

**ARSI UNIVERSITY COLLEGE OF HEALTH SCIENCES DEPARTMENT
OF PUBLIC HEALTH**



**MAGNITUDE OF LOW BACK PAIN AND ASSOCIATED FACTORS AMONG
TEACHERS IN ASELLA TOWN, ARSI ZONE, OROMIA ETHIOPIA 2025 GC**

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ABBREVIATION AND ACRONYMS

AOR	Adjusted Odd Ratio
BMI:	Body Mass Index
CLBP:	Chronic Low Back Pain
CI:	Confidence Interval
COR	Crude Odd Ratio
ETB:	Ethiopian Birr
LBP:	Low Back Pain
OR:	Odds Ratio
YLDs:	Years Lived With Disability

ABSTRACT

Background: - Low back pain (LBP) has been recognized as a common occupational problem with a high prevalence among work-related musculoskeletal disorders. Although there appears to be a high prevalence of LBP among school teachers, Low back pain is a widespread problem with a lifetime prevalence of more than 70% in developed countries. There is a gap in studies specifically focusing on teachers in Ethiopia. The aim of this study was to investigate the prevalence of and risk factors for LBP among primary, secondary and high school teachers

Objective: The study investigate the Magnitude of low back pain (LBP) and associated factors among teachers in Asella town, Oromia, Ethiopia.

Method and material: The study employed a cross-sectional design, conducted from April to May 2025 in Asella town. The target population includes all teachers working in Asella town. With Random sampling technique a sample size of 319 teachers were recruited. Data was collected using a standardized questionnaire. Data analysis was including descriptive statistics to determine the magnitude of low back pain and describe the study population. Analytical statistics, including logistic regression, was used to assess associations between low back pain and risk factors. Odds ratios (OR) with 95% confidence intervals (CI) were calculated.

Result: - Out of 319 respondents participated, resulting in a 100% response rate. The study found that 46.4% (95% CI 40.8–51.7%) of respondent have occurrence of low back pain. Factors independently associated with occurrence of low back pain included: The multivariable analysis sex (AOR = 2.119), age group (AOR = 0.186 for 30–40 years, $p = 0.004$; AOR = 0.823 for >40 years, $p = 0.001$), work shift (AOR = 0.55; 95% CI: 0.40–1.13; $p = 0.03$) and work experience (AOR = 0.40; 95% CI: 0.22–0.65; $p = 0.001$) are associated with low back pain.

Conclusion: - Overall, the study revealed that low back pain (LBP) is relatively high among teachers in Asella Town and sex, age, work shift, and work experience were significantly associated with low back pain. Preventive measures should be in place to prevent and reduce the progression of LBP disability.

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1. INTRODUCTION

1.1 Background

Low back pain (LBP) represents a substantial global health concern, recognized as a leading cause of disability and a significant contributor to lost workdays worldwide (1). Globally 9.4 % people suffer from low back pain (2). The overall estimated pooled prevalence of chronic low back pain in African school teachers was found to be 59.0%. Being female, older, physically inactive, having sleep problems and a history of injury were factors significantly associated with LBP (3). Low back pain is characterized by pain originating in the lower spinal column, predominantly in the lumbar and sacral segments, with potential radiation to the buttocks and lower extremities (4). Occupational factors are strongly linked to low back pain. Prolonged sedentary work, heavy workloads, and poor sitting posture are all recognized contributors to this condition (5). Low back pain is a pervasive musculoskeletal disorder with significant global health implications (6).

It is a leading cause of disability, absenteeism from work, and reduced quality of life, imposing a substantial economic burden on individuals, healthcare systems, and national economies. LBP is a complex condition influenced by a combination of factors, including physical, psychological, and occupational exposures (7). Within the occupational context, certain professions are recognized as having a higher risk of LBP due to specific physical demands. The teaching profession, particularly at the high school level, presents several potential risk factors for LBP (8, 9). Study done in Mekelle Ethiopia shows that the prevalence of low back pain among teachers are 74.8% (10). In addition study done in west Arsi shows that prevalence of low back pain among workers 63.8% (11).

High school teachers often spend considerable time standing while instructing, which can place stress on the spinal structures. They also engage in prolonged periods of sitting during lesson preparation, grading papers, and administrative tasks. Additionally, repetitive movements, such as writing on the board, and occasionally lifting or carrying teaching materials, can contribute to the development of LBP (12). Low back pain (LBP) represents a significant global health challenge, impacting individuals across various demographics and professions (13). Characterized by pain localized below the costal margin and above the inferior gluteal folds,

LBP can range from acute, short-lived episodes to chronic, persistent pain that significantly diminishes quality of life and functional capacity(14).

