



**ADDIS ABABA UNIVERSITY**  
**COLLEGE OF HEALTH SCIENCES**  
**SCHOOL OF MEDICINE**  
**DEPARTMENT OF FAMILY MEDICINE**

**PREVALENCE OF LOWER BACK PAIN AND ASSOCIATED FACTORS  
AMONG ADDIS ABABA UNIVERSITY EMPLOYEES WHO VISITED  
THE STAFF CLINIC, ADDIS ABABA, ETHIOPIA; 2022**

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**A THESIS PROPOSAL SUBMITTED TO COLLEGE OF MEDICINE AND  
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### Assurance of principal investigator

I the undersigned agree to accept all responsibilities for the scientific and ethical conduct of the research project and for the provision of required progress reports as per terms and conditions of the research publications office in effect at the time of grant is forwarded as the result of this application. I will provide timely progress report to my advisors and seek the necessary advice and approval from my primary advisor in the course of the research.

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## **ACRONYMS AND ABBREVIATIONS**

AA            Addis Ababa

AAU           Addis Ababa University

TASH        Tikur Anbessa Specialized Hospital

YLD         Years lived with disability

LBP         Lower back pain

BMI         Body mass index



## **ABSTRACT**

**BACKGROUND-** Lower back pain (LBP) is the most common musculoskeletal problem seen by general practitioners and remains the most common cause of disability in US patients <45 years of age. It is the most expensive benign condition in industrialized countries owing to the number of workdays lost.

**OBJECTIVES-** To assess the prevalence of lower back pain and its associated factors in Addis Ababa University employees, Tikur Anbassa Specialized Hospital Staff Clinic, Addis Ababa, Ethiopia from May 1, 2022, to July 31, 2022.

**METHODS-** The study was conducted at Tikur Anbessa Specialized Hospital, staff clinic where from May 1<sup>st</sup>, 2022 to July 31<sup>st</sup>, 2022. Data was collected via structured interviewer administered questionnaire. Data was entered into EPI-INFO and analyzed using analytic statistics such as frequency, mean and percentage and analytic statistics such as odds ratio, multiple linear regression model to summarize the results. P-value < 0.05 will be considered as statistically significant association and data will be presented using tables and multiple bar graphs.

**RESULTS-** The magnitude of low back pain was 313 (59%) [95% CI: (51.6%-59.9%)]. Being female [AOR = 2.674 (1.404, 5.076)], lack of regular exercise [AOR = 0.486(0.300,0.787)], smoking [AOR = 3.038(1.361,6.780)] and lack of safety training [AOR = 0.52(0.320,0.866)] job stress [AOR = 1.717(1.070,2.755)] and obesity [AOR = 2.219(1.434,3.432)] were factors significantly associated with low back pain.

**CONCLUSION AND RECOMMENDATION-** More than half of the employees of AAU who visited the staff clinic were found to have LBP. Being female, lack of regular exercise, lack of safety training, smoking, obesity and job stress were factors associated with LBP among the employees. Therefore, special empowerment should be given for females, smokers and strengthen the provision of safety training as well as stress and weight management.

**KEY WORDS-** Lower back pain, Addis Ababa University, Ethiopia



## Introduction

### Background

LBP, by definition, includes pain below the costal margin but above the inferior gluteal folds. These include pain with and without non neuropathic leg pain. In clinical practice, most practitioners have a superficial approach to this important clinical problem.

Lower back pain (LBP) is the most common musculoskeletal problem seen by general practitioners and remains the most common cause of disability in US patients <45 years of age. It is the most expensive benign condition in industrialized countries owing to the number of workdays lost.

Specific causes for LBP are uncommon and account for <15% of all such cases. In 85% of cases LBP is nonspecific; it will improve within 6 weeks, irrespective of treatment. The medical practitioner should try to establish whether the pain is mechanical or inflammatory. This distinction can often be made with the use of neurosurgical causes, which may require surgical intervention. Epidemiological evidence suggests several risk factors for the development of LBP, including smoking, obesity and physically strenuous work. However, sedentary work and psychologically taxing work are also risk factors. (1)

Contrary to popular belief, the erect posture of humans depends on the normal curvatures of the spine – and such curvatures are not thus the cause of back pain. Obesity that results in a heavy paunch and pregnancy in its later stages, can, however, distort the curvature of the spine and result in back pain. In the case of pregnancy, the pain usually ameliorates once the child is delivered. Some activities such as jogging and running on cement roads rather than cinder tracks, heavy lifting, and prolonged sitting (especially in cars, trucks, and poorly designed chairs) can provoke back pain. Nevertheless, strong psychological factors do play a role. (6)

