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Prevalence and sites of pain in remote-living older Aboriginal Australians, and associations with depressive symptoms and disability

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Dina Lo Giudice, Leon Flicker, Kate Smith, and David Atkinson conceived and designed the study. Aaron Wong wrote the initial draft of the manuscript, and interpreted the data. Zoë Hyde performed the statistical analyses. Dina Lo Giudice, Leon Flicker, Linda Skeaf, and Roslyn Malay collected the data. All authors reviewed and revised the manuscript for intellectual content, and provided approval for its submission.

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Introduction

Pain is a pervasive condition that transcends cultural boundaries with potential wide-ranging effects on the individual and societal level. Chronic pain affects one in five Australians, with a higher prevalence among older Australians and is up to 30% more likely in residents living in rural and remote areas (1). It is a costly public health problem associated with increased rates of poor physical health, mental health issues and functional impairment (2, 3). Various factors are known to influence the expression and experience of pain, including age, sex,

early life/historical traumatic exposure, previous pain experiences, lifestyle aspects, cultural background and socioeconomic status (2, 4-6). There are disproportionate burdens and impacts of pain on rural and remote populations. Higher rates of injury are possibly related to the nature of rural and remote industries. Increased frequency of obesity and physical inactivity are also associated with poorer musculoskeletal health, leading to chronic pain conditions and disability (1, 3).

Aboriginal Australians account for 3% of the total Australian population. Approximately 18% are aged ≥45 years and about one in five live in remote areas (7). Compared to their non-Indigenous counterparts, significant health disparities persist including higher rates of chronic diseases, geriatric syndromes, disability and premature mortality (7-9). A previous preliminary study conducted by members of the research team using a different screening question found that pain was present in approximately half of older Aboriginal people living in remote communities, with 18% reporting persistent pain (9). The main cause of pain and disability was attributable to musculoskeletal conditions, with evidence of greater musculoskeletal pain burden among Australian Aboriginal and Torres Strait Islander people and in Indigenous populations internationally (10). Aboriginal people are also less likely to access primary care and have joint replacement surgery (10). This problem is further compounded by communication barriers, cultural factors (4, 10, 11) and known patterns of rural and remote health disadvantage such as diminished access to care, lower levels of health literacy and lower educational attainment (1). Moreover, pain has considerable impact on Indigenous people, affecting multiple life domains including employment, daily function, emotional well-being and participation in family and cultural activities (10, 12). Understanding Aboriginal history, including previous government policies impacting on Aboriginal health and well-being, is vital in understanding the pain experience, employing a life course approach to improving outcomes and informing culturally respectful clinician encounters and management strategies (8, 13). Owing to past discrimination by, and exclusion from, hospitals and health services, some Aboriginal people may mistrust mainstream health services, perceiving them as threatening and alienating environments.

Additionally, Aboriginal people may be less likely to complain about pain, owing to factors such as fear of separation from family (13).

Despite being at particular risk, there is limited research on the prevalence, nature and associated factors of pain in older remote-living Aboriginal Australians. In order to better understand the characteristics of pain in this population, this study was conducted to: (i) describe the prevalence, severity and sites of pain, as well as patterns of analgesic use; (ii) determine sociodemographic and clinical factors associated with pain; and, (iii) examine associations between pain, and depressive symptoms and disability. We hypothesised that pain would be common, but that analgesic use would be lower than in the general population, and that participants reporting pain would be more likely to experience clinically relevant depressive symptoms and to require assistance performing activities of daily living.

