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Research article

Prevalence of low back pain and associated factors among nurses working in public hospitals of Hawassa city, southern Ethiopia: A cross-sectional study

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ABSTRACT

Background: Low back pain is a prevalent musculoskeletal ailment that affects numerous individuals, particularly those in the workforce. Nurses, in particular, are highly susceptible to this condition. In developing countries, nurses may encounter physically demanding environments requiring them to lift or transfer patients or equipment without access to proper lifting aids. Such circumstances increase their chances of developing low back pain. Hence, it is crucial to determine the prevalence and risk factors of low back pain to assess the effect and suggest preventive measures.

Objective: This study aims to assess the prevalence of low back pain and associated factors among nurses working in public hospitals in Hawassa City, Sidama Region, Southern Ethiopia, 2021.

Methods: An institutional-based cross-sectional study was conducted from May 15 to Jun 15, 2021, among randomly selected 398 nurses working in public hospitals of Hawassa City, southern Ethiopia. Data were collected using a standard, modified Nordic Musculoskeletal assessment tool. The data was entered into EPI-Data version 4.6.0.2 and exported to STATA version 14.0 for analysis. A multivariable logistic regression model was used to identify factors associated with the prevalence of low back pain. Significance was considered at $p < 0.05$ with a 95 % confidence interval.

Results: The study was conducted among 391 nurses, giving a response rate of 98.2 %.The one-year prevalence of low back pain was 242(61.9 %) with (95 % CI: 57%–66 %). Being female [AOR 1.82; 95%CI (1.07–3.08)], body mass index ≥25 kg/m^2 [AOR 2.17; 95 %CI (1.24–3.79)], not getting assistance from coworkers [AOR 1.80; 95 % CI (1.07–3.02)] and not using of the assistive device were [AOR 1.77; 95 % CI (1.04–3.01)] were factors significantly associated with low back pain among nurses. **Conclusion**: Based on the findings of this study, a high proportion of nurses reported having low back pain among nurses in Hawassa public hospitals. The study suggests emphasizing the accessibility of assistive devices for patient care, having a balanced

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body weight, and working in collaboration among nurses to reduce the risk of low back pain among nurses.

1. Introduction

According to the 2017 Global Burden of Disease report, low back pain was a leading cause of years lived with disability (YLDs). The globally prevalent number of people with low back pain (LBP) was 577.0 million, with South Asia being the highest (96.3 million), as it will have a more overpowering impact on one's healthy life [1].

Low back pain is a widespread health problem and a well-known cause of disability in developed countries. According to the United States Burden of Disease, low back pain is the third leading cause of Disability-adjusted life Years (DALY), among other diseases and injuries. It is one of the top ten causes of DALY burden in the working age group [2]. In addition to this, it is the single leading cause of disability in 160 countries and the highest burden, with a prevalence of 568 million people [3,4].

LBP is a primary reason for morbidity among healthcare workers (HCWs); their nurses are the most affected[6, 7]. Nursing is a profession that is frequently exposed to the risks of low back pain. Nurses work to protect and improve health in cases of health problems for individuals and families. They also spend more time with patients by providing direct care for them when compared to other health care providers. Nurses face high workloads, burnout, stress, and demotivation at work, all of which expose them to LBP in various ways [5]. In their day-to-day work, nurses are exposed to activities that create favorable conditions for low back pain (LBP), such as lifting and transporting patients or equipment, twisting, bending, sustained posture, and repeated movements. They often perform such tasks in challenging environments, particularly in developing nations where lifting aids are not available or unattainable. This task vigorously affects the back, leading them to experience different musculoskeletal complaints. Therefore, the occurrence of LBP is higher in nurses than in other health professionals and the rest of society [4,6,7].

The Health and Safety Executive (HSE) reported that 2.8 million working days were missed in 2016/17, making it one of the leading occupational health problems that deserve attention due to lost productivity and employee absenteeism [4,8,9]. Furthermore, debilitating changes in the nurse's health affect patient care delivery and, subsequently, patients' health. It was reported that billions of dollars were expended yearly on the management of LBP, and the nursing shortage has been exacerbated by the burden of LBP and related disabilities. Therefore, recruitment and retention of nurses have become challenging [10,11].