## Statement of the problem

Globally, the age-standardized prevalence, incidence and YLDs rate of LBP were slightly decreased from 1990 to 2019, but the number of the prevalent cases, incident cases and YLDs had substantially increased, and LBP remains the leading cause of YLDs in 2019 worldwide. The number of prevalent cases was increased with age and peaked at the age of 45–54 years for both sexes, and the global prevalence rate was higher in females than in males and increased with age, peaking at the 80–84 age group in both sexes in 2019. (9)

Large prospective epidemiological studies have shown that, in those free of LBP at baseline, the best predictor of future onset is a previous history of LBP.<sup>4</sup> Therefore, to understand the epidemiology of LBP, and what predisposes someone to a trajectory of LBP in adult life, it is important to examine the condition at young ages, to determine factors responsible for onset of initial episodes, and to examine whether LBP in childhood is related to symptoms in adulthood.(2)

Globally, LBP is the leading global cause of years lived with disability (YLD).(3) It has been estimated that over 80% of the population will report low back pain (LBP) at some point in life,<sup>1</sup> and each year 7% of the adult population consult their GP with symptoms.(5)The age-standardized point prevalence of LBP was 8.20% in 1990 and decreased slightly to 7.50% in 2017. The prevalent numbers of people with LBP at any one point in time in 1990 was 377.5 million, and this increased to 577.0 million in 2017. Age-standardized prevalence of LBP was higher in females than males. LBP prevalence increased with age and peaked around the ages of 80 to 89 years, and then decreased slightly. (3)

Global YLDs were 42.5 million in 1990 and increased by 52.7% to 64.9 million in 2017. YLDs were also higher in females than males and increased initially with age; they peaked at 35–39 years of age in 1990, before decreasing, whereas in 2017, they peaked at 45–49 years of age, before decreasing. Western Europe had the highest number of LBP YLDs. (3)

According to a systematic review and meta-analysis done in 2018, it was found that the lifetime, annual and point prevalence of LBP among African nations was considerably higher than or

comparable to global LBP prevalence estimates reported. The pooled lifetime, annual and point prevalence of LBP in Africa was 47%; 57% and 39%, respectively. (5)

## 2. Literature review

According to research that analyzed studies done on LBP and physical activity over the past two decades the results showed that the number of publications on LBP and PA studies increased significantly. The subject categories predominantly focused on orthopedics, rehabilitation and sport sciences. The United States had the highest number of published papers and citations. In terms of the number of publications, amongst the top 20 journals, Spine contributed the most, whilst the British Journal of Sports Medicine had the highest impact factor. The University of Sydney had the highest number of publications.

A systematic review performed on the global prevalence of low back pain, and to examine the influence that case definition, prevalence period, and other variables have on prevalence showed that highest prevalence among female individuals and those aged 40-80 years. After adjusting for methodologic variation, the mean  $\pm$  SEM point prevalence was estimated to be  $11.9 \pm 2.0\%$ , and the 1-month prevalence was estimated to be  $23.2 \pm 2.9\%$ . A total of 165 studies from 54 countries were identified. (17)

A cross sectional study done in India on the incidence of low back pain in working adults in rural North India, 23.09% had low back pain. These patients were interviewed, and their psychosocial and demographic details were compared with 1000 controls who did not have back pain but attended outdoor for other reasons. In the low back pain group, 67% had psychosocial issues, 57% were in blue-collar jobs, 26% had to change/leave their profession, and 38% did not enjoy their present job. All patients had used NSAIDS at some stage of illness and 64% were advised exercises for the back. It was concluded that along with exercises and NSAIDS, sufficient consideration should be given to short center-based intensive rehabilitation program followed by a home-based program for chronic low back pain patients. (7)

A cross sectional study done on health care workers (HCW) in Saudi Arabia, showed that out of 740 participants, the overall prevalence of LBP in the past 12 months amounted to 73.9%. The

prevalence of LBP with neurological symptoms reached 50.0%. The prevalence of LBP necessitating medications and or physiotherapy was 40.5%, while the prevalence of LBP requiring medical consultation was 20%. Risk factors identified were working in secondary and tertiary hospitals, increased BMI, and positive history of over exertional back trauma. On the other hand, practicing regular physical exercise was a significant protective factor. (13)

A systematic review and meta-analysis done on the prevalence of LBP in Africa found the pooled lifetime, annual and point prevalence of LBP in Africa was 47% ,57% and 39%, respectively. Sixty-five studies were included in this review. Most of the studies were conducted in Nigeria and South Africa. (16)

A Nigerian cross-sectional study conducted in 2013 outlined that point prevalence of LBP was 46.8%. Occupational activities, previous back injury and tobacco smoking were significant associated factors for the total population. For the female respondents, logistic regression analysis showed that a waist circumference of 88 cm or more, dysmenorrheal, previous back injury and being engaged in an occupation were the most significant factors associated with LBP. However, previous back injury was the most significant factor associated with LBP for the male respondents.