While studies have examined LBP in various occupational groups, there is a need for further research specifically focusing on high school teachers to understand the prevalence and associated factors within this population (15). This study aims to address this gap by investigating the prevalence of LBP and identifying the contributing physical, psychological, and occupational factors among high school teachers.

1.2 Statement of the Problem

Low back pain (LBP) is a prevalent and debilitating condition, significantly impacting individuals' quality of life and work productivity(16).A review on the epidemiology of LBP in sub-Saharan countries including Ethiopia has shown the prevalence of LBP among primary school teachers, farmers and long-distance truck drivers were 30.1%(3).A study done in Mekele among primary school teachers showed the prevalence of low back pain was 74.8%.(10). Being female sex, smoking habit, doing regular physical and sleep disturbance were predicting which made significant association with low back pain(17).Teachers, due to the physical demands of their profession, including prolonged standing, repetitive movements, and awkward postures, are considered a high-risk group for developing CLBP(18). This problem is further compounded by factors such as stress, classroom management responsibilities, and the potential for limited ergonomic support in the classroom environment(19).

The Global Burden of Disease study consistently ranks LBP among the leading causes of years lived with disability (YLDs), highlighting its profound impact on global health and productivity. This burden translates into substantial economic costs for individuals, healthcare systems, and societies due to direct healthcare expenses, lost workdays, and disability claims(20).

The etiology of LBP is complex and multifactorial, involving an intricate interplay of biological, psychological, and social factors(21). While specific pathological conditions such as disc herniation, spinal stenosis, and spondylolisthesis can be identified in some cases, the vast majority of LBP cases are classified as non-specific(22, 23).

Physical factors contributing to various conditions can be categorized as biomechanical and individual. Biomechanical factors encompass aspects like posture, lifting techniques, repetitive movements, and prolonged static postures. Individual factors, on the other hand, include characteristics such as age, sex, body mass index (BMI), and physical fitness, all of which can influence susceptibility and outcomes (24-26). Psychosocial factors such as stress, anxiety, depression, job satisfaction, work-related stress, and coping mechanisms can significantly influence the experience and perception of pain(27, 28). Occupational factors, including specific job demands like, repetitive tasks, prolonged standing or sitting, and exposure to vibrations, are known to increase the risk of lower back pain (LBP)(29).

Within the occupational landscape, the teaching profession, particularly at the high school level, presents a unique constellation of risk factors for LBP (30). Prolonged standing, such as instructing students for extended periods involving demonstrations, laboratory work, or active classroom management, places sustained stress on the lower back, potentially leading to muscle fatigue, ligament strain, and disc compression due to constant weight-bearing(31).

Despite the recognized risk factors inherent in the teaching profession, there is a significant gap in research specifically addressing the prevalence and associated factors of LBP among high school teachers. Much of the existing research on LBP in teachers focuses on the broader teaching population, encompassing elementary, middle, and high school teachers, or even preschool educators. This lack of specificity makes it difficult to understand the unique challenges faced by high school teachers and to develop targeted interventions tailored to their specific needs.

1.3. Significance of the study

This study investigating low back pain (LBP) among teachers in Asella town is justified by the significant global burden of LBP as a public health concern. LBP is a leading cause of disability worldwide, negatively impacting quality of life, productivity, and healthcare systems.

The Global Burden of Disease study consistently ranks LBP among the top causes of years lived with disability, underscoring the need for research to understand its prevalence and contributing factors across diverse populations. The teaching profession, particularly presents a unique occupational risk profile for LBP.

Teachers frequently engage in prolonged standing during instruction, prolonged sitting during preparation and administrative tasks, repetitive movements like writing and computer use, and occasional lifting of materials. These combined factors create a heightened vulnerability to developing LBP among this occupational group.

2. LITERATURE REVIEW

2.1 prevalence of low back pain among teachers

Globally, it is estimated that 619 million people live with low back pain. LBP frequently results in decreased productivity at work, which places a significant financial strain on both individuals and society as a whole (32). Studies suggest that 60% to 90% of people can suffer from low back pain at some point in their life (32, 33). Approximately, a quarter of years lived with disabilities resulting from low back pain were linked to occupational ergonomic factors which includes prolonged standing, sitting or bending (34).