It is estimated that up to 80 % of adults will experience low back pain at some point in their lives [1]. Nurses are at a higher risk for LBP due to their job's physical demands, with a prevalence rate ranging from 40 % to 97.9 % [12]. Studies in Ethiopia have shown that the prevalence of LBP among adults ranges from 38.1 % to 67.2 % [13,14]. The literature on the prevalence and associated factors of LBP among nurses is inconsistent and often conducted in developed countries. Additionally, studies from developing regions use different definitions, measurements, and classifications of LBP, making comparing and generalizing results challenging. To address this gap, this study uses standardized definitions and measurements to assess the prevalence of low back pain and associated factors among nurses working in public hospitals in Hawassa, Ethiopia.

2. Methods and materials

2.1. Study design, period, and setting

An Institution-based cross-sectional study was conducted from May 15 to Jun 15, 2021, in public hospitals in Hawassa City, Southern Ethiopia, Sidama region. Hawassa City is the capital of the Sidama region in southern Ethiopia. The city administration has an area of 157.2 sq. km, divided into eight sub-cities and 32 kebeles. Hawassa City has four public Hospitals: Hawassa University Comprehensive Specialized Hospital (HUCSH), Adare General Hospital, Motite Fura Hospital, and Hawela Tula Hospital. HUCSH has 400 beds and sees an average of 65,000 people per year. This teaching hospital has 341 healthcare workers and 462 nurses. Adare General Hospital is located in the city center and has 185 nurses. Motite Fura Hospital and Hawela Tula primary hospitals have 15 and 50 nurses, respectively.

2.2. Sample size determination and sampling procedure

The sample size for the study was calculated using a single population proportion based on the following assumptions: 95 % confidence level (significance level at $\alpha = 0.05$), 5 % margin of error, the proportion of low back pain found to be 38.1 % from the study done in Eastern Ethiopia [13], and by adding a 10 % non-response rate, the final sample size was 398.

This study involved the participation of nurses who work at four public hospitals. The sample size was proportionally distributed among the four hospitals using the proportional-to-size allocation. Study participants were then selected by simple random sampling with the lottery method after accessing the list of nurses fulfilling the inclusion criteria from each hospital's human resources department as a sampling frame.

2.3. Eligibility criteria

All nurses who worked in public hospitals in Hawassa City for 12 months or more during the study period were included; whereas

those who were pregnant, had a history of trauma, or had known intervertebral disc problems were excluded.

2.4. Data collection tool and procedure

Data were collected using a self-administered semi-structured questionnaire adapted from the standard Nordic Musculoskeletal Questionnaire [15], and related literature with slight modifications in line with the objectives was used [16,17]. The questionnaires had six sections: Socio-demographic characteristics contained eight questions incorporating age, sex, BMI(weight divided by height square), marital status, monthly income, working unit, and educational status; behavioral characteristics of participant contains six questions, their experience with LBP during the last 12 months contained eleven questions, occupational and ergonomic factors contain two questions, and environmental factors contain six questions. The last section, psychosocial factors, includes nineteen questions covering sleep disturbance (yes/no), job satisfaction, and job stress.

Job satisfaction was assessed using a 10-item generic job satisfaction questionnaire with 5 Likert scale responses (very dissatisfied = 1, Dissatisfied = 2, neutral = 3, satisfied = 4, and very satisfied = 5). The workers are classified into two categories: satisfied (32–50) and unsatisfied (10–31). Job stress was assessed by a workplace stress scale containing nine items, each rated by a Likert scale as 1 (never), 2(rarely), 3(sometimes),4(often),5(very often), and a nurse who scores mean and above ($\geq$ 21) of workplace stress scale considered as having job stress. The reliability of the questionnaires has been investigated in previous studies done in Ethiopia with Cronbach's alpha = 0.775 [18]. Five trained BSc degree nursing students collected data; one MSc student in adult nursing was a supervisor. The completed questionnaires were collected daily to be checked for consistency and completeness by the supervisor and the principal investigator.

