.79–0.40	0.717	558	216	30.71	0.93	0.75–1.16	0.543
Higher	465	145	31.19	0.73	0.54–0.99	**0.046***	185	68	36.76	0.86	0.62–1.20	0.368
Living style												
Live alone	976	303	31.05	1	–	–	656	221	33.69	1	–	–
As a couple	1188	364	30.64	0.98	0.82–1.18	0.839	1500	645	43.00	1.48	1.23–1.80	**< 0.001***
Religion												
Christian	1471	448	30.46	1	–	–	1259	494	39.24	–	–	–
Muslim	569	191	33.57	1.15	0.94–1.42	0.174	773	315	40.75	1.07	0.89–1.28	0.499
Other	124	28	22.58	0.67	0.43–1.03	0.066	124	57	45.97	1.32	0.91–1.91	0.144
Work status												
Self-employed	1147	360	31.39	1	–	–	1300	502	38.62	1	–	–
Paid work	126	46	36.51	0.86	0.47–1.56	0.614	67	24	35.82	0.89	0.53–1.48	0.647
Unemployed, students	636	187	29.40	1.77	1.21–2.60	**< 0.003***	506	201	39.72	1.05	0.85–1.29	0.66
Other (Retired, non-paid work)	255	74	29.02	0.90	0.67–1.90	0.448	283	139	49.12	1.53	1.19–1.99	**0.001***

*N, sample size; n, number of CLBP; * statistically significant*

The prevalence rate of CLBP found in Benin is far higher than that reported by several population-based studies in developed countries such as the USA (8.1%) [23], Spain (11.12%) [24], and Canada (15.7–23.3%)[25]. This is in line with a previous review[26] which estimated the point prevalence of low back pain among Africans at 39% which is considerably higher than the global low back pain prevalence estimate (18.3%) reported by Hoy et al. [27]. Overall, estimates from the global burden of disease study in 2017 found that globally low back pain continued to be the leading cause of years lived with disability [28]. Nevertheless, countries and health-related organizations continue to prioritize communicable diseases over non-communicable diseases such as low back pain. This is especially true in the current COVID-19 pandemic context. In 2018, The Lancet Low Back Pain Series made a call for action on the management of low back pain burden from governments, policymakers, and the broader society [29]. Authors suggested establishing integrated and collaborative approaches built upon affordable solutions to the growing burden of low back pain in low- and middle-income countries such as Benin [30, 31]. This is especially relevant given that many of the risk factors for CLBP are shared by other non-communicable chronic diseases.

The findings of this study showed that people aged above 60 had two times more odds of having CLBP compared to 18-29-year-old people, specifically in rural areas. Earlier research confirms that the incidence and prevalence of CLBP increase with older age [32, 33]. Various age-related physical and psychological changes (e.g., degenerative changes, physical inactivity, slower reaction time, and changes in central pain processing), as well as multiple risk factors (e.g., genetic, gender, and ethnicity), may affect the incidence, prognosis and management of CLBP in older adults [34]. In the context of this study, specifically in rural areas, agriculture is the predominant socio-economic occupation. Unfortunately, most of the farmers still practice agriculture with rudimentary means due to their low accessibility to mechanization. It is well established that physical and psychosocial work stressors relate to employees' work-related musculoskeletal symptoms [35]. Then, the accumulation of physically-demanding working hours over the years in

Table 5 Association between Behavioural and psychological factors and CLBP

N = 4320	Urban, *n*(%)						Rural, *n*(%)					*P*-value
	N	*n*	%	OR	CI 95%	*P*-value	*N*	*n*	%	OR	CI 95%	
Tobacco use												
No	2010	629	31.29	1			1986	783	39.43	1		
Yes	154	39	25.32	0.81	0.56–1.16	0.251	170	83	48.82	1.24	0.94–163	0.127
Regular physical activity												
No	1111	341	30.69	1			1347	513	38.08	1		
Yes	1053	326	30.96	1.01	0.85–1.20	0.922	809	353	43.63	1.15	0.98–1.35	0.098
Frequency of physical activity/week (times/week)												
1–2	773	242	31.31	–	–	–	474	199	41.98	1	-	-
≥ 3	280	84	30.00	0.94	0.70–1.27	0.685	335	154	45.97	1.18	0.89–1.56	0.260
Duration of physical activity/week (min/week)												
< 150	77	18	23.38	1	-	-	40	20	50.00	1	–	–
≥ 150	976	308	31.56	1.51	0.88–2.61	0.135	769	333	43.30	0.76	0.40–1.44	0.405
Corpulence (body mass index)												
Normal weight	1699	522	30.72				1807	715	39.57	1	–	–
Overweight and obesity	465	145	31.18	1.02	0.82–1.28	0.850	349	151	43.27	1.16	0.92–1.47	0.197
Depression												
Present	176	57	32.37	1	–	–	86	33	38.37	–	–	–
Absent	1988	610	30.68	0.92	0.66–1.29	0.64	2070	833	42.24	1.08	0.69–1.69	0.729