The global prevalence of low back pain among the general population is estimated to be 30% to 80% (35). Prevalence of LBP varies depending on the type of activity performed and it can affect all ages, any gender, and any socioeconomic background(36). One of the occupational categories most impacted by LBP is high school teachers (37). School teachers were considered to have a widely varied prevalence rate of LBP, ranging from 16.6% in Lahore, Pakistan (38) 45.6% in China (39), 74.9% in Turkey (39).study done in Indonesia shows that smoking is associated with low back pain among teachers(40).

Study conducted in Pahang; Malaysia showed that 60.8% of secondary school teachers reported lower back pain. Female participants reported higher prevalence of lower back pain than male participants (41). Another longitudinal study in Selangor, Malaysia in 2016 showed 44% of the participants reported having lower back pain after 12 follow up (42).

27% of secondary school teachers reported having acute episode of low back pain in Kanpur, India (43). Whereas 57.3% of male high school teachers were reported history of low back pain in Taif City, Saudi Arabia (43). Another study in Saudi Arabia also reported 35.1% of male teachers had history of low back pain (44).

Study conducted in Iran revealed that Over a 12-month period, 68.8% of high school teachers self-reported having LBP(45). Female teachers had a significantly higher prevalence rate than males and another study in Iran also reported 31.6% of low back pain among high school teachers at the point (37). In the Philippines, 56% of high school teacher study participants had low back pain which is higher prevalence than other form of musculoskeletal disorder (46).

Among African teachers, the overall pooled prevalence of LBP is 59.0% (4). Study conducted among primary and high school teachers in Tunisia showed higher prevalence of low back pain (71.8%) (46, 47) and study done among primary and high school teachers in Egypt reported lower prevalence of LBP (53.2%) (48). According to study done among primary and secondary school teachers in Botswana, 55.7% of school teachers reported low back pain over 12-month with 67.1% of them reported minimal pain (49). Study done among secondary school teachers in Nigeria reported 62.7% of study participants experienced LBP in their career (50).

According to study conducted in Ethiopia, 57.5% of primary and secondary school teacher participants reported low back pain (51) and another study in Ethiopia found that 63.7% of high school teacher participants experienced low back pain during last 12 months (11).

2.2 factors associated with low back pain

According to study conducted in the Finland, being female, abdominal obesity, smoking, and strenuous physical exercise were significantly associated with low back pain (36). Incidence of low back pain was significantly related with old age, female gender, and increased number of classes per week (24). other study found that anxiety and lifting heavy weight were strongly associated with low back pain (42).

Study done in Pakistan found history of trauma, long duration of using electronic device, and long duration of standing as predictors of musculoskeletal disorders including low back pain (38). Akward arm posture, akward body posture, and job dissatisfaction also identified as risk factors for low back pain (45). Working more than 9 hours per day, high BMI, and workload of greater than 6 classes per day were reported as risk factor for low back pain by study conducted in Philippines (46). A study in Iran reported, teaching for greater than 20years, prolonged sitting, prolonged standing, and prolonged working hour as predictors of low back pain (37).

A study in Egypt reported that there is significant association between number of students per class room (>35 students), number of class taught per week (>20 classes), prolonged static head down position, long hour standing, lack of supervisor's psychological support and low back pain (48). Age greater than 30-year, working continuously for greater than 4 hours, inadequate ergonomic condition at work, and greater than 10km distance of home to institution were significantly associated with low back pain (47).

According to study done in Ethiopia, earning above 5305 ETB, standing for the long time, sleep disturbance, cigarette smoking, lifting heavy load, and psychological job demand were increased risk of low back pain. Whereas, being unmarried and no regular exercise were identified as substantially less likely to develop low back pain (11).