2.5. Data analysis

After the data was edited, coded, and entered into the Epi Data 4.6.0.2 version, it was exported to STATA 14.0 for analysis. Descriptive statistic was used to summarize data. Binary logistic regression was used to check for the association between the outcome variable and the independent variables. Variables that yield a p-value of <0.25 in bivariable were considered candidates for multivariable logistic regression analysis. Multivariable logistic regression assessed the association between the dependent variable and independent variables. Variables with a p-value of <0.05 were considered statistically significant and presented as an adjusted odds ratio (AOR) with 95 % CI in the multivariable logistic regression. The Goodness of fit for the model was checked by Hosmer and Lemeshow (p-value >0.05). Multi-collinearity was checked by the variable inflation factor (VIF); the maximum value was 3.

2.6. Operational definitions

Low Back Pain (LBP): pain or discomfort in the spinal area between the lower costal margins and gluteal folds with or without

Table 1
Socio-demographic Characteristics of nurses at Public Hospitals in Hawassa, Sidama region, Ethiopia, 2021.

Variables (N = 391)		Frequency	Percent (%)
Age	20–29	210	**53.7**
	30–39	148	**37.9**
	≥40	33	**8.4**
Sex	Male	170	**43.5**
	Female	221	**56.5**
BMI	<18.5	13	**3.3**
	18.5–24.9	237	**60.6**
	25–29.9	112	**28.6**
	≥30	29	**7.4**
Marital status	Single	151	**38.6**
	Married	214	**54.7**
	Divorced	19	**4.9**
	Widowed	7	**1.8**
Working unit	Medical ward	72	**18.4**
	Surgical ward	47	**12.0**
	Pediatrics Ward	67	**17.1**
	OPD	56	**14.3**
	ICU	43	**11.0**
	Emergency unit	64	**16.4**
	Other	42	**10.7**
Educational status	Diploma	56	**14.3**
	Degree	306	**78.3**
	Masters	29	**7.4**
Monthly salary in ETB	≤4500	15	**3.8**
	>4500	376	**96.2**

*Other in working unit: Neurology ward, ophthalmology ward, psychiatric ward, Operation room theater. BMI, body mass index; OPD, outpatient department; ICU, intensive care unit; ETB, Ethiopia birr.

radiation to the leg below the knee for at least one day during the past 12 months [19].

Stressed worker: A workplace stress scale score of 21 or above [20].

Job-satisfied worker: The generic job satisfaction scale score is 32 or above [21].

2.7. Data quality assurance

A properly designed data collection tool was designed to ensure the quality of the data. The data collection tool was first designed in English, translated into Amharic, and back to English by language experts to check its consistency. The questionnaire was also given to the advisors for critique and final approval. Data collectors were trained before data collection. Before leaving each study participant, each data collector checked the questionnaires for completeness. The supervisor and the principal investigator checked data completeness, accuracy, and clarity daily. Before data collection, 20 participants (5 %) underwent a pretest at Yirgalem Hospital. Questions were revised based on pretest analysis to ensure clarity without altering their intended meaning. We ensured the reliability of the variables by using Cronbach's alpha. The internal consistency for NMQ (Cronbach's alpha = 0.726), Worker job stress (Cronbach's alpha = 0.713), and worker job satisfaction (Cronbach's alpha = 0.747). To control the data quality for analysis, editing and cleaning the data before entry was done. STROBE cross-sectional reporting guidelines [22] were used to ensure the quality of the write-up.

3. Results

3.1. Socio-demographic characteristics of participants

A total of 391 respondents participated in this study, giving a response rate of 98.2 %. The mean age of the respondents was 30.7 (±6.7) years. Two hundred twenty-one were (56.5 %) females. Regarding marital status, 214 (54.7 %) were married. Of the total respondents, more than three-fourths of the participants, 306 (78.2 %), were first-degree holders by their educational status (Table 1).

3.2. Behavioral factors of nurses working in public hospitals in Hawassa city

More than half of the nurses, 250 (63.9 %), had more than five years of nursing experience. Regarding work shifts, 303 (77.5 %) reported working day and night. Of 391 participants, 225 (57.5 %) had taken workplace health and safety training. This study also showed that 80 (20.5 %) participants had never done an exercise program. Most of the participants, 302 (77.2 %), have never smoked cigarettes, and 257 (65.7 %) have never drank alcohol.