N, sample size; n, number of CLBP

Table 6 Sequential multiple logistic regression analysis for chronic low back pain

Area	Variables	OR	CI 95%	Coefficient	*p*-value	R^2 adjusted
Urban	Education					0.61
	Primary / No formal education	0.80	0.59–1.08	− 0.23	0.138	
	Secondary / No formal education	0.73	0.56–0.94	− 0.32	**0.016***	
	Higher / No formal education	0.71	0.53–0.95	− 0.34	**0.023***	
Rural	Age (years)					0.89
	30–44/18–29	1.34	1.04–1.71	0.29	**0.023***	
	45–59/18–29	1.42	1.71–2.85	0.35	**0.024***	
	60 + /18–29	1.61	1.10–2.34	0.47	**0.014***	
Marital status						
	As a couple/Live alone	1.24	1.59–1.96	− 0.28	**0.025***	
Work status						
	Paid work/Self-employed	0.83	0.49–1.38	0.39	0.465	
	Unemployed, students/Self-employed	1.28	1.02–1.61	− 0.19	**0.035***	
	Other (Retired, non-paid work)/Self-employed	1.48	1.14–1.91	− 0.25	**0.004***	

*Statistically significant

conjunction with other risk factors would explain the high exposure to CLBP of older adults compared to young. As a consequence, it is reasonable that work status is associated with CLBP in both rural and urban areas and that it is among the predictors of CLBP in rural areas. Moreover, biophysical factors including working conditions and psychosocial factors including back pain beliefs may also contribute to the significant discrepancy found in the prevalence of CLBP concerning geographic residence. Negative beliefs about back pain are described as a signal of an impending threat, which may lead to fear of movement, decreased function and activity, and consequently persistent chronic disability [36].

In accordance with the above, the results of the present study showed that education level is significantly lower in rural compared to urban areas with about one-third of people in rural areas having no formal education. In addition, this study revealed that people with higher education levels presented lower odds of developing CLBP compared with illiterates and this factor was the only one that significantly explained the occurrence of CLBP in people living in urban areas. These findings are consistent with those of prior studies identifying lower education level as being associated with an increased risk of low back pain and associated disability [37]. A recent study from KwaZulu-Natal (South Africa) also found that people with no formal education had about 6 times more risk of having CLBP [38]. This association could reflect variations in behavioral and environmental risk factors as well as variations in living and work conditions. People with higher education levels are more likely to be in professional, managerial, or other skilled occupations that are generally less physically demanding and where there is more flexibility to eliminate pain-provoking job situations [39]. In addition, people with higher education levels are more likely to have adequate access to health services and to develop adaptive stress coping strategies [40].

Study strength and limitnsations

The findings of this study involving a representative sample of 4320 participants are a valuable contribution to the evidence on CLBP and its associated factors in Benin. Our results are consistent with models corrected for potential selection bias meaning that our findings may be generalized to the population. In addition, the multiple logistic regression model used to test for associations and predict the occurrence of CLBP is appropriate and easy to interpret for a large audience. It not only provides a measure of how appropriate a predictor (coefficient size) is but also its direction of association (positive or negative).

Limitations of our study include recall bias that may have affected the declarative reports of participants about their CLBP. This includes the estimation of the duration of pain. Therefore, chances of under- or over-estimating the complaint cannot be overcome with certainty, but we expect this influence to be minimal. Another limitation of this study is that it did not include the burden or consequences of CLBP such as days of sick leave, visits to physicians or physiotherapists, length of hospitalization, functional limitations, and quality of life. This information is crucial to establishing a more comprehensive view of whether or not CLBP is a major health problem in Benin.

Conclusion

This study showed a high prevalence of CLBP among urban and rural communities in Benin. Age, level of education, marital status, and working status were significantly associated with CLBP. We suggest that future studies should examine the burden of CLBP in Benin. We also suggest that the health authorities pay more attention to primary prevention and effective management of CLBP by addressing the modifiable risk factors.

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Declarations

Conflict of interest The authors declare no potential conflicts of interest concerning the research, authorship, and publication of this article.

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