Methods

Study participants

The Kimberley Healthy Adults Project (KHAP) was developed to investigate the epidemiology of geriatric syndromes in remote-living older Aboriginal Australians. The initial wave of data collection occurred in 2004-2006. Aboriginal people living in six remote communities (Ardyaloon, Junjuwa, Looma, Mowanjum, Warmun, and Wirrimanu) representative of the 5 major language families of the Kimberley region were identified via semi-purposeful sampling with the assistance of local Aboriginal health and community services, and invited to participate. Participants were eligible if they were of Aboriginal or Torres Strait Islander descent, living in one of the identified communities for at least 6 months of the year, and aged ≥45 years. A random sample of one-third of eligible people from the town of Derby and residents living in residential care in participating locations were also approached. The age distribution of the sample was broadly representative of the general Australian population (9), and full details of the study protocol have been published previously (14). Between 2011-2013, follow-up of the initial sample was performed. Of the 363 people initially studied 109 (30.0%) had died and 70 (19.3%) could not be located or did not participate, leaving 184 people who were assessed at both time points. In addition, a further 156 people who reached the age of 45 years by the time of the second wave were invited to participate and 105 agreed to participate. Overall, of the 389 people invited to participate, 289 took part (response fraction: 74.3%), and 263 were included in the present study after excluding participants without a medication history and those who did not answer the questions about pain.

Study design

A culturally-appropriate questionnaire was administered by research assistants, with the assistance of interpreters if required, to participants and their family members/carers. The questionnaire, which was previously developed in consultation with community members to ensure linguistic and cultural relevance, recorded information about demographic and health-related details, including smoking and alcohol use, cognition (KICA-Cog), depression (KICA-Dep), falls, incontinence and function. As part of the questionnaire, an adapted

version of the Brief Pain Inventory short form (BPI), was administered (15). Following community consultation, the BPI was modified in language and scoring; although no validity study was undertaken for this adapted tool. The modified version of the BPI retained the sites of pain diagram and used a picture-enhanced (target sign) rating for pain severity with a shorter scale (0-5 vs. 0-10) compared to the original BPI (Supplementary Figure 1). Pain severity was categorised into mild (score 0-1), moderate (2-3) and severe (4-5).

Depressive symptoms were assessed by KICA-Dep, with a score ≥8 considered to be clinically significant and requiring further assessment. The KICA-Dep was adapted and validated for use in these communities (16). Disability was evaluated by counting the number of personal and/or instrumental activities of daily living (I/ADLs) that participants required assistance with and/or were unable to perform (total of 9 I/ADLs evaluated). Those requiring help with ≥2 I/ADLs were considered to have a disability. Medication data were sourced from the MMEx and Communicare electronic patient record systems, which at the time of the study were the systems used in the communities sampled. Further information about these systems is published elsewhere (17).

Ethics

Approval for this study was obtained from the participating communities; the Kimberley Aboriginal Medical Services Council; Kimberley Aged and Community Services; Kimberley Aboriginal Health Planning Forum Research Subcommittee; the Human Research Ethics Committee of the University of Western Australia; the WA Aboriginal Health Ethics Committee; and the Department of Health WA Human Research Ethics Committee. Written informed consent was obtained from all participants.

Statistics

Data analysis was undertaken using the Stata statistical package, version 11.2 (StataCorp, College Station, Texas). Sociodemographic and clinical data for participants are presented as mean or standard deviation (for continuous variables) or as the number and proportion of people who answered in the affirmative for a given variable. Pearson's Chi square test was

used to examine associations between categorical variables across groups. For continuous variables, the Kruskal-Wallis test was employed. Trend analysis was performed with Cuzick's non-parametric test for trend. Univariate binary logistic regression analyses were initially performed to investigate factors associated with pain (dichotomised to no pain or sometimes/all the time). All significant variables identified from this were then entered into a multivariate model, and non-significant variables were removed in a manual, backwards manner. Hosmer and Lemeshow's goodness-of-fit test was used to ensure appropriate model fit. P values <0.05 were considered statistically significant.

