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Unspecified pain, chronic pain, and high-impact chronic pain in Lesotho: a population-based cross-sectional study

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Abstract

Objectives: Pain is understudied in Africa, and there are no data on high-impact chronic pain from this region. In this study, we assessed the prevalence of unspecified pain, chronic pain, and high-impact chronic pain, and their determinants in Lesotho, Southern Africa.

Method: We conducted a household-based, cross-sectional survey among adults aged 18 years or older in 120 randomly sampled villages across Butha-Buthe and Mokhotlong districts in Lesotho.

Results: Among the 6039 adults included, the median age was 39 years (interquartile range: 27–58), and 3153 of 6039 participants (52.2%) were female. Overall, 1194 participants (19.8%) had unspecified pain (95% confidence interval [CI]: 18.8–20.8), 909 (15.1%) had chronic pain (95% CI: 14.2–16.0), and 428 (7.1%) had high-impact chronic pain (95% CI: 6.5–7.8) corresponding to 47.1% among the participants with chronic pain. Higher age groups were associated with increasing odds of unspecified pain, chronic pain, and high-impact chronic pain. Male participants were less likely to have unspecified pain (adjusted odds ratio [aOR], 0.65; 95% CI: 0.55–0.76; $P < 0.001$) and chronic pain (aOR, 0.79; 95% CI: 0.65–0.96; $P = 0.019$). There was no association between sex and high-impact chronic pain. Furthermore, high-impact chronic pain was associated with arterial hypertension, diabetes mellitus, moderate-to-high risk of depression, moderate-to-high risk of generalized anxiety disorder, and household wealth.

Conclusion: The prevalence of chronic pain and high-impact chronic pain was elevated in our study population. Associations with further noncommunicable chronic conditions, such as arterial hypertension and diabetes mellitus, support the need for health systems to provide integrated chronic care which includes pain management.

Keywords: Chronic pain, High-impact chronic pain, Lesotho

1. Background

Pain and its associated disorders are among the most frequent causes of disability globally.[8,36] A recent analysis of unspecified pain among adults using data across 52 countries estimated the prevalence of pain to be 27.5% on average, ranging from 9.9% to 50.3% between countries.[49] The burden of pain is reportedly greater in low-income and middle-income countries due to manual labor, accidents, violence, and low availability of potent

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analgesics and is expected to grow as life-expectancy increases.[8,36] Chronic pain, defined as the presence of pain that lasts or recurs for more than 3 months,[44] affects 20% of individuals worldwide,[3,10] with 1 in 10 adults newly affected every year.[21] It exerts substantial pressures on health systems[21,33,35,41] and is the leading cause of years lived with disability,[27,47] resulting in an annual loss of 149 million workdays.[24,34] Chronic pain has been linked to restrictions in daily activities, dependence on opioids, anxiety and depression, and overall poor quality of life.[3,14,25,31,42,44]

High-impact chronic pain is defined as the presence of chronic pain, accompanied with restrictions in activity and/or participation in daily life.[16,37] Estimates of high-impact chronic pain distinguish individuals with limitations in such domains as work, social, recreation, and self-care activities from individuals who continue to lead a normal life despite chronic pain.[14]

Although the burden of pain-related disorders is estimated to be higher in low-income and middle-income countries,[17,36] reliable prevalence data from these countries are extremely limited.[28] In Lesotho, Southern Africa, there are limited data on chronic pain, and no data on high-impact chronic pain to inform the design, implementation, and scale-up of relevant population-wide interventions.[24,27] In this study, we present the prevalence of unspecified pain, chronic pain, and high-impact chronic pain, and their determinants in a population-based survey in 2 districts in Lesotho.

2. Method

2.1. Design, setting, and participants selection

This cross-sectional study was conducted during a large household-based survey to assess the prevalence and determinants of several chronic conditions in 2 districts in Northern Lesotho.[22] The 2 districts have an estimated population of about 220,000 people in an area of over 6,000 km^2. The major occupations are subsistence farming, mining, and construction.[2] This study follows the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guidelines.[45]

A detailed description of the survey has been published elsewhere.[22] To summarize, we used 2-stage cluster sampling where population clusters were primary sampling units and household members secondary sampling units. From a list containing 785 clusters with at least 30 households each, 120 clusters were randomly selected (60 in each district), stratified by settlement type (urban vs rural), and accessibility with respect to the closest health facility (hard-to-reach vs easy-to-reach areas). All households in a sampled cluster were eligible if consent was provided by the head of household, who was identified by asking on first interaction with the household. Household members aged 18 years or older were randomly selected by an algorithm based on age, sex, and settlement (rural vs urban), programmed in the Open Data Kit data collection tool.[23] The sampled individuals were then approached to be included in the study.

2.2. Procedure and measurements

The study was conducted from November 2, 2021, to August 31, 2022. Study staff interviewed consenting household members using a detailed questionnaire, collecting sociodemographic and medical history data. Variables included age, sex, settlement (rural or urban), district (Butha-Buthe or Mokhotlong), educational level, marital status, and employment status. In addition, we collected lifestyle variables such as level of physical activity, smoking, and alcohol consumption in the 3 months before survey, as well as daily consumption of fruits and vegetables. Furthermore, Patient Health Questionnaire (PHQ-9)[29] and General Anxiety Disorder-7 questionnaire (GAD-7)[43] were used to screen for risk of depression and generalized anxiety disorder, respectively. We used the Demographic and Health Survey program questionnaire for Lesotho to assess household wealth. This wealth index questionnaire assesses housing construction characteristics, household assets and utility services, as well as country-specific assets. Using principal component analysis, the questionnaire responses are analyzed to indicate the household's economic status in Lesotho, which is subsequently categorized into 5 quintiles ranging from poorest to wealthiest.[22,39]

2.3. Assessment of unspecified pain, chronic pain, and high-impact chronic pain

Unspecified pain and chronic pain were assessed using a semi-structured questionnaire.[28] Participants were asked the following: (1) Are you currently affected by pain either all the time or on and off? (Yes/No); (2) Have you had this pain for more than 3 months? (Yes/No); and (3) Where do you feel this pain? (options included back pain; neck and shoulder pain; chest pain; headache, facial, or dental pain; stomachache or abdominal pain; pain in the limbs; and other). A positive response to question 1 indicated the presence of unspecified pain. Affirmative responses to both questions 1 and 2 indicated the presence of chronic pain.