2.3 Conceptual frame work

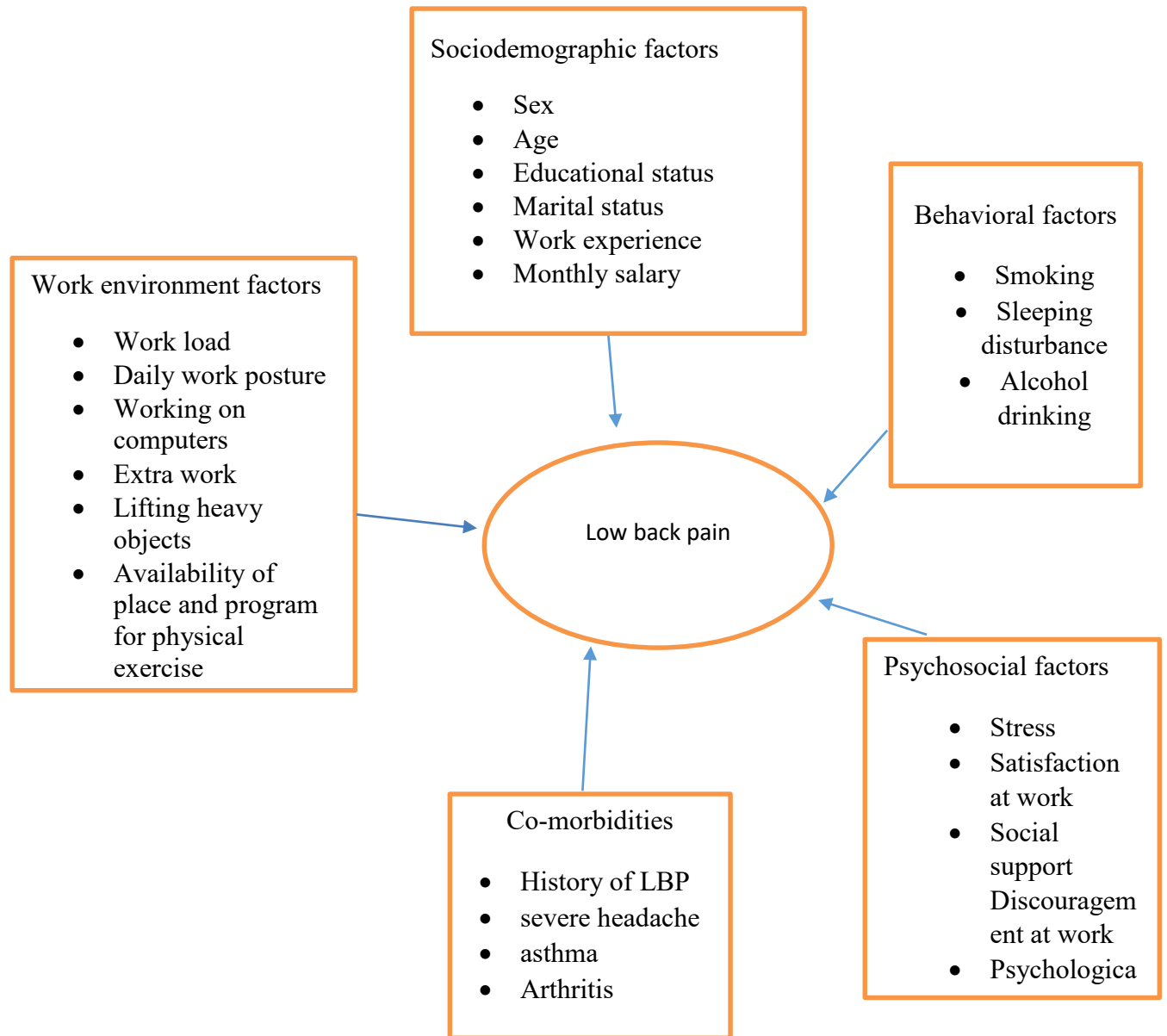


Figure 1 conceptual framework among teachers in Asella town January 2025 (from different literatures)

3. OBJECTIVES

3.1 General objective

- ✚ To assess the magnitude of low back pain and associated factors among teachers in Asella town, Oromia, Ethiopia from April to May 2025

3.2 Specific objectives

- To determine the magnitude of low back pain among teachers in Asella town from April to May 2025
- To determine factors associated with low back pain among teachers in Asella town from April to May 2025

4. MATERIALS AND METHODS

4.1. Study area

Asella is a town in central Ethiopia, located in the Oromia Region. It is the administrative center of the Arsi Zone. The town is located about 175 kilometers southeast of Addis Ababa, the capital of Ethiopia. There are 12 high schools (08 government and 04 private) and 33 elementary schools (11 government and 22 private).

4.2 Study design and period

A cross-sectional study was conducted within institutions from April to May 2025.

4.3 Population

4.3.1 Source of population

All teachers in Asella town, Arsi, Oromia, Ethiopia from April to May 2025.