Results

Demographic, lifestyle and health characteristics of the sample, grouped by pain status are shown in Table 1. The mean age of the sample was 60.9±11.1 years (range: 45-91 years) and 55.5% were female. The prevalence of pain was high, with almost two-thirds of the sample (64.6%; n=170) reporting pain. Persistent pain was reported by 53 participants (20.2%). Nine participants (5.3%) had been experiencing pain for less than one week, 47 (27.6%) for weeks or months, and 114 (67.1%) for a year or more. Pain was reported to be the result of an injury or accident in almost half of affected participants (46.5%; n=79).

Prevalence of pain by age and sex

Pain was common in all age groups. About half of participants (51.9%; n=28) aged 60-69 years reported pain occurring intermittently. The prevalence of persistent pain (pain all the time) was generally similar across age groups, and by sex. Likewise, there was no statistically significant difference in overall pain prevalence by age (p=0.731) or sex (p=0.163).

Severity of pain

Among participants who reported pain (n=170), pain was mild in 22.9%, moderate in 35.9% and severe in 41.2%. As shown in Figure 1, pain appeared disproportionately severe (69.2%) in those aged ≥80 years who reported pain, however only 13 participants were in this group. Overall, pain severity did not differ significantly between age groups (p=0.429) or by sex (p=0.213). Pain prevented 79 participants (46.5%) from walking, 92 from doing work and/or housework (54.1%), 75 from sleeping (44.1%), and 67 from engaging in activities they enjoyed (39.4%).

Sites of pain

Table 2 shows the distributions of site-specific pain and multisite pain in participants who reported pain, stratified by sex. Documentation of sites of pain was available for 155 (91.2%) of the participants who reported pain. Knee and back pain were the most common sites of pain, each site in about a third of participants with pain. About half of participants with pain

(48.8%) reported a single site and approximately a quarter (22.4%) reported 3 or more sites of pain. Women were more likely than men to report multisite pain (p=0.001).

Pain and analgesic use

Analgesic use is summarised in Table 3. Less than half of participants with pain (41.2%; n=70) were prescribed at least one type of analgesic medication. Of the 104 people prescribed analgesic medication(s), 91 (87.5%) were on a single analgesic medication, while 13 (12.5%) were prescribed 2 or more analgesic medications. The most common analgesic medication used among participants with pain was paracetamol, followed by opioids then nonsteroidal anti-inflammatory drugs (NSAIDs). There was no significant association between analgesic use and pain (p=0.281). Of participants reporting pain, 63.5% (n=108) reported receiving some form of treatment, including physiotherapy. Almost half of these (47.2%; n=51) were taking an analgesic. Women (71.9%; n=64) were more likely than men (54.3%; n=44) to be receiving treatment for pain (p=0.038).

Cross-sectional factors associated with pain

In univariate analyses, poor vision, diabetes, hypertension, heart problems, kidney problems, and greater depressive symptoms were associated with pain (Table 4). However, after adjustment, only poor vision (OR=2.21; 95% CI 1.22-4.00), hypertension (OR=1.89; 95% CI 1.03-3.45), and heart problems remained associated (OR=2.05; 95% CI 1.01-4.14).

Pain and associations with depressive symptoms and disability

As shown in Table 1, participants who experienced pain more often had higher depression scores (p=0.001). However, pain was not significantly associated with clinically significant depression (17.2% in those without pain, compared with 22.9% in those with pain; p=0.529). Overall, 26.6% of the sample (n=70) met criteria for disability. Disability was present in about 1 in 3 participants (29.4%) with pain. Although disability appeared more common in those with pain sometimes or all the time, this did not reach statistical significance (p=0.165). However, as noted in Table 1, participants with more persistent pain were more likely to report poor mobility (p<0.001).

Discussion

In this study of remote-living Aboriginal Australians, we observed a high prevalence of pain which did not differ by age or sex. There was a trend for depression scores to be greater with more persistent pain, but pain was not associated with the presence of clinically relevant depressive symptoms, or disability.