To assess high-impact chronic pain, further questions were added to the pain questionnaire to determine the level of incapacity to perform routine activities on account of pain, as

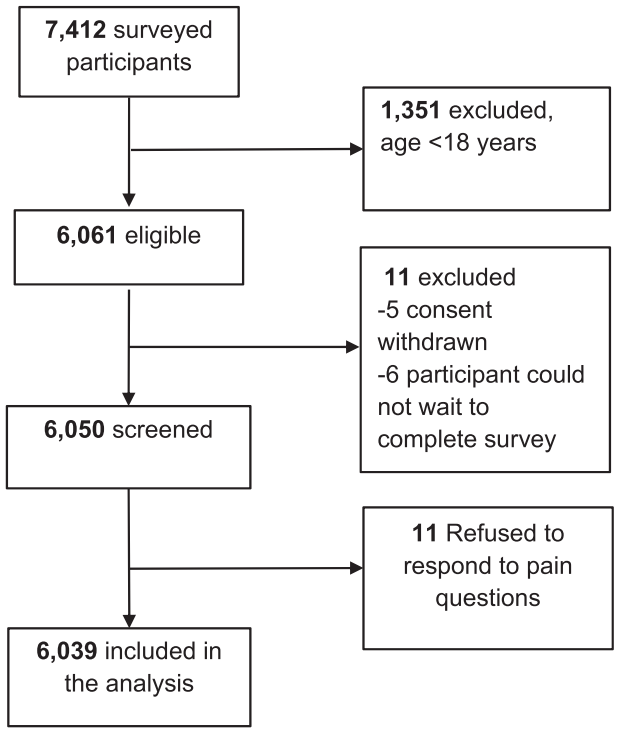

Figure 1. Study flowchart.

Table 1

Prevalence of unspecified pain, chronic pain, and high-impact chronic pain, by sociodemographic characteristics.

Variables	Enrolled N = 6039 n (%)	Unspecified pain % (95% CI)	Chronic pain % (95% CI)	High-impact chronic pain % (95% CI)
Age, y				
18–24	1162 (19.2)	6.5 (5.1–8.0)	3.9 (2.8–5.0)	1.5 (1.0–2.3)
25–34	1362 (22.6)	10.6 (9.0–12.3)	7.1 (5.8–8.5)	3.0 (2.1–3.9)
35–44	996 (16.5)	15.2 (12.9–17.4)	10.4 (8.5–12.3)	5.1 (3.8–6.5)
45–54	778 (12.9)	22.2 (19.3–25.2)	16.3 (13.7–18.9)	6.7 (4.9–8.4)
55–64	726 (12.0)	30.3 (27.0–33.6)	24.4 (21.3–27.5)	11.8 (9.5–14.2)
≥65	1015 (16.8)	42.3 (39.2–45.3)	35.4 (32.4–38.3)	17.7 (15.4–20.1)
Median age, (IQR)	39 (27–58)	58 (41–69)	60 (43–71)	61 (44–73)
Sex				
Female	3153 (52.2)	22.4 (20.9–23.8)	16.3 (15.0–17.6)	7.8 (6.9–8.8)
Male	2886 (47.8)	16.9 (15.5–18.3)	13.7 (12.5–15.0)	6.3 (5.4–7.2)
BMI, kg/m^2				
<18	533 (8.8)	20.1 (16.7–23.5)	16.9 (13.7–20.1)	8.6 (6.2–11.0)
18–24.9	3057 (50.6)	17.6 (16.3–19.0)	13.3 (12.1–14.5)	6.4 (5.6–7.3)
25–29.9	1300 (21.5)	19.8 (17.7–22.0)	15.5 (13.6–17.5)	6.5 (5.1–7.8)
≥30	1092 (18.1)	23.9 (21.4–26.4)	17.1 (14.9–19.4)	7.9 (6.3–9.5)
Missing	57 (0.9)	—	—	—
Median BMI, (IQR)	23.4 (20.5–27.9)	24.2 (21.0–29.2)	24.0 (20.8–28.9)	23.8 (20.7–29.1)
Settlement				
Rural	2888 (47.8)	20.4 (19.0–21.9)	15.3 (14.0–16.7)	7.4 (6.5–8.4)
Urban	3151 (52.2)	19.2 (17.8–20.5)	14.8 (13.5–16.0)	6.8 (5.9–7.6)
District				
Butha buthe	3162 (52.4)	14.3 (13.0–15.5)	9.8 (8.8–10.8)	5.7 (4.9–6.5)
Mokhotlong	2877 (47.6)	25.8 (24.2–27.4)	20.8 (19.3–22.3)	8.6 (7.6–9.6)
Education				
None	607 (10.1)	30.6 (27.0–34.3)	25.5 (22.1–29.0)	13.2 (10.5–15.9)
Primary	2817 (46.6)	23.4 (21.8–24.9)	18.1 (16.6–19.5)	8.7 (7.7–9.7)
Secondary	2172 (36.0)	12.6 (11.2–14.0)	8.7 (7.5–9.8)	3.8 (3.0–4.6)
Tertiary	442 (7.3)	17.2 (13.7–20.7)	12.7 (9.6–15.8)	4.5 (2.6–6.5)
Refused to say	1 (0.02)	—	—	—
Marital status				
Single	1325 (21.9)	8.6 (7.1–10.1)	6.5 (5.2–7.8)	2.6 (1.7–3.4)
In a committed relationship	3529 (58.4)	19.1 (17.8–20.4)	13.8 (12.7–14.9)	6.7 (5.9–7.5)
Divorced/separated/widowed	1181 (19.6)	34.2 (31.5–36.9)	28.4 (25.8–30.9)	13.2 (11.3–15.1)
Refused to say	4 (0.1)	—	—	—
Employment				
Employed	3063 (50.7)	17.7 (16.3–19.0)	13.6 (12.4–14.8)	6.1 (5.3–7.0)
Not employed	2952 (48.9)	21.8 (20.3–23.3)	16.5 (15.1–17.8)	8.1 (7.1–9.1)
Missing	24 (0.4)	—	—	—
Wealth index				
First quintile	1230 (20.4)	18.1 (16.0–20.3)	14.3 (12.4–16.3)	6.8 (5.4–8.2)
Second quintile	1211 (20.1)	21.6 (19.2–23.9)	16.4 (14.3–18.4)	7.8 (6.3–9.4)
Third quintile	1220 (20.2)	21.4 (19.1–23.7)	16.1 (14.1–18.2)	7.8 (6.3–9.3)
Fourth quintile	1197 (19.8)	19.5 (17.3–21.8)	15.0 (13.0–17.1)	8.0 (6.5–9.6)
Fifth quintile	1164 (19.3)	18.5 (16.2–20.7)	13.4 (11.6–15.5)	5.0 (3.7–6.2)
Missing	17 (0.3)	—	—	—
Physically active*				
Yes	4180 (69.2)	16.9 (15.7–18.0)	13.3 (12.2–14.3)	6.2 (5.4–6.9)
No	1851 (30.7)	26.4 (24.4–28.4)	19.1 (17.3–20.9)	9.2 (7.9–10.5)
Missing	8 (0.1)	—	—	—
Smoker†				
Yes	1509 (25.0)	24.8 (22.6–27.0)	19.7 (17.7–21.8)	9.3 (7.8–10.7)
No	4525 (74.9)	18.1 (17.0–19.2)	13.5 (12.5–14.5)	6.4 (5.7–7.1)
Missing	5 (0.1)	—	—	—
Alcohol‡				
Yes	1575 (26.1)	20.4 (18.5–22.4)	16.5 (14.7–18.3)	7.8 (6.5–9.1)
No	4464 (73.9)	19.5 (18.4–20.7)	14.5 (13.5–15.6)	6.8 (6.1–7.6)
Fruits and vegetables consumption§				
Yes	468 (7.8)	15.8 (12.5–19.1)	10.9 (8.1–13.7)	7.7 (5.3–10.1)
No	5563 (92.1)	20.1 (19.1–21.2)	15.4 (14.5–16.4)	7.0 (6.4–7.7)
Missing	8 (0.1)	—	—	—

* At least 30 min of moderate-to-vigorous activity for a minimum of 5 days a week

† Any history of smoking.