3.3. Prevalence of lower back pain

Of the total respondents, 242 (61.9 %) (95 % CI: 57%–66 %) of them experienced low back pain during the last 12 months. Over the past seven days, 151 (62.4 %) of individuals have reported experiencing low back pain. Nearly one-third (31.8 %) of the 77

Table 2
Low Back Pain Experience among Nurses Working at Hawassa Public Hospitals, Sidama region, Ethiopia, 2021.

Variables (N = 242)		Frequency	Percent (%)
Duration of low back pain	1–7 days	106	43.8
	8–30 days	52	21.5
	More than 30 days, but not every day	54	22.3
	Every day	30	12.4
Visited a physician or physiotherapist	Yes	97	40.1
	No	145	59.9
Hospitalization due to Low back pain	Yes	73	30.2
	No	169	69.8
Intention to change the profession	Yes	106	43.8
	No	136	56.2
Frequency of low back pain	Infrequent (<3 days/weak)	121	50.00
	Frequent (3–5 days/weak)	94	38.8
	Daily pain (6–7 days/weak)	27	11.2
Pain radiates to Extremities and other body parts	Yes	136	56.2
	No	106	43.8
Low back pain in the last 7 days	Yes	151	62.4
	No	91	37.6
History of low back pain before working as a nurse	Yes	77	31.8
	No	165	68.2
Daily living and leisure activities affected due to Low Back Pain	Yes	160	66.1
	No	82	33.9
Absent from work due to low back pain	Yes	137	56.6
	No	105	43.4

participants had a history of low back pain (before working as a nurse). This study showed that 106 (43.8 %) and 30 (12.4 %) nurses reported that the duration of low back pain was between 1 and 7 days and every day, respectively. Of those participants who experienced LBP, 136 (56.20 %) complained that their pain radiated to their lower extremities and other body parts. Out of those who experienced low back pain, 97 (40.1 %) of them visited a physician or physiotherapist, 73 (30.2 %) were hospitalized, and 137 (56.6 %) were absent from work due to low back pain. In this study, 160 (66.1 %) of the respondents reported that their daily living and leisure activities were affected, and 106 (43.80 %) intended to change their profession due to LBP (Table 2).

3.4. Work-related and ergonomic risk factors for low back pain

About 242 (61.9 %) of the respondents experienced LBP; of them, 165 (68.2 %) believed that their low back pain was due to their profession, while 77 (31.8 %) responded that it was not related to their profession. As the cause or aggravating factor for low back pain among nurses, most respondents believed that frequent bending activity 166 (68.6 %) was the primary factor contributing to their LBP occurrence. More than half of the respondents, 159 (65.7 %), believed that prolonged standing was one cause and aggravating factor of their lower back pain. Other participants complained that the following: positioning the patient on bed 151 (62.4 %), lifting or transferring the patient 138 (57.%), working when physically fatigued 137 (56.6 %), Performing repetitive tasks 86 (52.1 %), sustained sitting 111 (45.9 %) and pushing or pulling 111 (45.9 %) were causes and aggravating factors for the pain in their lower back.

Even if of small proportions, according to the respondents, heavy lifting 106 (43.8 %), working in an awkward position 99 (40.9 %), giving medication 93 (38.4 %), and working away from your body 86 (35.5 %) also contribute to their low back occurrence (Fig. 1).

3.5. Environmental factors of nurses working in Hawassa public hospitals

More than half of the participants, 211 (54 %), reported they do not have a comfortable working environment. Of those, 146 (69.2 %) reported that the work environment affects low back pain. The study showed that 177 (45.3 %) nurses ask for assistance when performing patient-handling activities, and 219 (56) nurses use assistive devices. More than half of the participants, 217 (55.5 %), reported having an adequate rest interval. Two hundred (51.2 %) reported having a shortage of staff.

3.6. Psychosocial factors of low back pain

Regarding job satisfaction, 280 (71.6 %) explained that they were satisfied with their jobs, while the remaining nurses clarified that they were not. More than half of the respondents, 218 (55.8 %) indicated job-related stress. Among the participants, 214 (54.7 %) experienced sleep disturbances related to their job.