Direct comparisons of pain prevalence estimates between studies are difficult due to heterogeneity of methods and variability in pain definitions, with many studies focusing on site-specific pain, chronic pain and conditions causing pain. Despite this, the overall prevalence of pain reported in this study (64.6%) is higher than in many other population estimates of pain (18). However, the prevalence of persistent pain (20.2%) was similar to that of the general Australian population aged over 15 years, which has been reported to be 17-20% (19, 20). Previous studies of chronic pain and musculoskeletal pain have suggested a similar or higher prevalence of pain among Indigenous or various minority ethnic/racial groups compared with the general population (10, 21-23). Although prevalence estimates vary considerably between studies, most demonstrate a typical peak prevalence in late middle age and then plateauing or declining with advancing age (24). In contrast, although a similar pattern was present in this sample, the overall prevalence of pain did not differ significantly by age and was high (>57%) in all age groups.

A large proportion of participants experienced moderate or severe pain in this study. The prevalence of severe pain (41.2% in those reporting pain, 26.6% overall) was substantially higher than the recorded figure of 13% by the Australian Bureau of Statistics for people aged ≥45 years, although we did not observe the same pattern of more severe pain with older age (25). In terms of site-specific pain, the more common sites of pain identified in this study (back, knee, shoulder) generally reflect other studies of musculoskeletal pain in Indigenous populations (10, 21, 26, 27).

Analgesic medication use in this study was substantially lower than in a study of Australian general practice patients with chronic pain (28). It is unclear whether this finding represents

appropriate or suboptimal prescribing for pain in this population. Although analgesic prescribing was not specifically assessed, a KHAP study of medication use in the same sample demonstrated evidence of both potentially inappropriate prescribing and under-prescribing (17). Another report indicated that Aboriginal people were twice as likely to be prescribed opioids by GP trainees compared to non-Aboriginal patients (29). While this may be related to higher symptom burden, it is also concerning given the opioid epidemic and divergence from chronic non-cancer pain guidelines (30). Aboriginal people are at risk of both inappropriate and under-prescribing potentially due to stereotypes about addiction susceptibility, access issues and complex interplay of factors such as communication, culture and expectations affecting pain reporting, assessment and management (4, 31, 32).

Some of the known risk factors associated with persistent pain such as sociodemographic factors, obesity, comorbid health conditions including diabetes and history of trauma or injury (33) were not found to be associated with pain in this study. The modest sample size, missing data for some variables such as BMI, and the high prevalence of chronic disease in older Aboriginal Australians may have minimised the ability to detect such associations. The factors associated with pain in this sample were poor vision, hypertension and heart problems. These identified factors are interesting as the association between cardiovascular disease and persistent pain is well recognised in the literature, however the exact nature of the relationship remains elusive (34, 35). Cardiovascular conditions like ischaemic heart disease, stroke, peripheral vascular disease and diabetes may contribute to various pain symptoms. Coexisting factors such as obesity and musculoskeletal conditions are also associated with pain (33). Both cardiovascular conditions and chronic pain are associated with mobility limitations, poorer exercise tolerance and disability (24, 33) which further increases adverse metabolic risk.

More persistent pain was associated with greater depressive symptoms, but overall the presence of pain was not associated with clinically significant depression or disability. The lack of association with depression and disability may be due to the relatively small sample size, missing data and how depression and disability were defined. Although not analysed

specifically in this study, other population studies have observed increased risk of disability with pain severity, frequency and multisite pain (24, 36). Given the complex interaction between pain, depression, frailty and disability (37-40), future longitudinal studies with larger sample sizes may be needed to clarify this relationship.

Limitations and strengths

To the authors' knowledge, this is the first study to specifically assess the prevalence, characteristics and associated factors of pain in remote-living older Aboriginal Australians. Most of the current literature on pain are conducted in Caucasian populations and those that relate to Australian Aboriginal populations focus mainly on musculoskeletal pain (10, 31). On this backdrop, this study adds to the limited evidence base and provides more comprehensive evaluation about pain prevalence and associated factors in remote-living older Aboriginal Australians. Other strengths include the high response fraction, engagement and support of the local Aboriginal health services and community and the use of culturally adapted tools and questionnaires for this population.