‡ Use in the 3 months before study.

§ At least 5 servings weekly.

CI, confidence interval; IQR, interquartile range; BMI, body mass index.

well as severity of the pain. Participants were asked to state if there was no interference with any routine activity; mild interference where most routine activities could still be undertaken; moderate interference where only routine activities judged to be of importance could be undertaken; and severe interference where participants could not undertake any activities except assisted. To assess severity of pain, participants were asked to determine how intense their pain was on a scale of 1 to 10, 1 being the lowest and 10 being the most severe pain. Severity of pain was classified according to a 10-point Numerical Rating Scale (NRS) where mild pain corresponded to NRS 1 to 3, moderate pain NRS 4 to 6, and severe pain NRS 7 to 10. Participants with chronic pain and moderate-to-severe restriction of activities or severe pain intensity were considered to have high-impact chronic pain.[14]

2.4. Data collection and statistical analysis

Statistical analyses were conducted in Stata (16,1, StataCorp LLC, College Station, TX).[23] Descriptive statistics, such as mean and standard deviation and median and interquartile range were used for continuous variables, while frequency and percentage were used for categorical variables.

Unspecified pain, chronic pain, and high-impact chronic pain were analyzed independently with comparisons made against the rest of the population who did not have unspecified pain, chronic pain, or high-impact chronic pain, respectively. We used a multivariable logistic regression model to assess factors associated with each of unspecified pain, chronic pain, and high-impact chronic pain, accounting for the cluster design used in the survey. The model estimates were pooled across both districts while accounting for individual districts and settlements (rural or urban). Ease of access was not included in the model as this was represented in the settlements, since urban and rural settlements were generally easy and difficult to access, respectively. Variables included in the final model were decided using backward stepwise selection technique. Statistical significance was set at P-value <0.05. Participants with missing data were excluded from the regression analyses.

2.5. Ethics statement

All procedures were performed in line with the ethical standards laid out in the Declaration of Helsinki.[5] Participants received information on all research procedures in Sesotho and provided written informed consent. Illiterate participants gave consent by thumbprint, and a witness who was not involved in the study cosigned the form. Once the informed consent process was completed, a signed copy of the form was retained by study staff and a copy was given to the participant. This study was reviewed by the Ethics Committee Northwest and Central Switzerland (ID AO_2021-00056) and approved by the National Health Research Ethics Committee in Lesotho (ID 139-2021).

2.6. Patient and public involvement

This survey is part of the Community-Based chronic Care project Lesotho (ComBaCaL; www.combacal.org). It was designed together with the ComBaCaL steering committee that includes a community representative, as well as representatives from the Ministry of Health of Lesotho. The survey was discussed with local authorities (village chiefs, local Ministry of Health leaders), who were engaged throughout the study.

3. Results

Figure 1 displays the study flow. Of 7412 participants surveyed, 6039 were aged 18 years or older, eligible, and included in this analysis. Participants' sociodemographic characteristics and prevalence of unspecified pain, chronic pain and high-impact chronic pain for each characteristic are presented in **Table 1** (see S1 table, supplemental digital content, http://links.lww.com/PR9/A363). The overall median age of participants was 39 years (interquartile range [IQR]: 27–58), and 3153 of 6039 participants

Table 2

Prevalence of unspecified pain, chronic pain, and high-impact chronic pain, by clinical characteristics.

Variable	Enrolled	Pain	Chronic pain	High-impact chronic pain
	N = 6039	% (95% CI)	% (95% CI)	% (95% CI)
Arterial hypertension				
Yes	1302 (21.5)	35.3 (32.8–38.0)	29.0 (26.6–31.5)	14.4 (12.6–16.4)
No	4726 (78.3)	15.5 (14.5–16.5)	11.2 (10.3–12.1)	5.1 (4.5–5.7)
Missing	11 (0.2)	—	—	—
Diabetes mellitus				
Diabetes	257 (4.3)	35.8 (30.2–41.8)	28.8 (23.6–34.6)	17.9 (13.7–23.1)
Prediabetes	36 (0.6)	36.1 (22.3–52.7)	30.6 (17.8–47.2)	16.7 (7.5–33.1)
No	5210 (86.3)	19.1 (18.9–20.2)	14.3 (13.4–15.3)	6.6 (6.0–7.3)
Missing	536 (8.9)	—	—	—
Depression (PHQ-9)				
Moderate/high risk	98 (1.6)	48.0 (38.3–57.8)	39.8 (30.6–49.8)	32.7 (24.0–42.6)
Minimal to low risk	5930 (98.2)	19.3 (18.3–20.3)	14.6 (13.7–15.5)	6.7 (6.1–7.3)
Missing	11 (0.2)	—	—	—
Anxiety (GAD-7)				
Moderate/high risk	43 (0.7)	48.8 (34.4–63.4)	41.9 (28.2–56.9)	34.9 (21.9–50.5)
Minimal to low risk	5990 (99.2)	19.5 (18.6–20.6)	14.9 (14.0–15.8)	6.9 (6.3–7.5)
Missing	6 (0.1)	—	—	—
Living with HIV				
Yes	923 (15.3)	22.6 (20.1–25.5)	16.5 (14.2–19.0)	6.9 (5.5–8.8)
No	5113 (84.7)	19.3 (18.2–20.4)	14.8 (13.9–15.8)	7.1 (6.4–7.9)
Missing	3 (0.1)	—	—	—

GAD-7, Generalized Anxiety Disorder Questionnaire; PHQ-9, Patient Health Questionnaire; HIV, human immune deficiency virus.

(52.2%) were female. As depicted in **Table 2** (displayed for each pain category in the supplemental digital content, S2 table, http://links.lww.com/PR9/A363), 1302 of 6039 participants (21.5%) of the study population had arterial hypertension, 257 of 6039 participants (4.3%) had diabetes mellitus, 98 of 6039 participants (1.6%) were at moderate-to-high risk of depression, 43 of 6039 participants (0.7%) were at moderate-to-high risk of generalized anxiety disorder, and 923 of 6039 participants (15.3%) reported to live with HIV. Overall, 1194 of 6039 participants (19.8%) had unspecified pain (95% confidence interval [CI]: 18.8–20.8), 909 of 6039 participants (15.1%) had chronic pain (95% CI: 14.2–16.0), and 428 of 6039 participants (7.1%) had high-impact chronic pain (95% CI: 6.5–7.8) corresponding to 47.1% (428/909) among participants who had chronic pain.