According to a prospective study of low back pain in a general population on the location, character, aggravating and relieving factors of lower back pain most of the participants felt that the LBP became worse during the day. The most common aggravating factor was stooping, reported by 65% of the participants, followed by the sitting position, reported by 30%. Factors of highest importance for the relief of LBP were lying down (52-54%) and walking around (34-39%). A stated history of pain radiating to the leg(s) was the best indicator for occurrence of LBP in the follow-up year. (13)

Another cohort study done to investigate the role of potential physical, psychosocial and individual risk factors at baseline on the occurrence of sick leave due to LBP 1 year later showed that 6% of the workers reported sick leave 1 year later; they accounted for 12 % of the sick-leave days independent of cause. A non-stimulating psychosocial work environment turned out to be the strongest risk factor for sick leave due to LBP. (8)

A cross sectional study done in a pediatric hospital on nurses depicted that 63.6% had suffered back pain in that year of which 90.5% was in the lower back. (11) Another study showed that the prevalence of LBP in schoolteachers in rural Kenya is 64.9% where the logistic analysis showed female gender was positively associated. (12)

A population based cross-sectional study done in Ethiopia depicted that the lifetime prevalence of healthcare utilization for LBP was 36.1%, while the annual prevalence rate was 30%. Several sociodemographic factors, modifiable health behaviors/lifestyle habits, pain interrelated factors, and specific factors such as beliefs about the pain, depressive symptoms and insomnia were associated with healthcare utilization for LBP. (15)

In a study conducted among 412 intensive care unit nurses the magnitude of low back pain was 76%. Being female, unavailability of assistive device for patient handling, lack of training on intensive care, lack of regular exercise and job stress were factors significantly associated with low back pain. (20)

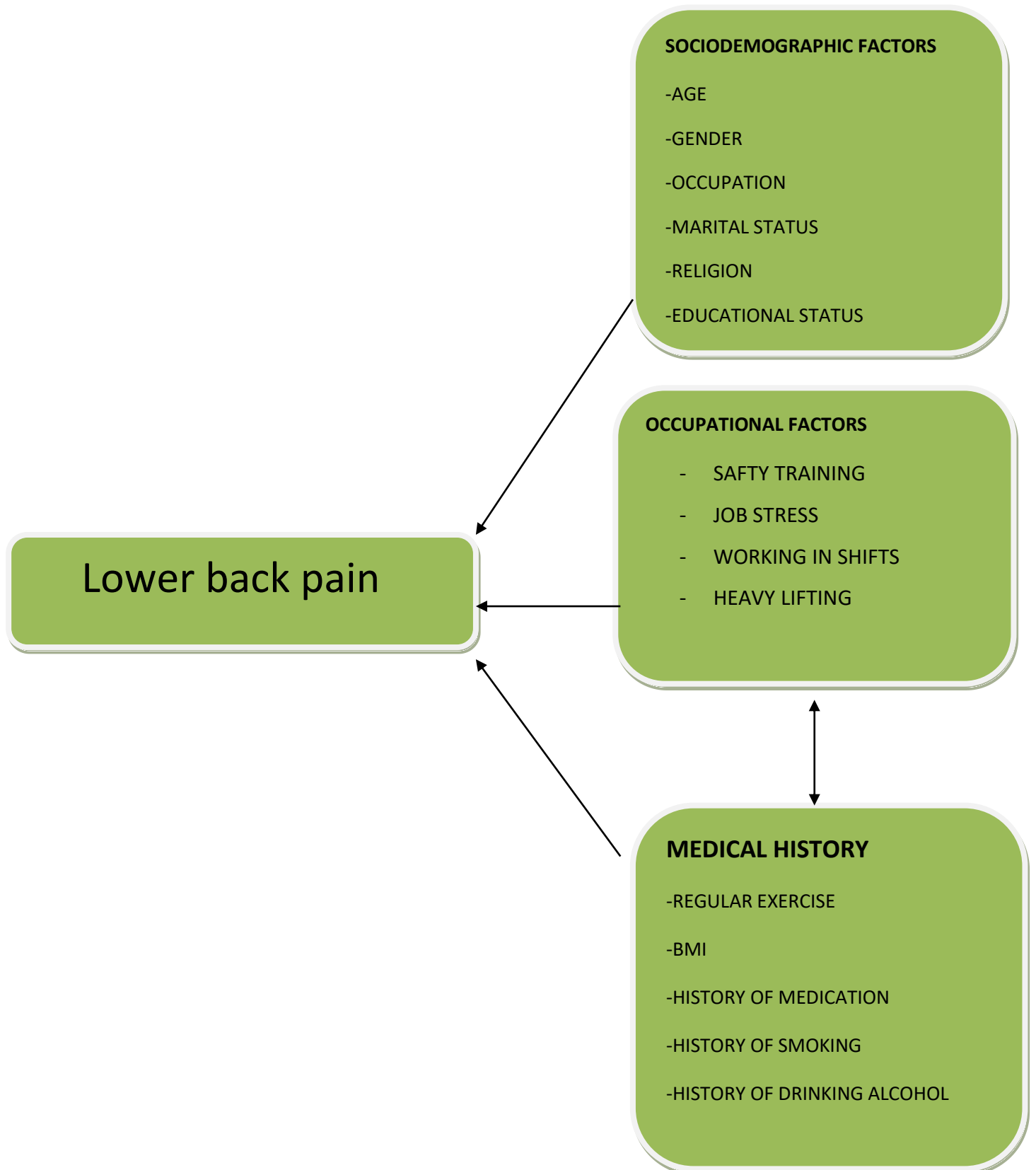
An institution based cross-sectional study conducted in Harari and Dire Dawa region, Ethiopia showed that about two in five nurses working at public hospitals in Harari region and Dire Dawa city administration were suffering from low back pain. The results showed that the 12-month prevalence of low back pain was 38.1% It was more prevalent among females (65%). More than 5 years of work experience, manual lifting of weight >10kg and working in awkward posture were variables significantly associated with low back pain among nurses. (14)