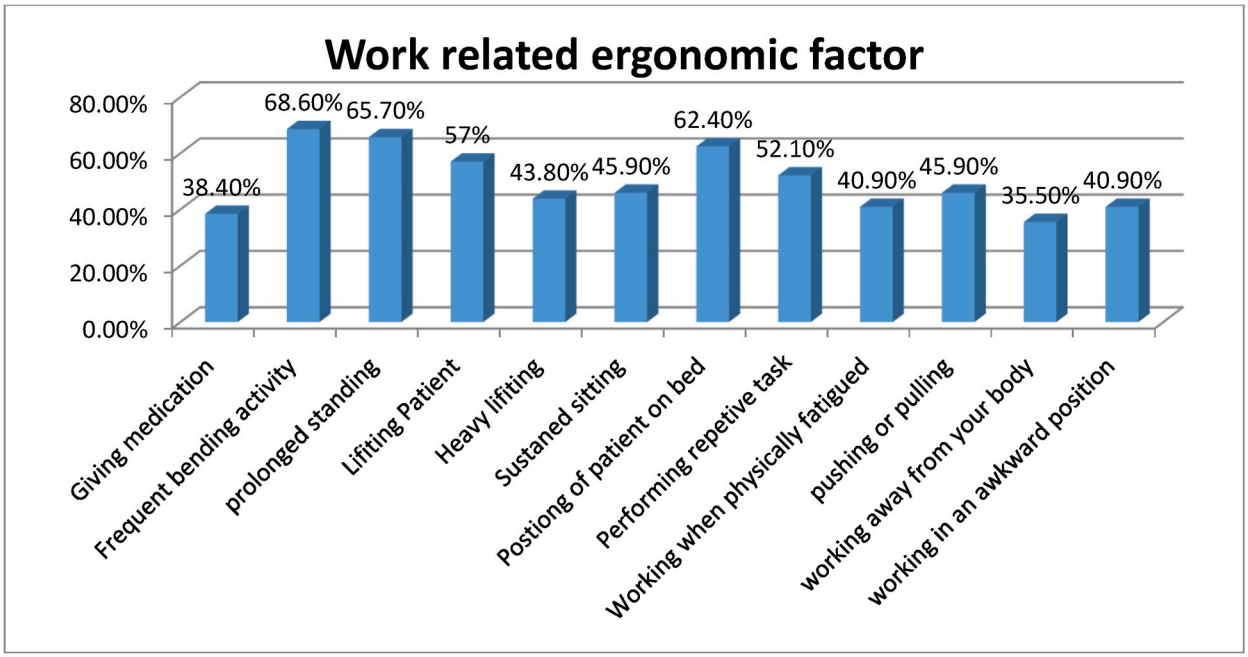

Fig. 1. Work-related ergonomic factors of low back pain among nurses working in public hospitals in Hawassa City, Sidama region, southern Ethiopia, 2021.

3.7. Factors associated with low back pain

In the bivariate logistic regression analysis, socio-demographic variables such as age, sex, BMI, marital status, working unit, educational status, and monthly income were associated with LBP. Behavioral factors of the respondents, such as years of experience, health safety training, a physical exercise program, smoking status, and alcohol drinking, were associated with LBP. From work-related ergonomic risk factors, work environment risk factors, and psychosocial risk factors, those that had an association with the outcome variable were work environment status, assistance from coworkers, using assistive devices, shortage of staff, sleep disturbance, and job stress and job satisfaction, which were associated with a P-value <0.25.

Multivariable regression analysis showed that sex (female), BMI (≥25kg/m2), not getting assistance from coworkers, and not using an assistive device showed significant associations with the outcome variable. Accordingly, having all variables controlled, the odds of experiencing low back pain were 1.82 times more likely among females than males [AOR 1.82; 95 % CI (1.07–3.08)]. The participants who had a BMI ≥25kg/m2 were 2.17 times more likely to have low back pain compared to those with a BMI of 18.5–24.9 kg/m2 [AOR 2.17; 95 % CI (1.24–3.79)].