For participants with unspecified pain, chronic pain, and high-impact chronic pain, the median age ranged from 58 years to 61 years. All pain categories increased with rising age and were higher among women than men (**Fig. 2**). As provided in **Table 2**, the prevalence of unspecified pain, chronic pain, and high-impact chronic pain were higher among participants with arterial hypertension, diabetes mellitus, risk of depression, or risk of anxiety disorder.

For all pain categories, the most common locations were the limbs, followed by the back (**Fig. 3** and S1 figure, supplemental digital content, http://links.lww.com/PR9/A363).

The results of univariate and multivariable logistic regression models for the pain categories are given in supplemental digital content (see S3 table, http://links.lww.com/PR9/A363) and **Figures 4 to 6**. Compared with participants aged 18 to 24 years, older participants had higher odds of unspecified pain. Similarly, participants living in Mokhotlong district (adjusted odds ratio [aOR], 2.43; 95% CI: 1.93–3.06; $P < 0.001$), who smoked (aOR, 1.40; 95% CI: 1.17–1.69; $P < 0.001$), had arterial hypertension (aOR, 1.41; 95% CI: 1.18–1.68; $P < 0.001$), or were at high/

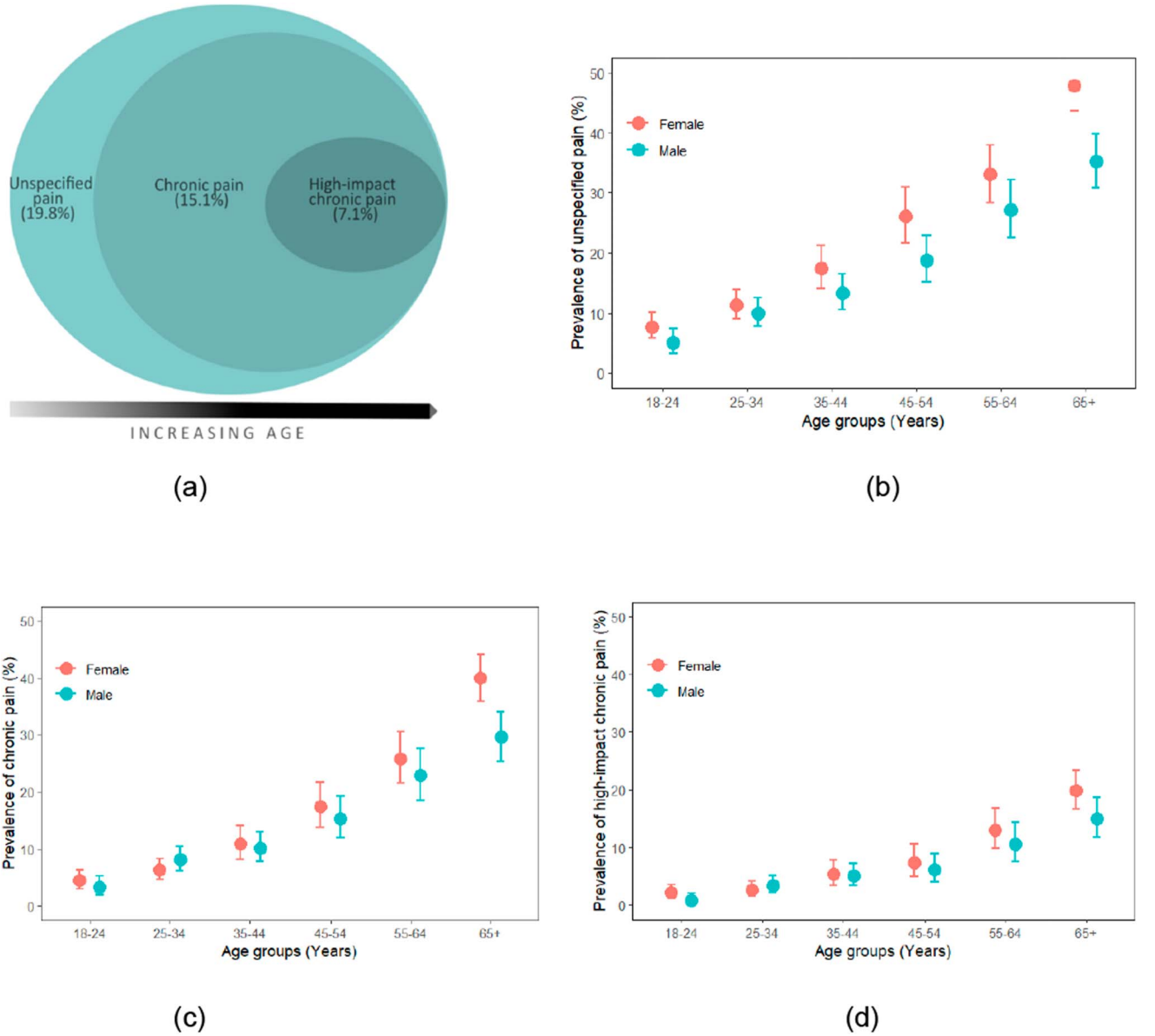

Figure 2. (A) Nested area chart showing pain categories as age increases. Prevalence (and 95% confidence interval) of (B) unspecified pain, (C) chronic pain, and (D) high-impact chronic pain, for each age group stratified by sex.

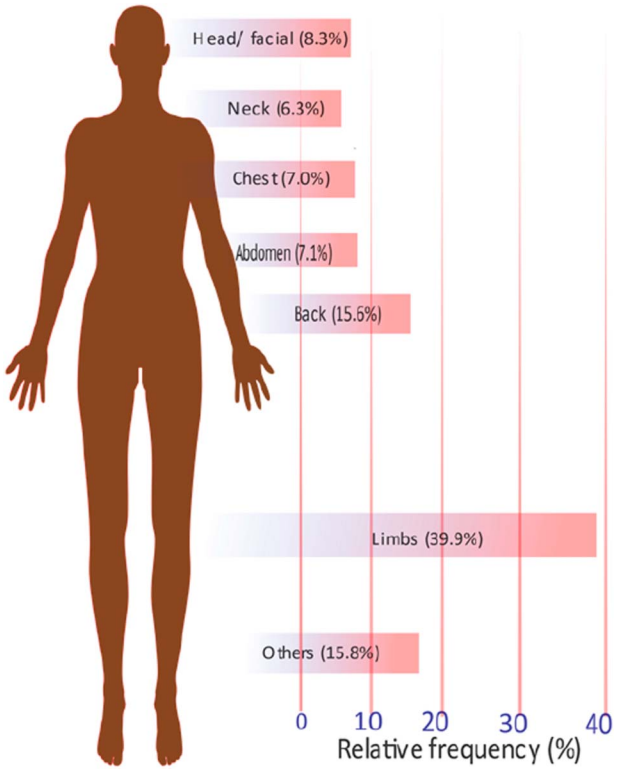

Figure 3. Common body locations affected by unspecified pain.

moderate risk of depression (aOR, 2.93; 95% CI: 1.74–4.93; $P < 0.001$), or at high/moderate risk of generalized anxiety disorder (aOR, 1.84; 95% CI: 1.02–3.31; $P = 0.041$) had higher odds of having unspecified pain. Conversely, participants who were male (aOR, 0.65; 95% CI: 0.55–0.76; $P < 0.001$) or who were physically active (aOR, 0.64; 95% CI: 0.55–0.76; $P < 0.001$) were less likely to have unspecified pain.

