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Hospital admission and associated factors among individuals presenting to healthcare facilities for low back pain in Ethiopia

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Abstract

Aim: The aim of this paper is to analyze hospital admission and associated factors following presentation to healthcare facilities for low back pain (LBP) in Ethiopia.

Methods: A population-based cross-sectional study was conducted between June and November 2018 in South-west Shewa zone of Oromia regional state. Data were collected by face-to-face interviews of adults (≥18 years) with self-reported LBP using a newly developed and validated instrument. All the statistical analyses of (n = 543) individuals with a 1-year history of presentation to healthcare facilities for LBP were performed using R version 3.5.1. The log-binomial regression model was fitted and prevalence ratios with 95% confidence intervals (CIs) were calculated to identify factors associated with hospitalization and the significance level was considered at the *P* value of ≤ .05.

Results: The proportion of hospital admissions following presentation to healthcare facilities for LBP was 14.4%, 95% CI 11.4-17.3, with an average length of stay (LOS) 7.4 days, 95% CI 6.4-8.8. The admission rate was 18.5%, 95% CI 13.4-23.3 in females and 11.4%, 95% CI 8.0-15.1 in males. Multiple factors, such as gender, age, living conditions, residential environment, alcohol consumption status, intensity of pain, and presence of additional spinal pain, were found to be independently associated with hospitalization for LBP.

Conclusions: The burden on the individuals and the Ethiopian healthcare system as a result of LBP is evident by the rate of hospital admissions. Further evidence on LBP case referral procedures is needed to allow health policy makers to develop appropriate management strategies capable of dealing with the increasing epidemiology of LBP.

KEYWORDS

associated factors, hospital admission, low back pain, presentation to healthcare facilities

1 | INTRODUCTION

Globally, low back pain (LBP) is one of the most prevalent public health issues[1,2] and results in significant healthcare expenditure.[3] The mean point prevalence of LBP among the general population has been estimated to be 11.9%[4] and the lifetime prevalence to range between 49% and 90%.[5] However, the prevalence of LBP varies significantly between countries as a function of socio-economic and demographic structures.[6,7] For example, Fujii and Matsudaira[8] found that the 1-month and lifetime prevalence of

LBP in the Japanese adult population was 36% and 83%, respectively, while Macfarlane et al[9] estimated the 1-month prevalence of LBP to be 28.5% among the UK population aged 25 years or more. Alternatively, a study among 40-79-year-old Koreans estimated the point prevalence of LBP to be 36.5% (26.2% in males and 43.9% in females).[10] This variation in the prevalence rates of LBP can also be attributed to several factors, including the difference in the type of prevalence being studied, case definitions, and the methods applied to investigate the prevalence of LBP.[4,11] Moreover, social norms, local healthcare approaches, and legislation were argued to be the most significant factors influencing the prevalence and associated impacts of LBP, including disability.[12]

The prevalence and consequences of LBP are also seen to be high in low- and middle-income countries, causing a great concern among communities, researchers, and public health program planners in these regions.[13-15] Pagare et al[16] indicated that the lifetime prevalence of LBP in the Indian general population was 75%, while a nationwide longitudinal study in Thailand showed that 30% of the study cohorts had a history of LBP in the years 2009 and 2013.[17] A recent study in Brazil also showed that the 1-week prevalence of LBP was 28.8% (39% in males and 60.9% in females).[18] In Africa, a recent systematic review of the literature showed that the point, annual, and lifetime prevalence of LBP in the region was 39%, 57%, and 47%, respectively.[19] Despite there being no population-based study in Ethiopia, a large epidemiological study undertaken with 190 593 participants from 43 low- and middle-income countries estimated the prevalence of LBP in Ethiopia to range between 13.7% and 25.3%.[20] The same authors also demonstrated that LBP is associated with increased mental health conditions, such as depression, anxiety and stress in low- and middle-income countries, including Ethiopia.