A systematic review and meta-analysis conducted in Ethiopia in 2021 on the prevalence of self-reported work-related lower back pain and its associated factors overall pooled annual prevalence of low back pain in Ethiopia was estimated to be 54.05%. Age, sex, body mass index, work experience, working hours, lack of safety training, awkward working posture, work shift, prolonged standing, lifting heavy objects, sleeping disturbance, history of back trauma, previous medical history of musculoskeletal disorder, and lack of adequate rest interval at work were significantly associated with low back pain. (10)

### **3. Significance of the study**

This study gives baseline information regarding the prevalence of lower back pain in institutions as well as provide an insight into factors that play a vital role in causing this ailment. Institutions as well as the private sector can use this research finding as an input to improve the quality of life of their employees and in turn maximize their productivity. In addition, this study can be used by other researchers to conduct research on similarly prevalent but unaddressed issues.

Figure 1: Conceptual framework of factors that affect lower back pain



## **4. OBJECTIVES**

### **4.1 General objectives**

To assess the prevalence of lower back pain and its associated factors in Addis Ababa University employees, Tikur Anbessa Specialized Hospital Staff Clinic, Addis Ababa, Ethiopia from May 1, 2022 to July 31, 2022.

### **4.2 Specific objectives**

To determine the prevalence of lower back pain in Addis Ababa University employees, Tikur Anbessa Specialized Hospital staff clinic, Addis Ababa, Ethiopia.

To identify factors associated with lower back pain in Addis Ababa University employees, Tikur Anbessa Specialized Hospital staff clinic, Addis Ababa, Ethiopia.

## **5. METHODS**

### **5.1 Study area**

Addis Ababa University (AAU), which was established in 1950 as the University College of Addis Ababa (UCAA), is the oldest and the largest higher learning and research institution in Ethiopia. Since its inception, the University has been the leading center in teaching-learning, research and community services.

Beginning with enrollment capacity of 33 students in 1950, AAU now has 47,610 students (29,872 undergraduate, 15,398 Master's and 2,340 PhD students) and 8,709 staff (3,110 academics, 4,346 admin support staff and 1253 health Professionals). In its 14 campuses, the University runs 70 undergraduate and 293 graduate programs (72 PhD and 221 Masters), and various specializations in Health Sciences.

The University is led by a President who is assisted by four Vice Presidents and one Executive Director: Academic Vice President, Vice President for Research and Technology Transfer, Vice President for Administration and Student Services, Vice President for Institutional Development and the Executive Director of the College of Health Sciences (with the rank of Vice President).

The staff clinic which is under the outpatient directorate and overseen by the director of clinical services, sees an average of 20 patients per day. Patients are seen by one Family Medicine resident and another general practitioner. The clinic is open on weekdays.

## 5.2 Study period

The study will be conducted from May 1, 2022, to July 31, 2022, G.C.

## 5.3 Source population

Source population is all employees of Addis Ababa University.

## 5.4 Study population

Study population is all patients who visited the staff clinic of Tikur Anbessa specialized hospital from May 1 2022 to July 31, 2022.

## 5.5 Sample size determination

The sample size for the prevalence was calculated by using single proportion formula:

The actual sample size for the study was determined by using single population proportion formula for single proportion population,

$$n_i = \frac{(Z_{\alpha/2})^2 \times p(1-p)}{d^2}$$

Where  $n_i$  = Initial estimated sample size

$Z$  = Confidence level (alpha,  $\alpha$ )

$P$  = prevalence

d = marginal error

To determine the sample size the following assumption were used.