Several limitations need to be considered including the use of the culturally adapted version of the BPI. Although community consultation was undertaken in the development of this instrument, no formal validation study was performed prior to its use. While this study may be representative of Aboriginal people living in the Kimberley, the results may not be generalisable to other remote-living populations, or to urban populations. As the sample size was modest and some questionnaire data were incomplete or unavailable, this limited the ability to assess the distribution of pain sites across age groups, impact of pain severity/sites on mood and function, and non-pharmacological treatments for pain. We did not ask participants about arthritis, and so were unable to explore the burden of pain that may have been potentially associated with this condition. It is also possible that missing data for BMI and cognitive impairment may have affected our findings. Patient records included over-the-counter (OTC) medications, but we cannot be certain that all OTC products were reported. Additionally, causality cannot be inferred between pain and associated factors given the cross-sectional nature of the study.

Conclusion

This study found a high overall prevalence of pain and a similar prevalence of persistent pain in remote-living Aboriginal Australians aged ≥45 years compared to the non-Aboriginal Australian population. Poor vision, hypertension and heart problems were associated with pain, and more persistent pain was associated with higher depression scores, although the presence of pain was not associated with clinically relevant depressive symptoms. There were high levels of moderate and severe pain reported and relatively low use of analgesic medications in this population. Common sites of pain mirrored findings in other Aboriginal population studies and likely reflect prevalent musculoskeletal problems in this population. Further longitudinal studies are needed to examine the most pertinent pain risk factors, associations with other geriatric syndromes and the multidimensional impact of pain, in order to optimise the development and implementation of culturally appropriate management strategies. Additionally, these findings serve to inform and underscore the importance of training, appropriate medication prescribing, health care accessibility, resource allocation, service planning and research investment to address the burden of pain in remote Aboriginal communities.

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Tables

Table 1 Demographic, lifestyle, and health characteristics of the sample

Characteristic	Entire sample	By pain status		
		No pain	Sometimes	All the time
	(n=263) n (%) or mean±SD	(n=93) n (%) or mean±SD	(n=117) n (%) or mean±SD	(n=53) n (%) or mean±SD
Age (years)				
45-49	42 (16.0)	18 (19.4)	14 (12.0)	10 (18.9)
50-59	103 (39.2)	35 (37.6)	46 (39.3)	22 (41.5)
60-69	54 (20.5)	16 (17.2)	28 (23.9)	10 (18.9)
70-79	43 (16.3)	16 (17.2)	20 (17.1)	7 (13.2)
80+	21 (8.0)	8 (8.6)	9 (7.7)	4 (7.5)
Sex				
Male	117 (44.5)	36 (38.7)	61 (52.1)	20 (37.7)
Female	146 (55.5)	57 (61.3)	56 (47.9)	33 (62.3)
Education				
No formal education	64 (24.3)	26 (28.0)	30 (25.6)	8 (15.1)
Some formal schooling	199 (75.7)	67 (72.0)	87 (74.4)	45 (84.9)
Lifestyle				
Drink alcohol[1]	101 (38.4)	34 (36.6)	43 (36.8)	24 (45.3)
Smoke tobacco[1]	87 (33.1)	33 (35.5)	37 (31.6)	17 (32.1)
Chew tobacco[2]	82 (31.2)	31 (33.3)	35 (29.9)	16 (30.2)
BMI[42] (kg/m^2)	27.6±6.5	26.7±6.6	27.6±6.3	29.1±7.0
BMI category[42]				
Very underweight (<18)	11 (4.2)	5 (5.4)	4 (3.4)	2 (3.8)