In high-income countries, such as the USA and Australia, the epidemiology of LBP is well studied and the data show that a significant proportion of LBP patients being admitted to hospital following presentation to emergency departments.[3,21] For example, the USA study showed that between 1998 and 2007, LBP accounted for a total of 183 151 individuals to be admitted to hospital across the country, of which 118 962 (65%) were admitted after presentation to emergency departments.[3] The study in Australia also indicated that the rate of hospital admission through emergency departments was 17.6%.[21] Evidence also demonstrates that the rate of hospital admission for LBP following presentation to emergency departments is increasing over time.[22] Population-based epidemiological studies also estimated that the impact of LBP, including a frequent and a large deal of ambulatory medical care visits and hospitalization will increase with time. For example, a 15-year time-series study in England demonstrated that hospitalization for LBP increased from 127.1 in 1999 to 216.3 in 2013 per 100 000 population,[23] representing a 1.7-fold rise over the course of 15 years or an annual rise of 7.6 per 100 000 population. Laffont et al[24] argued that LBP is the most common cause of pain in the adult population and the most common health problem prompting patients to seek ambulatory medical visits.

In low-income countries, such as those in Africa, there is no literature documenting the information about hospital admission for LBP and associated factors, particularly among the individuals presenting to healthcare facilities for the optimal management of pain. However, it would be important to note that the data on hospitalization for LBP can be seen as an indicator of a severe low back disorder.[25] A better understanding of the factors that significantly associate with hospital admission for LBP may also help clinicians to plan and implement evidence-based management of individual patients, particularly to appropriately address the factors while providing healthcare services. Furthermore, hospital admission is a significant contributor to the medical care costs of LBP, reflecting the resource-intense nature of LBP hospitalization.[22] It would, therefore, be important to analyze the implications of LBP measured as hospital admissions and associated factors following presentation to healthcare facilities for pain in Ethiopia, as one of the low-income countries.

2 | METHODS

2.1 | Study design and setting

A population-based cross-sectional study was conducted between June and November 2018 in South-west Shewa zone of Oromia regional state, Ethiopia.

2.2 | Study sample, sampling procedure, and data collection

The study sample was calculated using a single population proportion formula. With this formula, a total of 1981 adults (≥18 years) with LBP were calculated to be included in the study. The sampling procedure involved multiple stages. Firstly, 3 districts (1 urban and 2 rural) were selected from the 11 districts in South-west Shewa zone considering a recommendation in the literature.[26] Secondly, 2 kebeles (the smallest administrative unit in Ethiopia) from each of the 3 districts, totaling 6 kebeles, were randomly selected. Finally, the households within the selected kebeles were selected using a systematic random sampling procedure and individuals (≥18 years) with LBP were interviewed. In a household, only 1 individual with LBP was interviewed. In case there were 2 or more individuals with LBP in the selected household, 1 individual was selected with a lottery method, while the next household was visited in case there was no individual with LBP in the household. The total number of individuals interviewed from each kebele was proportional to the total number of households in the respective kebeles. In this way, a total of 1981 individuals with LBP were contacted to be interviewed, of whom 169 did not participate in the study and 1269 did not have a 1-year history of presentation to healthcare facilities to utilize health services for the optimal management of their LBP. Thus, the remaining 543 individuals who reported at least 1 presentation to any of the health institutions for their LBP in the past 1-year were included in the analysis of this paper (Figure 1). The

detailed procedure that includes sample size calculation, sampling technique, the identification of individuals with LBP, and data collection, is described elsewhere.[27]

2.3 | Data collection instrument

A newly developed and validated measurement instrument was used to collect the data. The instrument was composed of multiple items designed to collect various information, including socio-demographic characteristics, beliefs about LBP, pain-interrelated factors, sleeping problems/insomnia, depressive symptoms, health behaviors/lifestyle habits, pain-associated sequelae, and healthcare utilization including hospitalization for LBP. The instrument is proved to have an overall good level of content and factorial validity, internal consistency reliability, and temporal stability to measure the proposed information when applied to the same study population. The details of the psychometric properties of the instrument are described elsewhere.[28]

2.4 | Statistical analyses

The statistical analyses were performed using R version 3.5.1. Hospital admission was calculated with a 95% confidence interval (CI) to describe the proportion of individuals admitted to hospital following presentation to healthcare facilities for LBP. A log-binomial regression model was fitted and prevalence ratios with 95% CIs were calculated to identify factors associated with hospital admission and the significance level was considered at the *P* value of ≤ .05.