Nurses who did not receive assistance from coworkers were 1.80 times more likely to develop low back pain compared to those who

Table 3
Factors Associated with Low Back Pain among Nurses Working in Public Hospitals of Hawassa City, Sidama region, Ethiopia, 2021.

Variables		LBP		COR(95%CI)	AOR(95%CI)
		Yes	No		
Age	20–29	121	89	1	1
	30–39	92	56	1.2(0.78–1.85)	0.81(0.42–1.55)
	≥40	29	4	5.33(1.8–15.71)	1.83(0.50–6.70)
Sex	Female	154	67	2.14(1.41–3.24)	**1.82(1.07–3.08)***
	Male	88	82	1	1
BMI	<18.5 kg/m^2	8	5	1.36(0.43–4.28)	2.40(0.57–10.13)
	18.5–24.9 kg/m^2	128	109	1	1
	≥25 kg/m^2	106	35	2.57(1.62–4.08)	**2.17(1.24–3.79)****
Marital status	Single	81	70	1	1
	Married	141	73	1.66(1.08–2.55)	1.64(0.89–3.05)
	Divorced/widowed	20	6	2.88(1.09–7.57)	0.86(0.24–3.07)
Working unit	Medical ward	38	34	1	1
	Surgical ward	35	12	2.60(1.16–5.82)	1.75(0.68–4.50)
	Pediatric Ward	44	23	1.71(0.86–3.39)	1.19(0.51–2.78)
	OPD	33	23	1.28(0.63–2.59)	0.75(0.31–1.83)
	ICU	25	18	1.24(0.57–2.66)	0.90(0.36–2.25)
	Emergency unit	42	22	1.70(0.85–3.41)	1.21(0.53–2.73)
	Other	25	17	1.31(0.60–2.84)	1.05(0.42–2.64)
Monthly income	≤4500	7	8	1	1
	>4500	235	141	1.90(0.67–5.36)	1.01(0.20–5.06)
Educational level	Diploma	27	29	1	1
	Degree and above	215	120	1.92(1.08–3.40)	1.60(0.7–3.63)
Year of experience	<5 years	79	62	1	1
	≥5	163	87	1.47(0.96–2.24)	1.15(0.61–2.16)
Health Safety training	Yes	132	93	1	1
	No	110	56	1.38(0.91–2.10)	1.14(0.64–2.00)
Physical Exercise Program	Never	59	21	2.90(1.41–5.97)	2.06(0.85–4.98)
	Sometimes	155	99	1.62(0.91–2.88)	1.39(0.70–2.75)
	Usually	28	29	1	1
Smoking status	Yes	66	23	2.05(1.21–3.47)	1.89(0.80–4.43)
	No	176	126	1	1
Alcohol Drinking	Yes	97	37	2.02(1.28–3.18)	1.74(0.84–3.61)
	No	145	112	1	1
Comfortable environment	Yes	92	88	1	1
	No	150	61	2.35(1.54–3.56)	1.53(0 0.88–2.67)
Assistance from coworkers	Yes	97	80	1	1
	No	145	69	1.73(1.14–2.61)	**1.80(1.07–3.02)***
Using Assistive devices	Yes	122	97	1	1
	No	120	52	1.83(1.20–2.79)	**1.77(1.04–3.01)** *
Shortage of staffs	Yes	140	60	2.03(1.34–3.08)	1.59(0 0.92–2.76)
	No	102	89	1	1
Sleep disturbance	Yes	154	60	2.59(1.70–3.94)	1.64(0.94–2.87)
	No	88	89	1	1
Job stress	Not stressed (<21)	86	87	1	1
	Stressed (≥21)	156	62	2.54(1.67–3.86)	1.46(0.83–2.54)
Job satisfaction	Not satisfied(<32)	76	35	1.49(0.93–2.37)	1.52(0.80–2.87)
	Satisfied (≥32)	166	114	1	1

Note: * = significant association; significant at, *p < 0.05, **p ≤ 0.01.
LBP, low back pain; COR, crude odd ratio; AOR. Adjusted odd ratio.

received assistance from coworkers [AOR 1.80; 95 % CI (1.07–3.02)]. The nurses who did not use assistive devices for patient handling were 1.77 times more likely to experience lower back pain than nurses who used assistive devices for patient handling [AOR 1.77; 95 % CI (1.04–3.01)] (Table 3).