4.3.2 Study population

Teachers in selected schools in Asella town, Arsi, Oromia, Ethiopia from April to May 2025.

4.4 Inclusion and Exclusion criteria

4.4.1 Inclusion criteria

- Teachers who have been working for at least 1 year.

4.4.2 Exclusion criteria

- Teachers with acute back pain due to a recent injury or accident.
- Teachers with known medical conditions that could cause back pain (e.g., spinal stenosis, rheumatoid arthritis).
- Teachers who are pregnant (due to potential physiological changes).

4.5 Study variable

4.5.1 Dependent variable

- Low Back Pain (LBP)

4.5.2 Independent Variable

- **Socio-demographic factors:** Sex, Age, Educational status, Marital status, Work experience, Monthly salary
- **Work environment factors:** Workload, Daily work posture, working on computers, Extra work, Lifting heavy objects, Availability of place and program for physical exercise
- **Behavioral factors:** Smoking, Sleeping disturbance, Alcohol drinking
- **Psychosocial factors:** Satisfaction at work, social support, Discouragement at work, psychological work demand, Co-morbidities, Previous back trauma

4.6 Sample size calculation and sampling Technique

4.6.1 Sample size calculation

To determine the appropriate sample size (n) for the study I utilize the formula $n = (Z^2 * p * q) / d^2$. Here, Z represents the Z-score corresponding to the desired confidence level, which is 1.96 for a 95% confidence level. The estimated proportion (p) of the study conducted in Mekelle Ethiopia (10) 0.748, and q is calculated as 1 - p, resulting in 0.252. Finally, d represents the desired margin of error, expressed as a decimal; for example, a 5% margin of error would be represented as d = 0.05.

Calculation:

Assuming a 5% margin of error (d = 0.05):

$$n = (1.96^2 * 0.748 * 0.252) / 0.05^2 \quad n = (3.8416 * 0.188496) / 0.0025 \quad n = 0.7246 / 0.0025 \quad n \approx 289.84$$

Therefore, the required sample size is approximately 290. with 10% non-response rate a total of 319 sample size will be used

Sample size calculation using factors

Table 1:- sample size calculation using factors

S/ N	Variables	Factors associated with chronic low back pain		AOR	Sample size	Reference
		Non-exposed (P1)	Exposed (P2)			
1	Sex (male)	46.4%	28.5%	1.83	250	(52)
2	No back support sitting chair	50.2%	31.6%	2.8	140	
3	Stress	55.9 %	33.2%	2.6	160	
4	>or = daily work 6 hours	65.2%	34.2	4.33	74	

By comparing the first and second objectives the maximum sample size of 319 were used for final sample size.

4.6.2 Sampling Technique and sampling procedure

There are a total of 1684 teachers in Asella town, with 1325 employed by the government and 359 employed privately. A sample size of 319 teachers has been determined for the study.

To ensure proportional representation of both government and private school teachers in the sample, stratified sampling was used. The allocation is calculated as follows:

Government school teachers: $(319 / 1684) * 1325 =$ approximately 251 teachers

Private school teachers: $(319 / 1684) * 359 =$ approximately 68 teachers

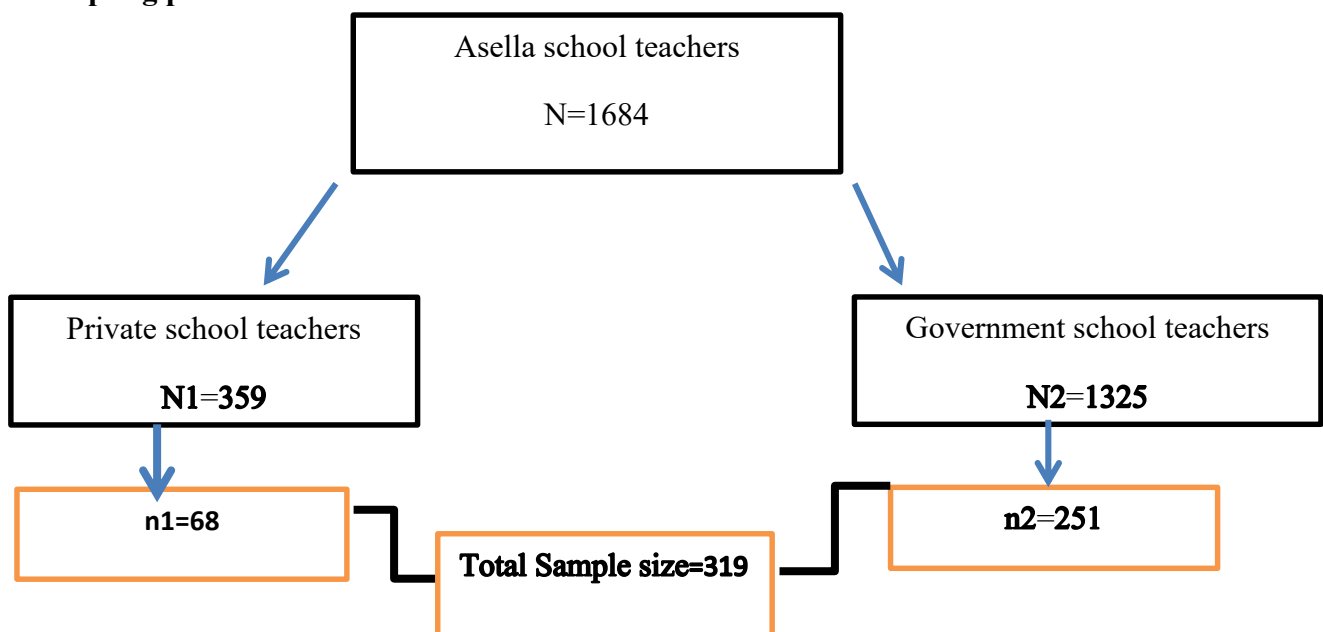
This means that approximately 251 teachers were selected from government schools and 68 teachers were selected from private schools to participate in the study, totaling the desired sample size of 319.

The sampling technique was $1684/319 =$ every five teachers the data was collected suggests a systematic sampling approach will be used.

Sampling Procedure

First, all schools in Asella town were included in the sampling frame. A proportional allocation was then applied to determine the number of participants to be selected from each school based on its teacher's population size. Finally, within each selected school, study participants were chosen using a simple random sampling method to ensure fairness and representativeness.

Sampling procedure:



4.7. Data collection Procedure

Three trained data collectors, BSc nurses were selected to undergo the data collection activities. Training was given for data collectors and a supervisor for one day on method of extracting the needed information, how to fill the information on a structured questionnaire and the ethical aspect in approaching the participants.

4.8 Data Analysis Plan

Data analysis involves both descriptive and analytical statistics. After data is collected by kobo toolbox, the data was cleaned and exported to Excel which is then imported and analyzed by SPSS version 26 software. Descriptive statistics were used to calculate the magnitude of low back pain and to describe the characteristics of the study population, including age, sex, teaching experience, and other relevant demographic and occupational variables. The prevalence of associated factors, such as workload, physical activity levels, and psychosocial factors, was also summarized. For analytical statistics, appropriate statistical tests, including frequencies, cross tabulations and logistic regressions, were employed to assess the associations between chronic low back pain and potential risk factors. Odds ratios (OR) with 95% confidence intervals (CIs) will be calculated to quantify the strength of these associations. Finally, multivariate analysis was conducted to control for potential confounding factors and to determine the independent effects of the risk factors on chronic low back pain.

4.9. Data Quality Control

To ensure high data quality, several measures were implemented throughout the study. During questionnaire development, a standardized instrument for assessing low back pain were utilized. The questionnaire was translated into the Afan Oromo language, followed by back-translation to confirm accuracy and maintain the original meaning. A pilot test of the questionnaire was conducted to identify and address any potential ambiguities or comprehension issues before full data collection begins. For data collection itself, data collectors were undergoing thorough training on the study protocol and standardized data collection methods. Supervision of data collection activities were done to minimize errors and ensure consistency. Finally, during data entry and cleaning, a pre-designed data entry form or database was employed to reduce data entry errors. Subsequent data cleaning and validation procedures were performed to identify and rectify any inconsistencies or missing data, further enhancing the overall quality of the dataset.

4.10 Ethical considerations

This study was conducted with adherence to ethical guidelines. Prior to commencing data collection, ethical approval was sought from the relevant ethical review boards or committees at Arsi University. Furthermore, informed consent was obtained from each participant after

thoroughly explaining the study's purpose, procedures, potential risks and benefits, and their right to withdraw at any time without consequence. Throughout the study, the confidentiality and anonymity of participants' data will be meticulously maintained. All data collected were stored securely and accessed only by authorized personnel.