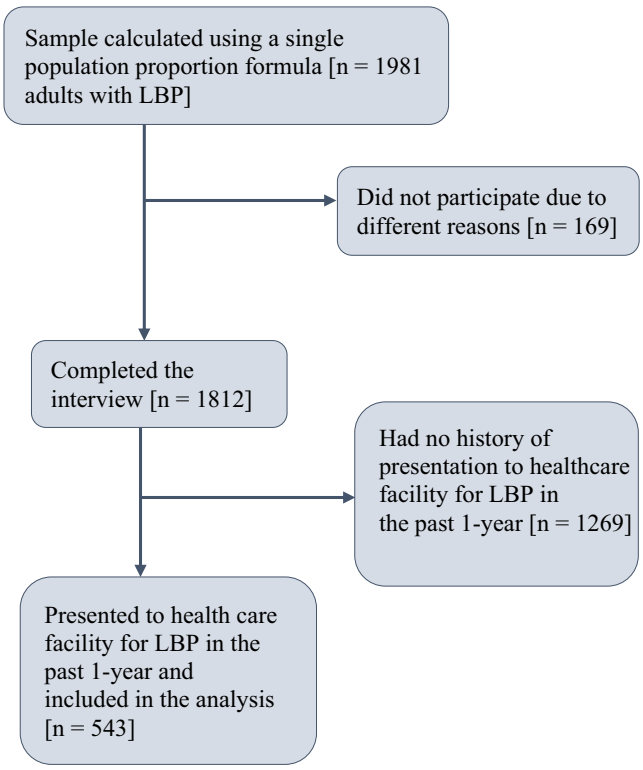

FIGURE 1 Flow diagram demonstrating sample included in the analysis

3 | RESULTS

3.1 | Socio-demographic profile of individuals presenting to healthcare facilities for LBP in the past year

Of the 543 individuals with a 1-year history of presentation to healthcare facilities for LBP, 316 (58.2%) were male and 205 (37.8%) had attended elementary school. The median age of these individuals was 43 years (interquartile range [IQR] 33-55 years). Nearly two-thirds (64.8%) were living in rural settings (Table 1).

3.2 | Health behaviors, beliefs about the pain, and pain-interrelated profile of individuals presenting to healthcare facilities for LBP in the past year

Health-compromising behaviors, such as smoking and khat (a plant with leaves and stem tips which are chewed for their stimulating effect) chewing were uncommon among the participants with a 1-year history of presentation to healthcare facilities for LBP; only 15 (2.7%) and 37 (6.8%), respectively, were smokers and khat chewers at the time of conducting the study. The majority, 350 (64.5%) of the individuals had negative beliefs about LBP (for example, believing that the pain is not curable and makes everything in life worse). Long-lasting LBP, that is, pain lasting 1-5 years and >5 years were observed in 210 (38.7%) and 88 (16.2%) people, respectively. A large impact of LBP, in terms of days off work, was reported by nearly two-thirds (64.3%) of the individuals (Table S1).

3.3 | Hospital admission following presentation to healthcare facilities for LBP

From a total of 543 individuals with a 1-year history of presentation to healthcare facilities for LBP, 78 (14.4%, 95% CI 11.4-17.3) were admitted to hospital. This accounts for 4.3%, 95% CI 3.4-5.3 of the total sample with LBP (n = 1812). The proportion of hospitalization was 42 (18.5%, 95% CI 13.4-23.3) in females and 36 (11.4%, 95% CI 8.0-15.1) in males. The average length of stay (LOS) in the hospital was 7.4 days, 95% CI 6.4-8.8 or median (IQR) 6.5 (3-10) days. Of those hospitalized patients, 21 (26.9%, 95% CI 17.8-37.8) were managed by a surgical procedure. This accounts for 3.9%, 95% CI 2.4-5.5 of the patients who presented to healthcare facilities and utilized health services for their LBP in the past year (n = 543). There was no statistically significant difference in the proportion of surgical interventions between genders (33.3% in females and 19.4% in males, Pearson Chi-square = 1.901, *P* = .168).