As seen with unspecified pain, higher age groups were associated with higher odds of chronic pain. Living in Mokhotlong district (aOR, 2.75; 95% CI: 2.18–3.46; $P < 0.001$), smoking (aOR, 1.34; 95% CI: 1.09–1.64; $P = 0.006$), arterial hypertension (aOR, 1.53; 95% CI: 1.26–1.86; $P < 0.001$), and moderate-to-high risk of depression (aOR, 3.45; 95% CI: 1.95–6.10; $P < 0.001$) were associated with higher odds of chronic pain. Male participants (aOR, 0.79; 95% CI: 0.65–0.96; $P = 0.019$) and physically active participants (aOR, 0.80; 95% CI: 0.67–0.95; $P = 0.010$), were less likely to have chronic pain.

Like unspecified pain and chronic pain, older participants were more likely to experience high-impact chronic pain. Also, participants living in Mokhotlong district had higher odds of high-impact chronic pain (aOR, 1.60; 95% CI: 1.19–2.17; $P = 0.002$). Compared with the fifth (highest) wealth quintile, other wealth quintiles had higher odds of high-impact chronic pain. Arterial hypertension (aOR, 1.45; 95% CI: 1.11–1.90; $P = 0.007$), diabetes mellitus (aOR, 1.90; 95% CI: 1.26–2.87; $P = 0.007$), moderate-to-high risk of depression (aOR, 5.09; 95% CI: 2.89–8.97; $P < 0.001$), and moderate-to-high risk of generalized anxiety disorder (aOR, 2.69; 95% CI: 1.16–6.26; $P = 0.022$) were associated with higher odds of high-impact chronic pain.

4. Discussion

This population-based survey assessed the prevalence of unspecified pain, chronic pain, and high-impact chronic pain in the general population in Lesotho. It is the first to evaluate high-impact chronic pain in Africa. The prevalence of unspecified pain, chronic pain, and high-impact chronic pain were 19.8%, 15.1%, and 7.1%, respectively. Unspecified pain and chronic pain were

Variables	Pain present	Pain absent	aOR (95% CI)
Age group			
25-34 vs 18-24	145	1217	1.73 (1.24 to 2.39)
35-44 vs 18-24	151	845	2.51 (1.78 to 3.52)
45-54 vs 18-24	173	605	3.74 (2.68 to 5.23)
55-64 vs 18-24	220	506	5.46 (3.95 to 7.56)
≥65 vs 18-24	429	586	8.73 (6.26 to 12.17)
Sex			
Male vs Female	488	2398	0.65 (0.55 to 0.76)
District			
Mokhotlong vs Butha Buthe	743	2134	2.43 (1.93 to 3.06)
Physically active*			
Yes vs No	705	3475	0.64 (0.55 to 0.76)
Smoker*			
Yes vs No	374	1135	1.40 (1.17 to 1.69)
Arterial hypertension			
Present vs Absent	460	842	1.41 (1.18 to 1.68)
Depression (PHQ-9)			
Moderate/high risk vs minimal/low risk	47	51	2.93 (1.74 to 4.93)
Anxiety (GAD-7)			
Moderate/high risk vs minimal/low risk	21	22	1.84 (1.02 to 3.31)

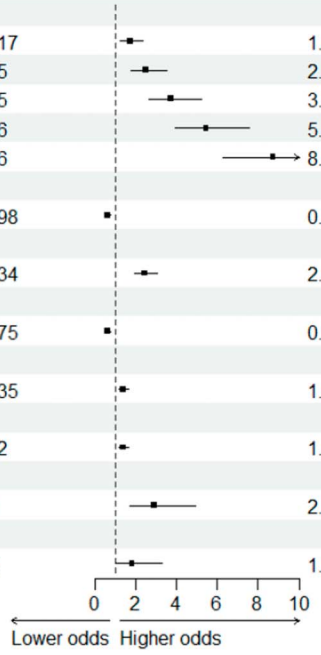

Figure 4. Multivariable logistic regression model for unspecified pain. aOR, adjusted odds ratio; CI, confidence interval; * at least 30 minutes of moderate-to-vigorous activity for a minimum of 5 days a week; any history of smoking; GAD-7, Generalized Anxiety Disorder Questionnaire; PHQ-9, Patient Health Questionnaire.

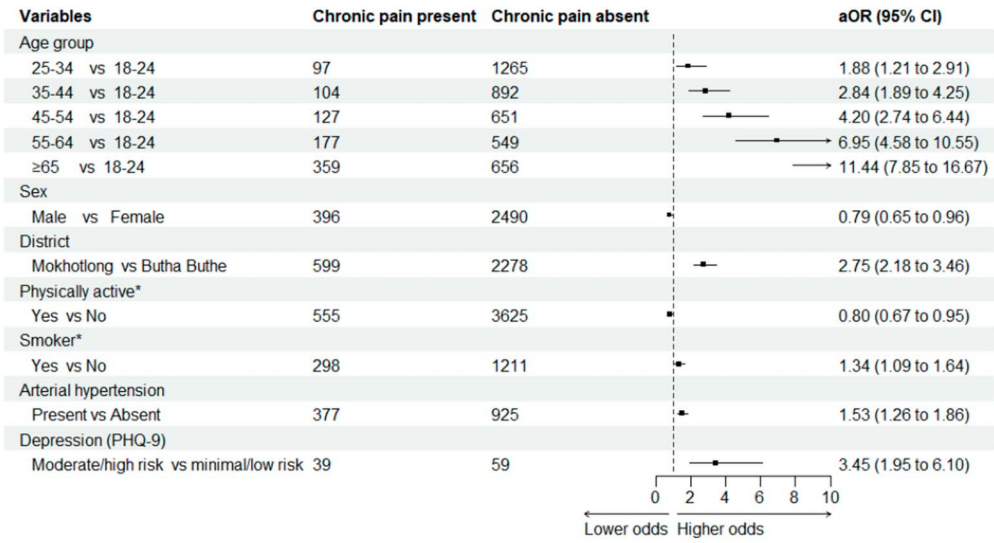

Figure 5. Multivariable logistic regression model for chronic pain. aOR, adjusted odds ratio; CI, confidence interval; * at least 30 minutes of moderate-to-vigorous activity for a minimum of 5 days a week; any history of smoking; PHQ-9, Patient Health Questionnaire.

associated with increasing age, sex, living in the more mountainous in Mokhotlong district, smoking, arterial hypertension, and moderate-to-high risk of depression. In addition to its association with increasing age, high-impact chronic pain was also associated with arterial hypertension, diabetes mellitus, moderate-to-high risk of depression, and moderate-to-high risk of generalized anxiety disorder. Furthermore, participants from lower wealth quintiles were more likely to have high-impact chronic pain compared with those in the highest wealth quintile. Our findings indicate that a fifth of adults in the study area experience pain disorder. Almost half of those with chronic pain have high-impact chronic pain.