Underweight (18-19.9)	12 (4.6)	5 (5.4)	5 (4.3)	2 (3.8)
Normal (20-24.9)	57 (21.7)	21 (22.6)	29 (24.8)	7 (13.2)
Overweight (25-29.9)	73 (27.8)	21 (22.6)	34 (29.1)	18 (34.0)
Obese (≥30)	68 (25.9)	21 (22.6)	29 (24.8)	18 (34.0)
Medical history and findings				
Poor vision[1]*†	119 (45.2)	31 (33.3)	57 (48.7)	31 (58.5)
Poor hearing[3]*†	50 (19.0)	15 (16.1)	16 (13.7)	19 (35.8)
Prior stroke[7]	30 (11.4)	6 (6.5)	14 (12.0)	10 (18.9)
Diabetes[16]	117 (44.5)	34 (36.6)	53 (45.3)	30 (56.6)
Hypertension[42]*†	103 (39.2)	26 (28.0)	48 (41.0)	29 (54.7)
Heart problems[15]*†	68 (25.9)	15 (16.1)	35 (29.9)	18 (34.0)
Kidney problems[21]*†	64 (24.3)	12 (12.9)	34 (29.1)	18 (34.0)
Urinary incontinence[9]	63 (24.0)	19 (20.4)	28 (23.9)	16 (30.2)
Poor mobility[4]*†	110 (41.8)	22 (23.7)	55 (47.0)	33 (62.3)
Recent fall[8]	58 (22.1)	16 (17.2)	24 (20.5)	18 (34.0)
Head injury with loss of consciousness[9]	85 (32.3)	25 (26.9)	42 (35.9)	18 (34.0)
Depressive symptoms (KICA-Dep score)[12]*†	4.8±5.3	3.6±4.1	4.6±5.0	6.9±7.0
Depression (KICA-Dep ≥8)	55 (20.9)	16 (17.2)	22 (18.8)	17 (32.1)
Cognitive impairment (KICA-Cog ≤35)[34]	60 (22.8)	24 (25.8)	28 (23.9)	8 (15.1)
Disability (assistance required with ≥2 I/ADLs)	70 (26.6)	20 (21.5)	34 (29.1)	16 (30.2)

Percentages calculated without excluding missing data (i.e., denominator is entire sample), and are shown for columns. Numerals in superscript represent number of people with missing data for that variable. Abbreviations: BMI = body mass index; I/ADLs = personal and/or instrumental activities of daily living; KICA-Dep = Kimberley Indigenous Cognitive

Assessment of Depression scale (higher KICA-Dep scores indicate greater depressive symptoms); KICA-Cog = Kimberley Indigenous Cognitive Assessment tool; SD = standard deviation. *denotes $p < 0.05$, † denotes $p < 0.05$ for trend.

Table 2 Prevalence of pain in specific anatomical locations

Pain site	All participants who reported pain	By sex	
		Male	Female
	(n=170)	(n=81)	(n=89)
	n (%)	n (%)	n (%)
Back	55 (32.4)	21 (25.9)	34 (38.2)
Knee	58 (34.1)	18 (22.2)	40 (44.9)
Shoulder	33 (19.4)	10 (12.3)	23 (25.8)
Hip	23 (13.5)	4 (4.9)	19 (21.3)
Arm	13 (7.6)	6 (7.4)	7 (7.9)
Hand	5 (2.9)	0 (0.0)	5 (5.6)
Wrist	5 (2.9)	4 (4.9)	1 (1.1)
Head	21 (12.4)	11 (13.6)	9 (10.1)
Neck	8 (4.7)	5 (6.2)	3 (3.4)
Chest	21 (12.4)	10 (12.3)	11 (12.4)
Stomach/abdomen	14 (8.2)	5 (6.2)	9 (10.1)
Leg (excluding knee)	25 (14.7)	15 (18.5)	10 (11.2)
Foot	19 (11.2)	7 (8.6)	12 (13.5)
Total number of sites			
0^	15 (8.8)	12 (14.8)	3 (3.4)
1	83 (48.8)	46 (56.8)	37 (41.6)
2	34 (20.0)	10 (12.3)	24 (27.0)
≥3	38 (22.4)	13 (16.0)	25 (28.1)

Percentages calculated without excluding missing data (i.e., denominator is participants who reported pain, n=170), and are shown for columns. ^ site(s) not marked on body diagram.