The prevalence of lower back pain taken from a previous related study conducted at Addis Ababa, Ethiopia is 54.05%. A 95% confidence level, margin of error (0.05).

$$N_i(1) = \frac{(1.96)^2 \times 0.54(1-0.54)}{(0.05)^2} = 382$$

Since the total population (Total number of employees in AAU) is less than 10,000, I used the correction formula -

$$n_f = \frac{n_i}{1+n_i/N}$$

Where  
nf = final sample size  
ni = initial sample size  
N = total population

When we add, 10% non-respondent percentage, final sample size was found to be 420

The sample size for the associated factors was calculated using statcalc for selected potential variables:

Table 1: summary of sample size calculation for associated factors with SMBG

Variables as exposure	Assumptions					Sample size
	OR	P	ratio	power	CI	
Fem6	2.67	47.3%	1:1	80%	95%	320
Job stress	3.66	37.6%	1:1	80%	95%	184

Regular exercise	2.16	36.1%	1:1	80%	95%	432
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## 5.6. Sampling procedure

A systematic random sampling technique was used. Among 400 patients seen on average in one month 432 were selected randomly and proportionally allocated to each day that the staff clinic is open in the month.

## 5.7 Eligibility: Inclusion and Exclusion Criteria

### 5.7.1. Inclusion Criteria:

Employees of Addis Ababa University who visit the Tikur Anbassa Specialized Hospital Staff clinic.

### 5.7.2. Exclusion Criteria

Visitors of the Staff clinic who are not employees of AAU.

Visitors of the staff clinic who are unable to communicate or patients with psychiatric illness.

## 5.8. Study variable

### Dependent Variables

- Lower back pain

### Independent Variables

- Socio demographic factors (Sex, Age, Education, Occupation, Income Residency)
- Occupation related (Safety training, Job stress, Working in shifts, Heavy lifting)
- Individual and psychosocial (Regular exercise, Numerical pain score, BMI, History of smoking, History of drinking alcohol, History of medication for LBP)

## **5.9 Operational definition**

Job stress is a score measured using the workplace stress scale as yes (16 to 40) and no (lower than or equal to 15). (18)

Physical exercise refers to performing any kind of physical exercise at least two times per week for 30 minutes. (19).

Safety Training refers to any kind of training in a one-year period through any kind of media about health and safety rules related to one's own occupation.

## **5.10 Data collection and Methods**

Data will be collected through interviewer administered interview using a structured questionnaire, which is developed after thoroughly reviewing previous relevant literatures and modified after intensive literature reviews. I will be using the Extended Nordic musculoskeletal questionnaire and NIOSH Generic Job Steps Questionnaire by Center for Disease Control. Data will be entered into Epi Data entry version 4.2.0. Then, it will be exported to and analyzed by Statistical Package for the Social Sciences (SPSS). Socio demographic characteristics and clinical characteristics will be summarized using frequency tables. Mean and standard deviation will be calculated for continues data. Multivariate linear regression analysis will be carried out to determine factors independently associated with LBP with a p-value of less than or equal to 0.05 will be considered as statistically significant.

## **6. ETHICAL CONSIDERATION**

An ethical clearance and official letter will be obtained from the Research and Ethics Committee of AAU, Tikur Anbessa, specialized hospital. After getting permission from the hospital to participate in the study, verbal and written consent will be obtained. I will also inform that there won't be any incentive or harm for their participation in this study. Finally, participant's identity will be unnamed during data collection and analysis.

## 7. Results

### 7.1. Sociodemographic characteristics

This study was conducted with a total of 376 study participants, which yields a response rate of 98.4%. The minimum and maximum age of the study participants was 24 and 71 years old respectively with the mean of 44 years + 13 years.

The minimum and maximum amount of estimated monthly income of study participants was 2000 and 20000 ETB respectively with the mean of 7711 +4256 ETB.

Table 2: Socio demographic characteristics of the employees at Addis Ababa University, Addis Ababa, Ethiopia, 2022

<b>Variables</b>	<b>Category</b>	<b>Frequency(n)</b>	<b>Percentage (%)</b>
AGE	18-35	127	30.2
	36-45	122	29.0
	46-60	138	32.9
	>61	33	7.9
SEX	Female	256	61.0
	Male	164	39
MARITAL STATUS	Single	140	33.3
	Married	138	32.9
	Divorced	28	6.7

	Widowed	49	11.1
	Separated	65	15.5
EDUCATIONAL STATUS	unable to read and write	12	2.9
	only read and write	108	25.7
	primary	153	36.4
	secondary	68	16.2
	college and above	79	18.8
RELIGION	orthodox	125	29.8
	Muslim	171	40.7
	Protestant	124	29.5

## 7.2. Organizational related characteristics

Out of 420 study participants, 205 (48.1%) of them were working in shifts (day and night alternatively) and only one fourth of them (24.3%) did not receive any kind of safety training before beginning their job. It was also found that 267(63.6%) were required to carry heavy weights (more than 10kgs) as part of their job. Almost three fourth of participants 301(71.7%) had job related stress.