Recent data on unspecified pain within Africa are scant. However, a global prevalence of pain study across 52 countries using data from the World Health Survey 2002 to 2004 presents prevalence figures in 14 countries from Africa including South Africa, Zambia, Namibia, Zimbabwe, and Malawi.[49] This study found an average unspecified pain prevalence of 28% among included African countries, with a range of 25% to 37%.[49] Reasons that explain the lower prevalence of unspecified pain in

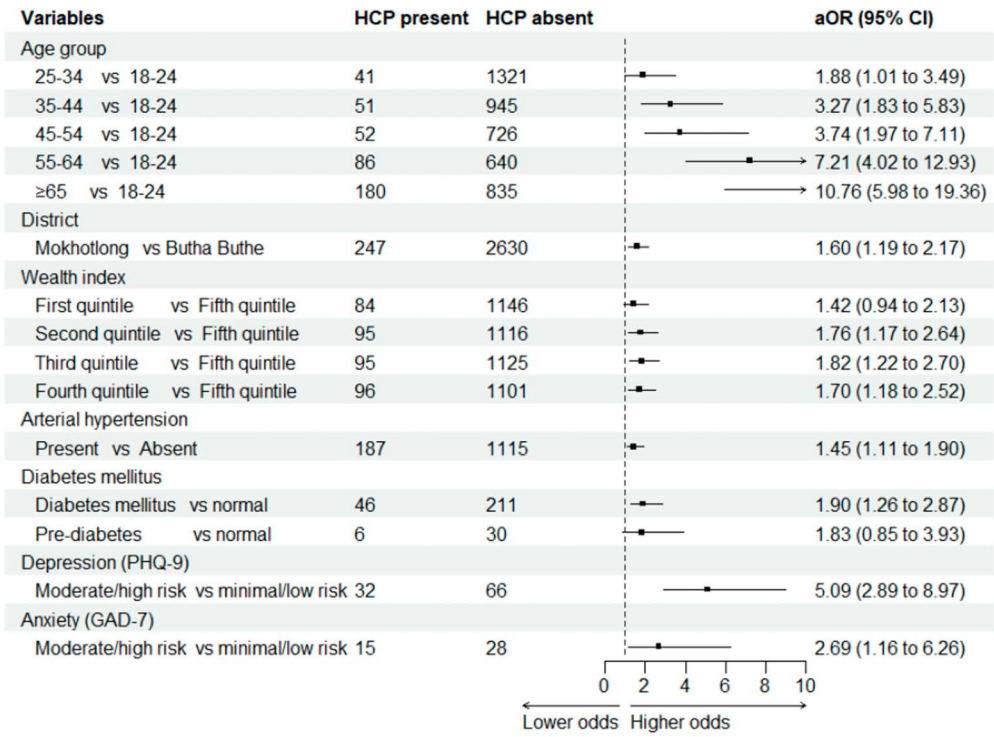

Figure 6. Multivariable logistic regression model for high-impact chronic pain. HCP, high-impact chronic pain; aOR, adjusted odds ratio; CI, confidence interval; *GAD-7, Generalized Anxiety Disorder Questionnaire; PHQ-9, Patient Health Questionnaire.

our study compared with that in the global prevalence of pain study include that the latter study consisted of an older population, who were mostly female and who predominantly lived in rural areas—factors associated with higher prevalence of pain.[4,7,49] Nonetheless, the chronic pain prevalence of 15.1% in our study is similar to the 18% pooled prevalence of chronic pain from several low-income and middle-income countries.[40] A study conducted in neighboring South Africa reports a chronic pain prevalence of 18%.[28] Interestingly, the South African study also displays prevalence figures for the country's regions, and Free State and KwaZulu-Natal, the proximal provinces to our study area had 12% and 13% chronic pain prevalence, respectively.[28] In our study, we found the prevalence of high-impact chronic pain to be 7.1%. There are no studies in Africa on high-impact chronic pain with which to compare this finding. However, our results are consistent with the 6.9% to 8% of adults with high-impact chronic pain in the United States[14,38] and 7.8% in the United Kingdom.[18] In Saudi Arabia, high-impact chronic pain was found to affect 4% of the adult population.[1] This low figure may be due to differences in the operationalized definition of high-impact chronic pain applied in the Saudi Arabian study.

The most common pain locations for all pain categories were the limbs and the back. This is consistent with other studies.[28,48] We found that the odds of experiencing unspecified pain and chronic pain were higher with increasing age, among women, and among those living in the mountainous Mokhotlong region, similar to results from other studies.[11,26,28,32,49] In this study, physically active participants were less likely to have unspecified pain and chronic pain, whereas smoking was associated with higher odds of pain. Regular physical activity prevents pain,[31] and a systematic review has shown evidence of an exercise program reducing the risk of pain.[15] Indeed, several guidelines advocate physical activity as an effective intervention to reduce pain.[19] Conversely, the relationship between pain and smoking is thought to be bidirectional with smoking increasing the risk of pain and sufferers in turn relying on smoking as a coping mechanism.[6,13]

High-impact chronic pain was higher among those in lower wealth index quintiles compared with the highest wealth index quintile. In their recent study, Weissman et al. report similar findings in the United States where poorer participants were unable to afford the cost of medical care and had higher odds of high-impact chronic pain.[46] Several other studies have shown identical findings suggesting that higher odds of pain in low wealth groups could be due to poor access to health care.[14,28,49]

A further interesting finding in our study is the number of comorbidities among participants with high-impact chronic pain where sufferers had higher likelihood of arterial hypertension, diabetes mellitus, and higher risks of depression and anxiety disorder. Although mechanisms underlying this are not yet fully understood, other studies similarly reported multimorbidity among people experiencing high-impact chronic pain.[12,20,37] Multidisciplinary and multimodal approaches are required within pain medicine,[48] and appropriate pain classifications ensure that available resources are efficiently deployed for diagnosis, workup, and treatment.[9] The effort to separate high-impact chronic pain from chronic pain without activity limitation/participation restriction represents such a classification attempt aimed at improving efficiency in pain management. Our study helps solve the need for more data within the African region to adequately characterize the pain burden within the general population and will be useful to stakeholders within pain medicine in the region.

Important strengths in our study are the large sample size, a systematic sampling of the study population, and a high response rate of participants. In addition, it is the first study in Africa to produce estimates on high-impact chronic pain. This study has several limitations. First, due to the cross-sectional nature of the survey, causality could not be established. As the presence of pain was self-reported, there is a potential for recall bias, especially regarding unspecified pain. Furthermore, in grading the level of pain interference, mild interference and moderate interference were sometimes difficult to define, and participants occasionally could not distinguish routine activities from crucial activities.