4. Discussion

Low back pain is a common cause of disability that damages both qualities of life and work performance. Because of its public health issues, social and economic burdens have become a massive issue among the nursing population. Nurses have a high rate of occupational LBP and lumbar trauma as a result of their unique job, which requires both emotional and physical labor.

In the current study, the prevalence of low back pain a complaint was (61.89 %), which was highly prevalent. The findings were consistent with Wollega Western Ethiopia's study (63.6 %) [18], Tunisia's (58.1 %) [23], and Malaysia Malaysia's (63.1 %) [24]. This could be due to using a similar study design and including nurses in all departments, as the inherent nature of working conditions and nursing practices is often almost identical in every country.

This study found a higher prevalence of LBP compared to that found in Addis Ababa, Ethiopia(45.8 %) [17], Eastern Ethiopia(38.1 %) [13], and India (53.4 %) [6]. A possible reason for this difference in the prevalence of LBP could be the differences in time and place of study and study subjects. In our study, both male and female subjects were included, unlike the study done in India which only included female nurses.

However, the prevalence of this study is lower than the study done in Iran (70 %) [25], Jordan (78.9 %) [26], Sudan (87.5 %) [27], Saudi Arabia (85.5 %) [28], Egypt (79.3 %) [29] and Italy (80 %) [30], Malaysia (74.8 %) [31], Addis Ababa, Ethiopia (67.2 %) [14]. This discrepancy might be due to differences in the study setting, a difference in sample size (for example, in the study done in Zagazig University Hospitals Egypt and Sudan, the sample size was small, 150 and 121 nurses, respectively), and socio-demographic characteristics of study participants, a lifestyle variation between the study populations, and the questionnaires used. The study done at Zagazig University Hospitals in Egypt used the Oswestry Low Back Disability Questionnaire to assess the prevalence of low back pain. However, in our study, the Nordic Musculoskeletal Questionnaire was used. Regardless of the modernization status of the country, pain could occur if there were no preventive measures taken while working.

According to this study, females are 1.82 times more likely to have low back pain when compared to males [AOR 1.82; 95 % CI (1.07–3.08)]. This is consistent with previous research conducted in Jordan [26], Amhara region Ethiopia, [32]. Sudan [27] South Africa [33], This could be related to physiological differences between males and females, such as menstruation and pregnancy, as well as anatomical and structural differences, hormone changes (especially in postmenopausal women, estrogen levels decrease, and collagen wasting), gynecological disorders, and childbirth. In the African context, women are more likely than men to be exposed to household activities so LBP could be a combination of work and home exposure. Other research, on the other hand, has shown no link between LBP and gender [25].

In the present study, a significant association was found between low back pain and being overweight. The risk of experiencing low back pain was 2.17 times higher in $\geq$25 than in 18.5–24.9 [AOR 2.17; 95 % (1.24–3.79)]. Obesity puts more strain on the low back and leads to decreased abdominal muscle strength, increasing the risk of herniation, disc degeneration, and compression. Our findings were consistent with the study in Jordan [26], South Africa [33], and South India [6]. On the other hand, a study conducted among nurses working in the Suydar region of Saudi Arabia found no link between LBP and BMI [34]. This disparity could be due to lifestyle, work environment, and workload differences.

In addition, the present study reveals that the participants who did not use assistive devices for patient handling were 1.77 times more likely to experience low back pain than their counterparts [AOR 1.77; 95 % CI (1.04–3.01)]. Perhaps they have not been retrained on best practices due to a lack of time or restricted availability of specific equipment that can facilitate handling, such as a wheelchair, lift, transfer beds, and automated beds, which can reduce spine injuries. According to Amhara region studies, nurses who did not use assistive devices for patient handling were 2.3 times more likely to have LBP [32]. It is also supported by cross-sectional studies conducted in Gaziantep, Turkey [35]. The possible rationale is that utilizing available assistive devices for patient handling activities allowed nurses to efficiently do their tasks without fatigue, reducing the mechanical burden on their bodies, particularly their lower backs.