### 7.3. Individual and psychosocial characteristics

While a majority of participants 310 (73.8%) has no habit of doing regular exercise, almost half 202 (48.1%) them were found to be obese (BMI>24.5). Apart from that 191(45.5) admitted to drinking alcohol and 43 (11.2%) participants were found to smoke cigarettes.

<b>Variables</b>	<b>Categories</b>	<b>Frequency(n)</b>	<b>Percentage(%)</b>
Heavy lifting	Yes	267	63.6
	No	153	36.4
Regular exercise	Yes	110	26.2
	No	310	73.8
BMI	<18.5	7	1.7
	18.6-24.5	211	50.2
	>24.6	202	48.1
Job stress	yes	301	71.7
	No	119	28.3

#### 7.4. Magnitude of lower back pain and associated characteristics

Among the total study participants, 248 (59%) of them experienced low back pain for at least one-day duration in the last 12 months. The majority of them had experienced low back pain levels of moderate intensity. From those participants who experienced LBP 117 (47.1%) of them used antipain medications.

#### 7.5. Factors associated with low back pain

In bivariable logistic regression analysis factors such as sex, age, lack of regular exercise, smoking, obesity, job stress, lack of safety training and work shift were associated with low back pain at p-value <0.25. In multivariable logistic regression analysis, job stress, exercise, sex, safety training and smoking were significantly associated with low back pain.

Females were 1.71 times more likely to develop lower back pain as compared to their male counterparts. Those participants that had no habit of regular exercise were 52% more likely to develop LBP and those who had safety training were 48% less likely to have LBP as compared to those who didn't receive safety training. Similarly, participants who are obese are twice as likely to have LBP when compared to those who have normal BMI. In addition, the odds of having lower back pain in those who have a habit of smoking cigarettes was three times as high as those who have no habit of cigarette smoking.

*Table 4: Factors associated with lower back pain among AAU staff clinic at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia, 2022*

Variables	Category	SMBG		COR (95%CI)	AOR (95%CI)
		Yes	No		

<b>Sex</b>	Male	84	80	0.589(0.395,0.878)	1
	Female	164	92	1	1.719(1.107,2.672)**
<b>Age</b>	18-30	63	64	1	1
	31-45	63	59	1.778(0.807,3.917)	1.541(0.662,3.586) *
	46-60	101	37	1.639(0.741,3.624)	1.603(0.685,3.752) *
	>61	21	12	0.641(0.287,1.431)	0.666(0.284,1.563) *
<b>Smoking</b>	Yes	37	10	1	1
	No	211	162	0.352(0.170,0.729)	3.038(1.361,6.780)
<b>Lack of regular exercise</b>	Yes	50	60	1	1
	No	198	112	2.121(1.365,3.298)	2.170 (1.351,3.484) **
<b>Job stress</b>	Yes	189	112	1	1
	No	59	60	0.583(0.380,0.895)	1.717(1.070,2.755) **
<b>BMI</b>	Normal	107	104	1	1
	Underweight	3	4	0.729(0.159,3.337)	2.974(0.535,16.543) *
	Obese	138	64	0.348(0.076,1.600)	2.219(1.434,3.432) **
<b>Safety training</b>	Yes	48	54	1	0.526(0.320,0.866) **
	No	200	118	1.907(1.215,2.992)	1
<b>Work shift</b>	Yes	135	70	1	1
	No	113	102	1.741(1.174,2.581)	1.569(1.022,2.408) *

*\*Indicated variables having P-value <0.25 in bivariate analysis and*

*\*\* indicates variables having P-value <0.05 in multivariable logistic regression model*

## 8. DISCUSSION

Low back pain is a major cause of disability that affects the quality of life as well as work performance. The high prevalence of low back pain in employees of AAU negatively affect the quality of work performance and job satisfaction.

In this study, the magnitude of low back pain was 59% [95% CI: (51.2%-68.4%)]. This is in line with studies conducted in Malaysia (63.1%), Brazil (67%), Bahirdar, Ethiopia (64.07%) [9], Wollega (63.3%). This might be due to a similar operational definition of low back pain, study design, and setting.

However, the prevalence of low back pain in this study was lower than different studies conducted in China (80%) [6] and Taiwan (82%) [21]. The discrepancy might be due to differences in pain reporting culture, lifestyle, and socio-demographic characteristics of study participants. Asians show an extravagant display of emotion in the presence of pain, but African people value stoicism, restraint, and playing down of pain [13,19]. In addition to this, African individuals considered mild pain as normal and may not report as having pain.