Table 3 Analgesic use in the entire sample, and by pain status

	Entire sample (n=263) n (%)	Pain status: No pain (n=93) n (%)	Pain status: Sometimes (n=117) n (%)	Pain status: All the time (n=53) n (%)
Analgesic use (any type)	104 (39.5)	34 (36.6)	44 (37.6)	26 (49.1)
Paracetamol*	87 (33.1)	30 (32.3)	36 (30.8)	21 (39.6)
NSAIDs	11 (4.2)	3 (3.2)	3 (2.6)	5 (9.4)
Opioids	21 (8.0)	6 (6.5)	8 (6.8)	7 (13.2)

Abbreviation: NSAIDs = nonsteroidal anti-inflammatory drugs (excluding aspirin).

*including combination products other than codeine.

Table 4 Logistic regression analyses showing factors associated with pain

Variable	Univariate OR (95% CI)	Multivariate OR (95% CI)
Age (years)	1.01 (0.98, 1.03)	—
Female sex	0.69 (0.41, 1.16)	—
Some formal schooling	1.35 (0.76, 2.41)	—
Drink alcohol	1.11 (0.66, 1.87)	—
Smoke tobacco	0.85 (0.50, 1.46)	—
Chew tobacco	0.85 (0.49, 1.46)	—
Poor vision	2.17 (1.28, 3.68)	2.21 (1.22, 4.00)
Poor hearing	1.35 (0.69, 2.63)	—
Prior stroke	2.41 (0.95, 6.14)	—
Diabetes	1.85 (1.09, 3.14)	NS
Hypertension	2.41 (1.36, 4.29)	1.89 (1.03, 3.45)
Heart problems	2.52 (1.32, 4.81)	2.05 (1.01, 4.14)
Kidney problems	3.08 (1.54, 6.18)	NS
Urinary incontinence	1.34 (0.73, 2.47)	—
Recent fall	1.61 (0.85, 3.07)	—
Head injury with loss of consciousness	1.54 (0.88, 2.69)	—
BMI (kg/m^2)	1.03 (0.99, 1.08)	—
KICA-Dep	1.08 (1.01, 1.15)	NS
KICA-Cog	1.01 (0.94, 1.08)	—

Note: Up to 263 participants included in cross-sectional analyses (216 participants included in the final multivariate model owing to missing data). Both KICA-Dep and KICA-Cog were analysed as continuous variables. Abbreviations: CI = confidence interval; NS = non-significant; OR = odds ratio; BMI = body mass index; KICA-Dep = Kimberley Indigenous

Cognitive Assessment of Depression scale; KICA-Cog = Kimberley Indigenous Cognitive Assessment tool.

Figure legends

Figure 1 Severity of pain, by age (A) and sex (B)

Supplementary Figure 1 Adapted version of the Brief Pain Inventory short form

Abstract

Background: Pain is a growing public health problem associated with significant health and functional implications. Limited data exist for Aboriginal Australians.

Aim: To describe the prevalence, severity and sites of pain, analgesic use, and associated factors including depression and disability, in remote-living Aboriginal Australians.