TABLE 1 Socio-demographic profile of individuals presenting to healthcare facilities for low back pain in the past year (n = 543)

	Total		Admitted to hospital		Not admitted to hospital	
Characteristics	**n**	**%**	**n**	**%**	**n**	**%**
Gender						
Male	316	58.2	36	11.4	280	88.6
Female	227	41.8	42	18.5	185	81.5
Age, y						
18-29	83	15.3	4	4.8	79	95.2
30-39	146	26.9	20	13.7	126	86.3
40-49	120	22.1	19	15.8	101	84.2
≥50	194	35.7	35	18.0	159	82.0
Educational level						
No formal education	86	15.8	14	16.3	72	83.7
Elementary (grades 1-8)	205	37.8	26	12.7	179	87.3
Secondary (grades 9-12)	100	18.4	8	8.0	92	92.0
Technical/ vocational certificate	31	5.7	2	6.5	29	93.5
Diploma	48	8.8	4	8.3	44	91.7
First degree or higher	73	13.5	24	32.9	49	67.1
Residence area						
Urban	191	35.2	41	21.5	150	78.5
Rural	352	64.8	37	10.5	315	89.5
Marital status						
Single	60	11.0	11	18.3	49	81.7
Married	411	75.7	57	13.9	354	86.1
Cohabited[a]	7	1.3	-	-	7	100
Separated	11	2.0	3	27.3	8	72.7
Divorced	13	2.4	-	-	13	100
Widowed	41	7.6	7	17.1	34	82.9
Living conditions						
Living with nuclear family	491	90.4	67	13.6	424	86.4
Living with non-nuclear family	13	2.4	1	7.7	12	92.3
Living alone	39	7.2	10	25.6	29	74.4

[a]Couples not officially married but living together as a wife/husband; n: number (frequency).

3.4 | Factors associated with hospital admission for LBP

Using the log-binomial regression analysis, socio-demographic factors, including gender, age, residential area, and living conditions, were identified to be independently associated with hospitalization. When adjusted for age, the prevalence ratio of hospitalization was higher in females than males (adjusted prevalence ratio [APR] =1.81, 95% CI 1.20-2.75). Similarly, on adjustment for gender, there was a nonlinear dose-dependent association between age groups and hospitalization (test for trend P = .009). Thus, as age group increased from 18-29 to 30-39 to 40-49 to ≥50 years, the prevalence ratio for hospitalization increased correspondingly (30-39 years of age, APR = 3.00, 95% CI 1.19-10.02; 40-49 years of age, APR = 3.50, 95% CI 1.38-11.71; ≥50 years of age, APR = 4.32, 95% CI 1.80-14.12). When compared with the urban residents, the rural residents were 45% less likely to be hospitalized (APR = 0.55, 95% CI 0.34-0.90). Despite no statistically significant difference in the history of hospitalization between participants living with their nuclear family and non-nuclear family, participants living alone were 2.54 times more likely to be hospitalized than participants living with their nuclear family (APR = 2.54, 95% CI 1.34-4.15). Educational level and marital status of the individuals were not statistically associated with hospitalization. From a list of health-compromising behaviors, such as smoking, alcohol consumption, and khat chewing, only alcohol consumption status was associated with hospital admission. Compared with current alcohol consumers, the history of reporting hospital admission was 64% (APR = 0.36, 95% CI 0.18-0.67) and 42% (APR = 0.58, 95% CI 0.37-0.91) lower in former consumers and those who never consumed alcohol, respectively (Table 2).

Intensity of pain was strongly associated with hospitalization. Compared with individuals with mild pain, those individuals with moderate and severe pain, respectively, were 2.46 (APR = 2.46, 95% CI 1.15-5.52) and 8.84 (APR = 8.84, 95% CI 4.82-18.13) times more likely to be admitted to hospital. Presence of additional spinal pain was also statistically associated with hospitalization. Individuals who had additional spinal pain were 1.46 times more likely to report a history of hospital admission when compared with individuals who had no additional spinal pain (APR = 1.46, 95% CI 1.01-2.13). In the unadjusted log-binomial regression model, pain spreading down the leg(s) was also associated with a higher history of hospital admission (unadjusted PR = 2.46, 95% CI 1.57-3.70). However, on adjustment for intensity of pain, there was no statistically significant difference in the history of hospitalization across pain spreading and not spreading down the leg(s). Self-reported general health, depressive symptoms, and insomnia were also not associated statistically with hospitalization for LBP (Table 3).