In this study, females were almost twice as likely to develop low back pain than males. This finding is supported by studies conducted in Uganda [8], South Africa [15], and Nigeria [18]. This is due to physiologically low disk space in females that predispose to low back pain and as age increases in females' estrogen level decreases and collagen wasting occurs, as a result, females might experience low back pain more than males [14]. The physical stress of child-rearing and perimenopausal abdominal weight gain may also contribute to the occurrence of low back pain in females [9].

In this study, employees who didn't perform regular exercise were 2.16 times more likely to experience low back pain when compared with those employees who perform regular exercise. This is in line with studies conducted at Adama hospital medical college staff and turkey Istanbul ICU nurses [17]. The possible justification could be regular exercise improves physical fitness, which prevents easy fatigability of back muscles that reduce the incidence of low back pain [16]. The other possible reason is, those nurses who perform regular exercise can acquire normal body weight, which indirectly prevents low back pain by reducing their weight; since most studies

suggested that overweight employees are more at risk for low back pain when compared with nurses who have normal body weight.

In this study, those employees who had job stress were three times more likely to experience low back pain when compared with those who didn't have job stress. This finding is supported by a study conducted at Addis Ababa, Ethiopia among nurses [10]. The possible justification could be when employees become stressed at work by different assigned tasks, they become physically fatigued and fatigue negatively influences pain receptors by increasing sensation leading to low back pain. This implies that the working environment should be pleasant, safe, have adequate rest time, and create a sense of team spirit within health care workers.

Lack of special training in employees was also the other factor that was significantly associated with the experience of low back pain participants. The odds of experiencing LBP in this study were almost doubled in those employees who didn't take safety training when compared with those who have taken the training. This study was supported by a study conducted in Wollega [18]. It is also strengthened by an interventional study which

was conducted in turkey, that showed health care staff who engaged in training on patient transferring and lifting perform six out of seven behaviors better than they did previously [12].

In our study, participants who didn't receive safety training were twice as likely to experience LBP as compared to those who did get the training. Even though the exact relationship between taking training and low back pain was not established, training increases awareness of employees towards preventive measures of low back pain in the workplace that leads to behavioral change and maintenance of workplace safety cultures [18]. This implies that training should be provided for employees of AAU on body mechanics to reduce the burden of low back pain and associated poor quality of care.

## **9. Limitations of the study**

The cross-sectional nature of the study design prevents us from drawing causal inferences about the relationship between the chosen covariates and outcome variables. The study looked at only a single facility and hence caution should be well-thought-out in extrapolating the results.

## **10. Conclusion**

The prevalence of low back pain among employees of AAU was found to be high. Being female, lack of regular exercise, job stress, history of smoking, lack of safety training were factors significantly associated with low back pain. Health policymakers and hospital administrative bodies should emphasize the accessibility of safety training, provision of training on stress management, and adaptive working environment for their employees. Research evidence using prospective cohort studies is also recommended to establish cause and effect relationships.

## **11. Recommendation**

In accordance with the results of this study, we recommend that the institution emphasize on the need for precautionary methods of LBP prevention such as establishment of gymnasiums and campaigns that focus maintaining healthy body weights. Special attention should also be given for female and employees that have history of smoking.

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INFORMATION SHEET AND INFORMED CONSENT

Dear respondent:

Hello, my name is Dr. Fana Tadesse. Today I am here to collect data to assess the prevalence and factors that affect lower back pain in patients that visit staff clinic of Tikur Anbessa Specialized Hospital. The information I interviewed and the answers you give will be very useful in the realization of this study, and it will be kept confidential. The Name and Address of the participant will not be recorded. Your information is very important for the study. And we would like to confirm to you that all your data are confidential and used for research purpose only.

Are you willing to participate in this study?

Sign-----

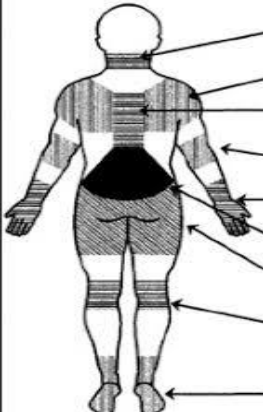
Thank you for spending your precious and valuable time.

Thank you for your participation.

<b>Section 1: Sociodemographic question</b>	
1.1.Age	<ul style="list-style-type: none"> <li>a) 18-30</li> <li>b) 31-40</li> <li>c) 41-50</li> <li>d) 51-60</li> <li>e) &gt;60</li> </ul>
1.2.Sex	<ul style="list-style-type: none"> <li>a) Male</li> <li>b) Female</li> </ul>
1.3.Marital status	<ul style="list-style-type: none"> <li>a) Single</li> <li>b) Married</li> <li>c) Divorced</li> <li>d) Separated</li> <li>e) Widowed</li> </ul>
1.4.Educational level	<ul style="list-style-type: none"> <li>a) Never attended</li> <li>b) Primary school</li> <li>c) Secondary school</li> <li>d) Post-secondary</li> </ul>
1.5.Occupation	<ul style="list-style-type: none"> <li>4. Government employed</li> <li>5. Self employed</li> <li>6. Student</li> <li>7. Unemployed</li> <li>8. Farmer</li> <li>9. House wife</li> </ul>
1.6.Monthly income	<ul style="list-style-type: none"> <li>1. &lt;2000</li> <li>2. 2000-5000</li> <li>3. 5000-10,000</li> <li>4. &gt;10,000</li> </ul>
1.7.Place of residence	<ul style="list-style-type: none"> <li>a) Rural</li> <li>b) Urban</li> </ul>
1.8.Religion	<ul style="list-style-type: none"> <li>a) Orthodox</li> </ul>