To conclude, we conducted a study to determine the prevalence of unspecified pain, chronic pain, and high-impact chronic pain in a general population in Lesotho and to assess their determinants. We found associations with increasing age, sex, location, smoking, elevated blood pressure, moderate-to-high risk of depression, diabetes mellitus, and moderate-to-high risk of generalized anxiety disorder. Participants with high-impact chronic pain had the highest prevalence of comorbidities. Furthermore, participants from less wealthier households had higher chances of having high-impact chronic pain compared with participants in the highest wealth quintile. These findings may encourage health systems in Lesotho and similar settings to integrate pain management into chronic care provision.

Disclosures

The authors have no conflict of interest to declare.

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References

[1] Almalki MT, BinBaz SS, Alamri SS, Alghamdi HH, El-Kabbani AO, Al Mulhem AA, Alzubaidi SA, Altowairqi AT, Alrbeeai HA, Alharthi WM, Alswat KA. Prevalence of chronic pain and high-impact chronic pain in Saudi Arabia. Saudi Med J 2019;40:1256–66.
[2] Amstutz A, Lejone TI, Khesa L, Muhairwe J, Nsakala BL, Tlali K, Bresser M, Vanobberghen F, Kopo M, Kao M, Klimkait T, Battegay M, Labhardt ND, Glass TR. The HOSENG trial—effect of the provision of oral self-testing for absent and refusing individuals during a door-to-door HIV-testing campaign on testing coverage: protocol of a cluster-randomized clinical trial in rural Lesotho. Trials 2019;20:496.
[3] Andrew R, Derry S, Taylor RS, Straube S, Phillips CJ. The costs and consequences of adequately managed chronic non-cancer pain and chronic neuropathic pain. Pain Pract 2014;14:79–94.
[4] Andrews P, Steultjens M, Riskowski J. Chronic widespread pain prevalence in the general population: a systematic review. Eur J Pain 2018;22:5–18.
[5] General Assembly of the World Medical Association. World medical association declaration of helsinki: ethical principles for medical research involving human subjects. J Am Coll Dentists 2014;81:14–8.
[6] Bakhshaie J, Ditre JW, Langdon KJ, Asmundson GJ, Paulus DJ, Zvolensky MJ. Pain intensity and smoking behavior among treatment seeking smokers. Psychiatry Res 2016;237:67–71.
[7] Bartley EJ, Fillingim RB. Sex differences in pain: a brief review of clinical and experimental findings. Br J Anaesth 2013;111:52–8.
[8] Blyth FM, Huckel Schneider C. Global burden of pain and global pain policy-creating a purposeful body of evidence. PAIN 2018;159:S43–S48.
[9] Bonezzi C, Fornasari D, Cricelli C, Magni A, Ventriglia G. Not all pain is created equal: basic definitions and diagnostic work-up. Pain Ther 2020;9:1–15.
[10] Breivik H, Collett B, Ventafridda V, Cohen R, Gallacher D. Survey of chronic pain in Europe: prevalence, impact on daily life, and treatment. Eur J Pain 2006;10:287–333.
[11] Coggon D, Ntani G, Palmer KT, Felli VE, Harari R, Barrero LH, Felknor SA, Gimeno D, Cattrell A, Serra C, Bonzini M, Solidaki E, Merisalu E, Habib RR, Sadeghian F, Masood Kadir M, Warnakulasuriya SS, Matsudaira K, Nyantumbu B, Sim MR, Harcombe H, Cox K, Marziale MH, Sarquis LM, Harari F, Freire R, Harari N, Monroy MV, Quintana LA, Rojas M, Salazar Vega EJ, Harris CE, Vargas-Prada S, Martinez MJ, Delclos G, Benavides FG, Carugno M, Ferrario MM, Pesatori AC, Chatzi L, Bitsios P, Kogevinas M, Oha K, Sirk T, Sadeghian A, Peiris-John RJ, Sathiakumar N, Wickremasinghe RA, Yoshimura N, Kelsall HL, Hoe VC, Urquhart DM, Derrett S, McBride D, Herbison P, Gray A. Disabling musculoskeletal pain in working populations: is it the job, the person, or the culture? PAIN 2013;154:856–63.
[12] Cook CE, George SZ, Lentz T, Park C, Shaffrey CI, Goodwin CR, Than KD, Gottfried ON. High-impact chronic pain transition in lumbar surgery recipients. Pain Med 2022;24:258–68.
[13] Croghan IT, Hurt RT, Ganesh R, Bhagra O, Fischer KM, Vincent A, Hays JT, Bierle DM, Schroeder DR, Fuehrer DL, Nanda S. The association of current tobacco status with pain and symptom severity in fibromyalgia patients. Mayo Clinic Proc Innov Qual Outcomes 2021;5:614–24.
[14] Dahlhamer J, Lucas J, Zelaya C, Nahin R, Mackey S, DeBar L, Kerns R, Von Korff M, Porter L, Helmick C. Prevalence of chronic pain and high-impact chronic pain among adults—United states, 2016. MMWR Morb Mortal Wkly Rep 2018;67:1001–6.
[15] de Campos TF, Maher CG, Steffens D, Fuller JT, Hancock MJ. Exercise programs may be effective in preventing a new episode of neck pain: a systematic review and meta-analysis. J Physiother 2018;64:159–65.
[16] Eccleston C, Begley E, Birkinshaw H, Choy E, Crombez G, Fisher E, Gibby A, Gooberman-Hill R, Grieve S, Guest A, Jordan A, Lilywhite A, Macfarlane GJ, McCabe C, McBeth J, Pickering AE, Pincus T, Sallis HM, Stone S, Van der Windt D, Vitali D, Wainwright E, Wilkinson C, de C Williams AC, Zeyen A, Keogh E. The establishment, maintenance, and adaptation of high- and low-impact chronic pain: a framework for biopsychosocial pain research. PAIN 2023;164:2143–7.
[17] Elzahaf RA, Tashani OA, Unsworth BA, Johnson MI. The prevalence of chronic pain with an analysis of countries with a human development index less than 0.9: a systematic review without meta-analysis. Curr Med Res Opin 2012;28:1221–9.
[18] Fayaz A, Croft P, Langford R, Donaldson L, Jones G. Prevalence of chronic pain in the UK: a systematic review and meta-analysis of population studies. BMJ Open 2016;6:e010364.
[19] Geneen LJ, Moore RA, Clarke C, Martin D, Colvin LA, Smith BH. Physical activity and exercise for chronic pain in adults: an overview of cochrane reviews. Cochrane Database Syst Rev 2017;4:Cd011279.
[20] George SZ, Bolognesi MP, Bhavsar NA, Penrose CT, Horn ME. Chronic pain prevalence and factors associated with high impact chronic pain following total joint arthroplasty: an observational study. J Pain 2022;23:450–8.
[21] Goldberg DS, McGee SJ. Pain as a global public health priority. BMC Public Health 2011;11:770–5.
[22] González Fernández L, Firima E, Gupta R, Sematle MP, Khomolishoele M, Molulela M, Bane M, Meli R, Tlahali M, Lee T, Chammartin F, Gerber F, Lejone TI, Ayakaka I, Weisser M, Amstutz A, Labhardt ND. Prevalence and determinants of cardiovascular risk factors in Lesotho: a population-based survey. Int Health 2023;16:313–24,.
[23] Hartung C, Lerer A, Anokwa Y, Tseng C, Brunette W, Borriello G. Open data kit: tools to build information services for developing regions. Proceedings of the 4th ACM/IEEE International Conference on Information and Communication Technologies and Development, 2010. pp. 1–12.
[24] Hartvigsen J, Hancock MJ, Kongsted A, Louw Q, Ferreira ML, Genevay S, Hoy D, Karppinen J, Pransky G, Sieper J, Smeets, RJ, Underwood, M, Buchbinder, R, Hartvigsen, J, Cherkin, D, Foster, NE, Maher, CG, Underwood, M, van Tulder, M, Anema, JR, Chou, R, Cohen, SP, Menezes Costa, L, Croft, P, Ferreira, M, Ferreira, PH, Fritz, JM, Genevay, S, Gross, DP, Hancock, MJ, Hoy, D, Karppinen, J, Koes, BW, Kongsted, A, Louw, Q, Öberg, B, Peul, WC, Pransky, G, Schoene, M, Sieper, J, Smeets, RJ, Turner, JA, Woolf, A. What low back pain is and why we need to pay attention. Lancet 2018;391:2356–67.
[25] Institute of Medicine (US) Committee on Advancing Pain Research, Care, and Education. Relieving pain in America: A blueprint for transforming prevention, care, education, and research. Washington (DC): National Academies Press (US), 2011.
[26] Jackson T, Thomas S, Stabile V, Shotwell M, Han X, McQueen K. A systematic review and meta-analysis of the global burden of chronic pain without clear etiology in Low- and middle-income countries: trends in heterogeneous data and a proposal for new assessment methods. Anesth Analgesia 2016;123:739–48.
[27] Kahere M, Hlongwa M, Ginindza TG. A scoping review on the epidemiology of chronic low back pain among adults in Sub-Saharan Africa. Int J Environ Res Public Health 2022;19.2964.
[28] Kamerman PR, Bradshaw D, Laubscher R, Pillay-van Wyk V, Gray GE, Mitchell D, Chetty S. Almost 1 in 5 South African adults have chronic pain: a prevalence study conducted in a large nationally representative sample. PAIN 2020;161:1629–35.
[29] Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med 2001;16:606–13.
[30] Leadley RM, Armstrong N, Reid KJ, Allen A, Misso KV, Kleijnen J. Healthy aging in relation to chronic pain and quality of life in Europe. Pain Pract 2014;14:547–58.
[31] Lee IM, Shiroma EJ, Lobelo F, Puska P, Blair SN, Katzmarzyk PT. Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy. Lancet 2012;380:219–29.
[32] Mansfield KE, Sim J, Jordan JL, Jordan KP. A systematic review and meta-analysis of the prevalence of chronic widespread pain in the general population. PAIN 2016;157:55–64.
[33] Mäntyselkä P, Kumpusalo E, Ahonen R, Kumpusalo A, Kauhanen J, Viinamäki H, Halonen P, Takala J. Pain as a reason to visit the doctor: a study in Finnish primary health care. PAIN 2001;89:175–80.
[34] Meucci RD, Fassa AG, Faria NMX. Prevalence of chronic low back pain: systematic review. Revista Saude Publica 2015;49:73.
[35] Mills S, Torrance N, Smith BH. Identification and management of chronic pain in primary care: a review. Curr Psychiatry Rep 2016;18:22.
[36] Mohanty SK, Ambade M, Upadhyay AK, Mishra RS, Pedgaonkar SP, Kampfen F, O'Donnell O, Maurer J. Prevalence of pain and its treatment among older adults in India: a nationally representative population-based study. PAIN 2023;164:336–48.
[37] Pitcher MH, Von Korff M, Bushnell MC, Porter L. Prevalence and profile of high-impact chronic pain in the United States. J Pain 2019;20:146–60.
[38] Rikard SM, Strahan AE, Schmit KM, Guy GP Jr. Chronic pain among adults—United States, 2019–2021. MMWR Morb Mortal Wkly Rep 2023;72, 379–85.
[39] Rutstein SO. Steps to constructing the new DHS wealth index. Rockville, MD: ICF International, 2015. p. 6.