4.11 Operational definition

low back pain (LBP): self-reported pain, discomfort, or stiffness localized between the lower margin of the 12th rib and the gluteal folds, experienced at least once in the past 12 months. The severity of pain was assessed using a Visual Analog Scale illustrated with pictures, and a positive history of low back pain were classified as having low back pain.

Body mass index: weight in kilograms divided by the square of the height in meters (kg/m^2). Underweight= BMI < 18.50, Normal range = BMI b/n 18.50- 24.99, Overweight = BMI b/n 25.00–29.99, and Obese = BMI > 30.00

Cigarette smoking: It is a practice of smoking cigarette by teachers for at least one sticks of cigarette per day

Alcohol drinking: it is a consumption of any kind of alcohol by teachers at least for two times per week

Physical exercise: Performing any kinds of physical exercise at least two times per week and for 30 min

Prolonged Standing: Standing for more than six hours continuously during a typical workday.

5. RESULT

5.1 prevalence of low back pain among teachers

5.1.1 Socio demographic characteristics of teachers

A total of 319 participants were included in a study assessing the occurrence of low back pain (LBP). Overall, 46.4% reported experiencing LBP. Females reported a higher magnitude (55.6%). Age-wise, participants over 40 made up the largest group (43.6%), but the highest proportion of LBP sufferers was in the 30–40 age group (52.3%), with the lowest in those under 30 (26.2%). Religiously, most participants were Christians (71.8%) or Muslims (27.9%), with LBP occurrence similar between the two groups (46.7% vs. 46.1%).

Education levels showed relatively consistent LBP rates across categories, though Certificate holders (n=5) had the highest proportion (60%). Most participants were married (85.6%), and while they had the highest number of LBP cases, the divorced group had the highest proportion (57.1%). Work experience appeared influential: 52.1% of those with over 10 years of experience reported LBP compared to 29.1% with less, pointing to a potential cumulative work strain effect.

Table 2 Socio-Demographic Characteristics of LBP among teachers in Asella town, Oromia, Ethiopia, 2017 (N= 319)

VARIABLE		N	Percent %
Sex	Male	177	55.5%
	Female	142	44.5
Age	< 30	61	21.6%
	30-40	111	34.8
	>40	139	43.6
Religion	Christian	229	71.8%
	Muslim	89	27.9
Educational level	BA or BSc	198	62.1%
	Certificate	5	1.6%
	Diploma	60	18.8
	Master Degree	56	17.6
Marital status	Divorced and widowed	9	2.8
	Married	273	85.6
	Single	37	11.6
Work experience	<10 years	79	24.8%
	>10 years	240	75.2
BMI	Under weight	16	5%
	Normal	234	73.4%
	Overweight	64	20.1%
	Obese	5	1.6%

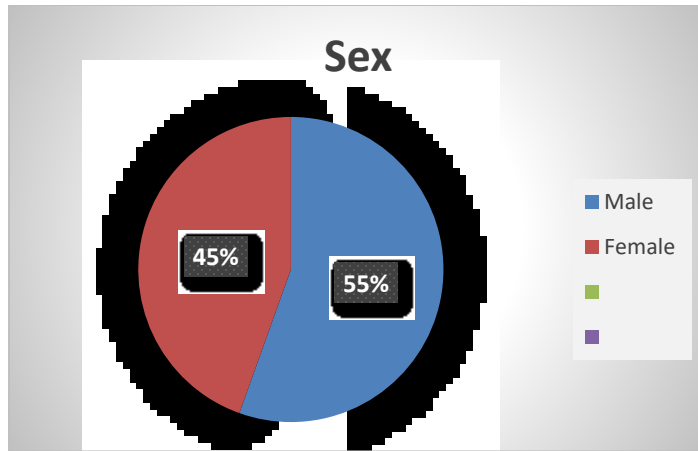


Figure 2 Sex among teachers in Asella town, Oromia, Ethiopia, 2017 (N= 319)

5.2 Low back pain Magnitude among teachers

In a study examining the magnitude and awareness of low back pain, 46.4% (148) of participants reported experiencing low back pain. Among those who reported having low back pain, 89.8% (133) were aware of its occurrence, The most commonly identified contributing factor was prolonged standing, reported by 43.6% of respondents. This was followed by a combination of prolonged standing and lifting heavy loads (36.8%). A smaller proportion of respondents indicated prolonged sitting combined with prolonged standing (9.8%), while other specific causes accounted for 6.8%. Prolonged sitting alone was the least frequently reported factor, representing 3% of responses.