- b) Protestant
- c) Muslim
- d) Waqffeta
- e) Others

### Section 2: Musculoskeletal pain assessment

	Have you at any time during the last 12 months had trouble (such as ache, pain, discomfort, numbness) in:	During the last 12 months have you been prevented from carrying out normal activities (e.g. job, housework, hobbies) because of this trouble in:	During the last 12 months have you seen a physician for this condition:	During the last 7 days have you had trouble in:
	NECK	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
	SHOULDERS	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
	UPPER BACK	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
	ELBOWS	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
	WRISTS/ HANDS	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
	LOWER BACK	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
	HIPS/ THIGHS	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
	KNEES	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes
	ANKLES/ FEET	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Yes

### Section 3: Patient related factors.

2.1. BMI	<ul style="list-style-type: none"> <li>a) Less than 18.5</li> <li>b) 18.5-24.5</li> <li>c) More than 24.5</li> </ul>
2.2. Previous history of back pain	<ul style="list-style-type: none"> <li>a) Yes</li> <li>b) No</li> </ul>
2.3. Has taken safety training	<ul style="list-style-type: none"> <li>a) Yes</li> <li>b) No</li> </ul>
2.4. History of trauma	<ul style="list-style-type: none"> <li>a) Yes</li> <li>b) No</li> </ul>
<b>Posture Assessment</b>	
During my work I keep a good posture	<ul style="list-style-type: none"> <li>a) Always</li> <li>b) Sometimes</li> </ul>

	c) Never
At work I sit in one position for long hours	a) Always b) Sometimes c) Never
When I work, my head is bended	a) Always b) Sometimes c) Never
In work, I perform repetitive tasks	a) Always b) Sometimes c) Never
<b>Job Demand and social support</b>	
I work under extensive work pressure	a) Always b) Sometimes c) Never
I find my work tasks difficult	a) Always b) Sometimes c) Never
I have too many job tasks	a) Always b) Sometimes c) Never
My work atmosphere is comfortable	a) Always b) Sometimes c) Never
My colleague are friendly	a) Always b) Sometimes c) Never
I can ask and inquire about my work	a) Always b) Sometimes

	c) Never
<b>Job stress</b>	
Conditions at work are unpleasant or sometimes even unsafe.	<ul style="list-style-type: none"> <li>1) Never</li> <li>2) Rarely</li> <li>3) Sometimes</li> <li>4) Often</li> <li>5) Very often</li> </ul>
I feel that my job is negatively affecting my physical or emotional well being.	<ul style="list-style-type: none"> <li>1) Never</li> <li>2) Rarely</li> <li>3) Sometimes</li> <li>4) Often</li> <li>5) Very often</li> </ul>
I have too much work to do and/or too many unreasonable deadlines.	<ul style="list-style-type: none"> <li>1) Never</li> <li>2) Rarely</li> <li>3) Sometimes</li> <li>4) Often</li> <li>5) Very often</li> </ul>
I find it difficult to express my opinions or feelings about my job conditions to my superiors.	<ul style="list-style-type: none"> <li>1) Never</li> <li>2) Rarely</li> <li>3) Sometimes</li> <li>4) Often</li> <li>5) Very often</li> </ul>
I feel that job pressures interfere with my family or personal life.	<ul style="list-style-type: none"> <li>1) Never</li> <li>2) Rarely</li> <li>3) Sometimes</li> <li>4) Often</li> <li>5) Very often</li> </ul>
I have adequate control or input over my work duties.	<ul style="list-style-type: none"> <li>1) Never</li> <li>2) Rarely</li> </ul>

	<ul style="list-style-type: none"><li>3) Sometimes</li><li>4) Often</li><li>5) Very often</li></ul>
I receive appropriate recognition or rewards for good performance.	<ul style="list-style-type: none"><li>1) Never</li><li>2) Rarely</li><li>3) Sometimes</li><li>4) Often</li><li>5) Very often</li></ul>
I am able to utilize my skills and talents to the fullest extent at work.	<ul style="list-style-type: none"><li>1) Never</li><li>2) Rarely</li><li>3) Sometimes</li><li>4) Often</li><li>5) Very often</li></ul>