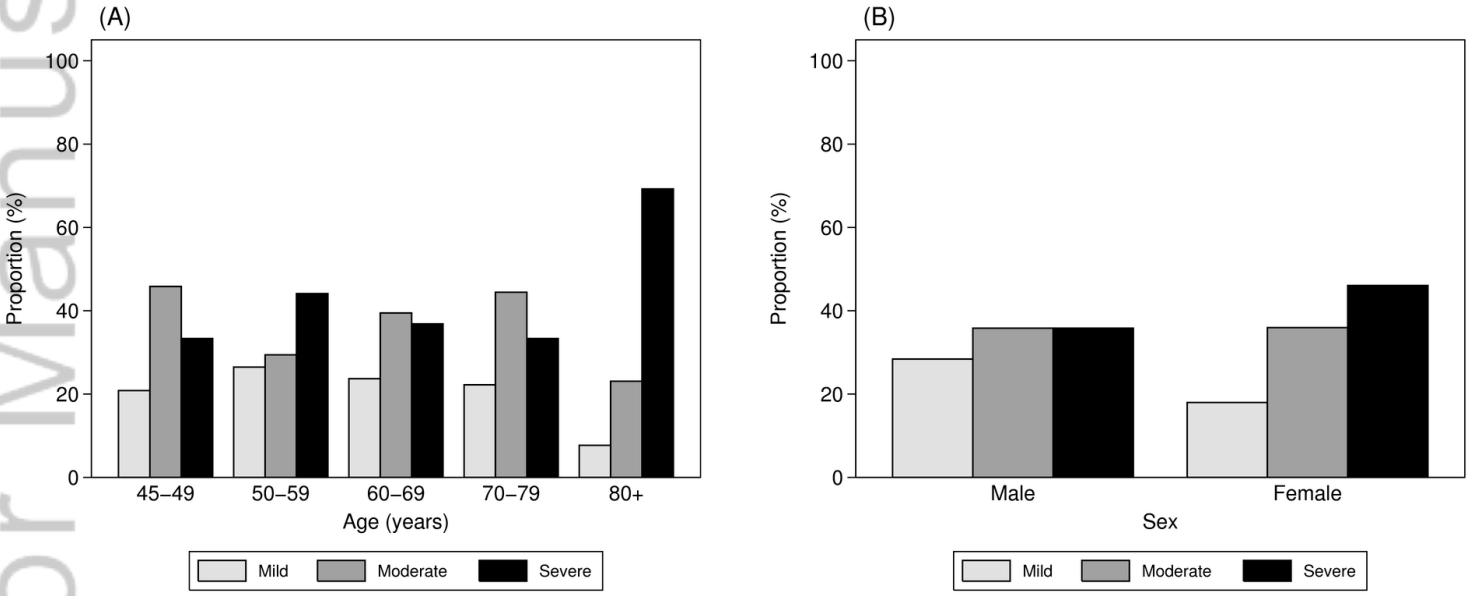
Methods: Cross-sectional study of 263 Aboriginal Australians aged ≥45 years from six remote Indigenous communities and the town of Derby in the Kimberley region of Western Australia between 2011-2013. Pain was assessed using a culturally adapted pain scale. Factors associated with pain were investigated with binary logistic regression.

Results: One hundred and seventy participants (64.6%) reported having pain and 53 (20.2%) reported persistent pain. Of those reporting pain, 61 (35.9%) rated it as moderate and 70 (41.2%) as severe. The most common sites of pain were back and knee, and 38 participants (22.4%) with pain indicated ≥3 sites of pain. Only 70 participants with pain (41.2%) were on some type of analgesic medication. After adjustment, poor vision (OR=2.21; 95% CI 1.22-4.00), hypertension (OR=1.89; 95% CI 1.03-3.45) and heart problems (OR=2.05; 95% CI 1.01-4.14) were associated with pain. Higher depression scores were associated with more persistent pain, but pain was not significantly associated with clinically relevant depressive symptoms, or requiring assistance with ≥2 personal and/or instrumental activities of daily living.

Conclusion: High levels of pain were reported, although the prevalence of persistent pain was comparable to the general population. Identifying risk factors, improving pain recognition and assessment, and evaluating culturally tailored management approaches should be a priority.

Key words

Pain, Aboriginal, Indigenous, ageing



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