[40] Sá KN, Moreira L, Baptista AF, Yeng LT, Teixeira MJ, Galhardoni R, de Andrade DC. Prevalence of chronic pain in developing countries: systematic review and meta-analysis. PAIN Rep 2019;4:e779.
[41] Schappert SM, Burt CW. Ambulatory care visits to physician offices, hospital outpatient departments, and emergency departments: United States, 2001–02. Vital Health Stat 2006;13:1–66.
[42] Smith BH, Elliott AM, Chambers WA, Smith WC, Hannaford PC, Penny K. The impact of chronic pain in the community. Fam Pract 2001;18:292–9.
[43] Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. Arch Intern Med 2006;166:1092–97.
[44] Treede RD, Rief W, Barke A, Aziz Q, Bennett MI, Benoliel R, Cohen M, Evers S, Finnerup NB, First MB, Giamberardino MA, Kaasa S, Korwisi B, Kosek E, Lavand'homme P, Nicholas M, Perrot S, Scholz J, Schug S, Smith BH, Svensson P, Vlaeyen JWS, Wang SJ. Chronic pain as a symptom or a disease: the IASP classification of chronic pain for the International Classification of Diseases (ICD-11). PAIN 2019;160:19–27.
[45] von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The strengthening the reporting of observational studies in epidemiology (STROBE) statement: guidelines for reporting observational studies. J Clin Epidemiol 2008;61:344–9.
[46] Weissman JD, Russell D, Taylor J. The relationship between financial stressors, chronic pain, and high-impact chronic pain: findings from the 2019 National Health Interview survey. Public Health Reports 2023;138: 438–46.
[47] Wu A, March L, Zheng X, Huang J, Wang X, Zhao J, Blyth FM, Smith E, Buchbinder R, Hoy D. Global low back pain prevalence and years lived with disability from 1990 to 2017: estimates from the global burden of disease study 2017. Ann Transl Med 2020;8.299.
[48] Yong RJ, Mullins PM, Bhattacharyya N. Prevalence of chronic pain among adults in the United States. PAIN 2022;163:e328–e332.
[49] Zimmer Z, Fraser K, Grol-Prokopczyk H, Zajacova A. A global study of pain prevalence across 52 countries: examining the role of country-level contextual factors. PAIN 2022;163:1740–50.