4 | DISCUSSION

4.1 | Hospital admission for LBP

At the societal level, the worldwide high prevalence of LBP and associated socio-economic impact[29] suggest that LBP requires immediate attention from researchers, policy makers, and healthcare funders.[24,30] Hospitalization for LBP reflects the severe effects of

TABLE 2 Socio-demographic factors and health behaviors associated with hospital admission for low back pain

Factors	PR (95% CI)	*P* value	APR (95% CI)	*P* value
Gender				
Male[a]				
Female	1.62 (1.08-2.46)	.021	1.81 (1.20-2.75)	.004
Age, y				
18-29[a]				
30-39	2.84 (1.12-9.53)	.049	3.00 (1.19-10.02)	.038
40-49	3.29 (1.29-11.03)	.025	3.50 (1.38-11.71)	.018
≥50	3.74 (1.56-12.24)	.010	4.32 (1.80-14.12)	.004
Educational level				
No formal education[a]				
Elementary (grade 1-8)	0.78 (0.44-1.46)	.414	0.84 (0.47-1.57)	.556
Secondary (grade 9-12)	0.49 (0.21-1.09)	.089	0.46 (0.19-1.02)	.061
Technical/vocational certificate	0.40 (0.06-1.31)	.203	0.31 (0.05-1.04)	.120
Diploma	0.51 (0.15-1.33)	.213	0.44 (0.13-1.15)	.127
First degree or higher	2.02 (1.15-3.73)	.018	1.45 (0.79-2.81)	.249
Residence				
Urban[a]				
Rural	0.49 (0.32-0.74)	<.001	0.55 (0.34-0.90)	.017
Living with				
Nuclear family[a]				
Non-nuclear family	0.56 (0.03-2.23)	.554	0.87 (0.05-3.31)	.878
Alone	1.88 (0.98-3.16)	.033	2.54 (1.34-4.15)	<.001
Smoking status				
Current smoker[a]				
Former smoker	0.65 (0.24-2.16)	.425	0.51 (0.18-1.89)	.233
Never smoked	0.51 (0.25-1.52)	.133	0.43 (0.21-1.42)	.066
Alcohol consumption status				
Current consumer[a]				
Former consumer	0.37 (0.19-0.68)	.003	0.36 (0.18-0.67)	.002
Never consumed	0.58 (0.37-0.90)	.014	0.58 (0.37-0.91)	.017
Khat chewing status				
Current chewer[a]				
Former chewer	1.35 (0.44-4.29)	.594	2.14 (0.63-7.52)	.221
Never chewed	1.05 (0.51-2.85)	.913	1.95 (0.81-5.68)	.162

Abbreviations: APR, adjusted prevalence ratio; in the models to compute the APR for educational level and residence, the respective variables were adjusted for each other; in the models to compute the APR for smoking, alcohol consumption, and khat chewing, the respective variables were adjusted for one another; PR, unadjusted prevalence ratio; the model to compute the APR for age was adjusted for gender; the models to compute the APR for gender and living conditions were adjusted for age.

[a]Reference category.

pain and suffering for the patient.[25] Mattila et al[31] argued that hospitalization for LBP is a process beginning with the individual's perception of pain and severely reduced function of the back. However, the history of hospitalization and associated factors among individuals presenting to healthcare facilities for LBP have not been well examined, particularly in low- and middle-income countries where the epidemiology and associated burden of LBP is estimated to increase at a higher rate in the coming years. The present study, which investigated hospital admission and associated factors following presentation to healthcare facilities for LBP in Ethiopia, is believed to be the first of its kind in the country.

In this study, 14.4% of individuals presenting to healthcare facilities for LBP in the past year were admitted to hospital, with an average median (IQR) LOS 6.5 (3-10) days. This demonstrates that LBP is a substantial public health problem posing a significant impact in view of hospitalization and associated expenses. A comparable finding was observed in an

TABLE 3 Beliefs about the pain and pain-interrelated factors associated with hospital admission for low back pain