Nurses who did not get coworker assistance were 1.80 times more likely to have LBP than nurses who got assistance from coworkers [AOR 1.80; 95 % CI (1.07–3.02)]. This discovery may be linked to nurse shortages in hospitals, and this insufficient staffing may increase the number of occasions when nurses move or raise their patients without the support of other nurses, causing them to continually hold unsafe and awkward postures, which leads to LBP. Although this study did not find a significant correlation, it reported that 51.15 % of the staff experienced shortages. This finding is consistent with a previous study conducted in Turkey, which found that nurses who did not receive sufficient support from their colleagues were 3.5 times more likely to experience lower back pain (LBP) than those who did receive adequate assistance [36].

5. Strengths and limitations of this study

5.1. Strength

- The study used a valid standard assessment tool (modified Nordic Musculoskeletal Assessment Tool) to assess lower back pain.
- A Simple random sampling technique with a lottery method, which increases the representativeness of the result, was used to recruit participants for the study.

5.2. Limitation

- Since the study assesses a one-year prevalence of low back pain, a recall bias might have an effect.
- The study design employed to address the study's aims does not show a cause-and-effect relationship between the outcome and independent variables.

6. Conclusion

According to the findings of this study, low back pain is a significant public health issue among nurses in the Hawassa Sidama region's public hospitals. Nurses had a high prevalence rate of low back pain, indicating that the problem in the study area was severe. Sex (females), BMI ($\geq$25 kg/m^2), not seeking support from coworkers, and not using assistive devices for patient handling were all relevant factors in the development of LBP, according to this study.

Recommendation

- ✓ Hospitals and health policymakers have to provide all necessary assistive equipment for patient care and train nurses to use it in everyday practice.
- ✓ Encourage nurses to develop a habit of regular physical activity and provide facilities such as a gym within the hospital to help nurses maintain a healthy weight.
- ✓ Each nurse better maintains a healthy body weight and supports one another while performing tasks.
- ✓ It is essential to do a longitudinal study to generate more scientific information on the factors contributing to LBP in nurses.

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Consent for publication

Not applicable.

Patient and public involvement

Patients and the public were not involved in the design, conduct, reporting, or dissemination plans of this research.
Patient consent for publication is not required.

Ethics

Ethical approval was obtained from the institutional review board (IRB) with reference number IRB/124/13 of Hawassa University College of Medicine and Health Sciences. Hawassa University School of Nursing wrote a formal letter to selected hospitals. The trained data collectors explained the objective of the study to the participants. Informed consent was obtained from each participant. Confidentiality was assured. Participation was voluntary, and withdrawal from the study was highly respected. COVID-19 prevention procedure applications, like masks and sanitizer, and a distance of at least 2 m were ensured throughout the data collection period.

Availability of data and materials

The data sets used during this study were available from the corresponding author upon reasonable request.

CRediT authorship contribution statement

Debora Banga: Writing – review & editing, Writing – original draft, Supervision, Software, Methodology, Investigation, Formal analysis, Conceptualization. **Tinbete Samuel:** Conceptualization. **Manaye Yihune:** Methodology, Formal analysis. **Gezahegn Bekele:** Methodology, Formal analysis. **Ezedin Molla:** Methodology, Formal analysis. **Yacob Abraham Borie:** Writing – review & editing, Formal analysis. **Ayantu Melese:** Writing – review & editing. **Ayele Agena:** Writing – review & editing. **Tomas Yeheyis:** Writing – review & editing, Supervision, Methodology, Formal analysis, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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List of abbreviations

(YLDs) years lived with disability
(LBP) low back pain
(DALY) Disability-adjusted life Years
(HCWs) health care workers
(HSE) Health and Safety Executive,
(HUCSH) Hawassa University Comprehensive Specialized Hospital
(BMI) Body mass index
(BSc) Bachelor science
(Msc) Master Science
(CI) confidence interval)
(AOR) Adjusted odds ratio
(COR) Crude odds ratio
(VIF) Variable inflation factor

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