Factors	PR (95% CI)	*P* value	APR (95% CI)	*P* value
Beliefs about LBP				
Positive beliefs[a]				
Negative beliefs	1.10 (0.72-1.74)	.660	1.16 (0.79-1.75)	.468
Pain spreading down the leg(s)				
No[a]				
Yes	2.46 (1.57-3.70)	<.001	1.34 (0.89-1.95)	.145
Pain intensity				
Mild[a]				
Moderate	2.74 (1.28-6.16)	.011	2.46 (1.15-5.52)	.023
Severe	10.56 (5.84-21.45)	<.001	8.84 (4.82-18.13)	<.001
Presence of additional spinal pain				
No[a]				
Yes	1.40 (0.93-2.13)	.112	1.46 (1.01-2.13)	.043
Self-rated health status in the past year				
Excellent[a]				
Very good	0.47 (0.16-1.97)	.219	0.59 (0.23-2.29)	.348
Good	1.24 (0.50-4.84)	.702	1.26 (0.58-4.59)	.655
Fair	1.84 (0.66-7.52)	.305	1.32 (0.54-4.98)	.612
Poor	3.48 (1.26-14.08)	.033	1.72 (0.71-6.48)	.310
Depressive symptoms				
Normal[a]				
Borderline case	1.00 (0.58-1.64)	.990	0.93 (0.57-1.46)	.768
Case	2.10 (1.27-3.36)	.003	1.09 (0.68-1.68)	.700
Insomnia				
No[a]				
Yes	1.38 (0.90-2.07)	.134	1.40 (0.96-2.01)	.071

Abbreviations: APR, adjusted prevalence ratio; LBP, low back pain; PR, unadjusted prevalence ratio; the models to compute the APR for each variable were adjusted for intensity of pain, while the model to compute the ARP for intensity of pain was adjusted for pain spreading down the leg(s) and presence of additional spinal pain.

[a]Reference category.

Australian study,[21] which indicated that 17.6% of individuals with LBP, who presented to emergency departments, were admitted to hospital for 6 (3-12) days overall median (IQR) LOS. Alternatively, a study in the USA showed that only 4.5% of LBP patients presenting to emergency departments were admitted to hospital,[32] which is lower than the findings of the current study. This observed discrepancy in the rate of hospital admission following presentation to healthcare facilities for LBP across countries could be attributed to the variations in the healthcare and referral systems between countries. This difference could also be attributed to multiple other factors as discussed elsewhere.[33]

4.2 | Surgical and non-surgical management of LBP patients admitted to hospital

In this study, 21 (26.9%) of the hospitalized LBP patients who received surgical interventions made only 3.9% of the total LBP patients who presented to healthcare facilities in the past year. This finding fits with the argument that because of the side effects of surgical interventions of LBP, conservative treatment is often preferable to a surgical procedure.[34] In addition, Olafsson et al[35] found that in treatment pathways, most LBP patients receive conservative care, while only a few utilize high-cost care such as surgery. It should be noted that even the small proportion of patients who underwent surgical interventions, account for a large portion of LBP healthcare costs.[36] For example, in a study investigating expenditures and healthcare utilization among adults with newly diagnosed low back and lower extremity pain, only 1.2% underwent a surgical procedure, but accounted for 29.3% of the total 12-month healthcare costs associated with the pain.[37] This may reflect more severe symptoms among individuals with LBP eventually undergoing operative treatment, which may not rapidly resolve.[38]

In this study, the profile of surgical interventions was observed to be similar in males and females. This finding is in keeping with another study which reported that the proportion of surgical

procedures performed for the management of LBP patients was similar between the genders.[24]

4.3 | Factors associated with hospital admission for LBP

The rate of hospital admission was significantly higher in females than males, which is concordant with the findings of previous studies in Argentina[24] and England.[23] This gender-based differential rate of hospitalization for LBP may reflect the difference between the low back morbidity profile of both genders, as argued in the literature.[4,39] The participants' ages were also associated significantly with hospital admission for LBP. There was a nonlinear increase in the prevalence ratio of hospitalization with an increasing age cohort (test for trend $P = .009$). This finding is comparable with another study that observed a greater increase in the annual rate of hospital admission for LBP in older age groups.[23] This increase in the rate of hospitalization with increasing age supports the argument that the epidemiology of LBP, including hospitalization and healthcare resource utilization, is a function of age.[11,40,41] In addition, Nunn et al[42] argued that more comorbidities often require more medical attention with increasing age.

In a previous study,[27] the prevalence ratio of healthcare utilization for LBP was higher in participants living in rural settings than those living in urban settings. The same study showed that a significantly greater number of rural than urban residents were presenting to the lower levels of the Ethiopian healthcare system to deal with their pain. In contrast, a greater proportion of urban than rural residents were found to be presented to the middle and upper levels of the healthcare system. In this study, the prevalence ratio of hospital admission for LBP was 45% lower in the rural residents than the urban residents. This may not reflect the lower burden of LBP in the rural population compared with the urban population. Rather it shows that hospital admissions occur at the middle and upper levels of the Ethiopian healthcare system, where more urban than rural populations were found to be presented to get health services for their pain. This variation in point of healthcare utilization was suggested to be a product of the difference in socio-economic status between the rural and the urban populations.[27] In addition, the availability of health services also explains the observed difference in point of healthcare utilization for LBP. However, in settings with relatively improved access to the healthcare systems, such as Poland, it has been shown that a significantly greater proportion of rural than urban residents were hospitalized for LBP.[43]

A previous study documented that living in a non-nuclear family increased the hazard of hospitalization for LBP among adolescents.[31] In this study, a statistically significant difference was not observed between participants living with their nuclear and non-nuclear families. However, the rate of hospitalization was 2.54 times higher in individuals living alone than those living with their nuclear family. This could be because people living alone may suffer loneliness, which has been shown to be associated with increased ill-health,[44] which in turn exacerbates the effects of the pain and leads to hospital admission.

Previous studies demonstrated that alcohol consumption,[31] smoking, and being overweight,[45] were associated with an increased risk of hospitalization for LBP. These findings partly match the current study which showed that being currently non-consumer of alcohol reduced the prevalence ratio of hospital admission, while smoking and khat chewing status were not associated with hospitalization for LBP. In general, these health-compromising behaviors should not be overlooked as evidence is also mounting that they are associated with increased risk of LBP.[45-47]

In this study, a strong association was observed between intensity of pain and hospitalization. Increased intensity of pain was associated with a significantly higher profile of hospital admission. This finding matches with another study which showed that pain was the major reason for hospitalization in workers with herniated lumbar disks.[25] Because a higher intensity of pain adversely affects general health, which causes hospital admission, a comprehensive plan is needed to address it while providing health services to individuals with LBP. Borys et al[48] suggested that multimodal therapy is effective for the management of intensity of pain and depression among patients with LBP. Presence of additional spinal pain was also associated with the higher rate of hospitalization. This could be explained by the fact that further spinal pain may worsen general health status with subsequent hospital admission. For example, Konstantinou et al[49] showed that patients with both low back and leg pain experience worse outcomes than those with only LBP. In the current study, despite pain spreading down the leg(s) being found to be associated with a 2.46-fold increased rate of hospital admission in the unadjusted log-binomial regression model, the association did not remain statistically significant on adjustment for intensity of pain. This finding does not fit a previous longitudinal study which documented that radiating LBP down to the leg(s) was found to increase the risk of hospitalization 3-fold.[50] The inconsistency of the findings of these 2 studies could be linked to the difference in the reference population. While the reference cohort in this study was individuals with LBP whose pain did not spread down the leg(s), the previous study used LBP-free individuals as a reference cohort.

4.4 | Strengths and limitations of the study

The strength of this study lies in its relatively large sample size, which is highly likely to reflect the true burden of LBP on the individual patients and healthcare system in terms of hospitalization and associated consequences. Nonetheless, the directionality of the associations between the reported covariates and hospitalization for LBP could not be identified due to the cross-sectional nature of the study.

5 | CONCLUSIONS

This study demonstrated that 14.4% of individuals presenting to healthcare facilities for LBP in the past year reported a history of

hospitalization for the pain. This indicates the burden of LBP on the individual patients and the already overloaded Ethiopian healthcare system. A range of factors, such as gender, age, living conditions, residential environment, alcohol consumption status, intensity of pain, and comorbidity with additional spinal pain, were found to be independently associated with hospital admission following presentation to healthcare facilities for LBP.

Ineffective management approaches for LBP may lead to an increased burden of pain, and decreased motivation among healthcare providers, and non-compliance in the patients. Further research is, therefore, needed on LBP in relation to referral procedures in the Ethiopian healthcare system to inform health policy makers regarding appropriate management strategies capable of dealing with the increasing epidemiology of LBP.

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CONFLICT OF INTEREST

The authors declare they have no conflicts of interest.

ETHICS APPROVAL

Ethics approval for this study was obtained from the Human Research Ethics Committee (Tasmania) Network, ethics reference number H0017128. Approval for data collection was obtained from Oromia Regional State Health Bureau, South-west Shewa Zone Health Office, and health officials of the selected districts. Informed consent was also obtained from all study participants prior to their inclusion. Participation in the study was voluntary and confidentiality maintained at all times.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

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