Regarding the prevalence of low back pain, only 12.8% (n = 19) of respondents reported experiencing low back pain within the past twelve months. In contrast, the majority, 87.2% (n = 129), reported no occurrence of low back pain during the same period.

Table 3 low back pain Magnitude among teachers in Asella town, Oromia, Ethiopia, 2017 (N= 319)

Variables		N	Percent %
low back pain magnitude	Yes	148	46.4
	No	171	53.6
Knew occurrence of low back pain	Yes	133	89.8
	no	15	10.2
Prolonged sitting	yes	4	3

	Prolonged sitting and prolonged standing	yes	13	9.8
	Prolonged standing	yes	58	43.6
	Prolonged standing and lifting heavy loads	yes	49	36.8
	Other, specific	yes	9	6.8
	Low back pain in the past twelve months	Yes		
		No		

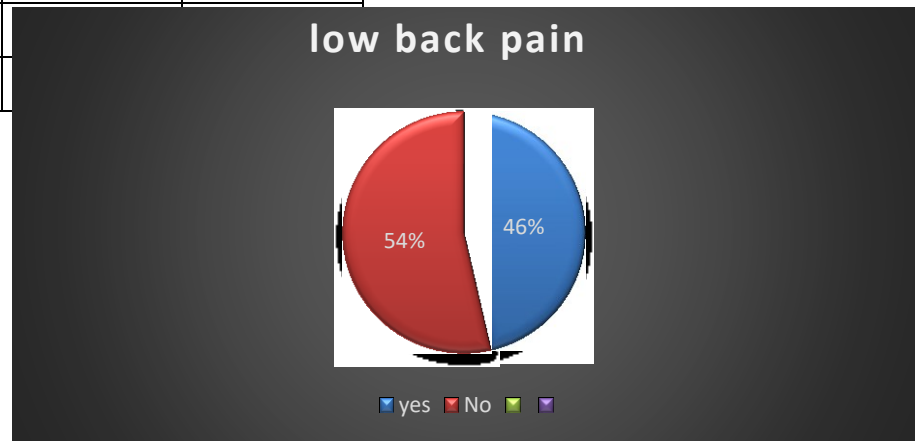


Figure 3 low back pain magnitude among teachers in Asella town, Oromia, Ethiopia, 2017 (N= 319)

5.3 Working environment characteristics

A large majority of respondents (138) reported prolonged standing during teaching, while 112 indicated exposure to prolonged sitting, highlighting the physical strain involved in their roles. Only 22 respondents have an office, and among them, most have access to a chair and table, with a high proportion noting that the furniture is suited to their height suggesting relatively good ergonomic support for this small group. Teaching aids are widely used, as reported by 143 individuals, showing a strong reliance on instructional tools. While the majority (265) indicated they do not engage in extra work beyond institutional requirements, 54 reported having additional responsibilities.

Table 4. Working environment characteristics of teachers in Asella town, Oromia, Ethiopia, 2017 (N= 319)

VARIABLE		YES	NO
Prolonged standing during teaching		138 (93.2)	10 (6.8)
Have office		22 (14.9)	126 (85.1)
	Have chair and table in the office	21 (95.5)	1 (4.5)
	Chair suited per your height	20 (95.3)	1 (4.7)
	Table suited per your height	18 (85.7)	3 (14.3)
Exposed to prolonged sitting		112 (75.7)	36 (24.3)
Teaching Aid		143 (96.6)	5 (3.4)
Extra work than their institution		54 (16.9)	265 (83.1)
Ventilation problem at working class		84 (56.8)	64 (43.2)
Low lighting problem at working class		62 (41.9)	86 (58.1)
Noise problem at working class		34 (23)	114 (77)
High thermal problem at working class		11 (7.5)	137 (92.5)

5.4 Psychosocial characteristics

A large majority of respondents expressed satisfaction with the working environment and culture (134 Yes vs. 14 No) and reported feeling happy at work (135 Yes vs. 13 No). Most employees also indicated that they have a good relationship with their boss (144 Yes vs. 4 No) and feel supported at work (142 Yes vs. 6 No). In terms of emotional well-being, the results are positive, with only 36 respondents reporting feeling stressed, while 112 do not. Similarly, only 45 individuals reported getting irritated or angry at others, whereas 103 said they do not experience such feelings.

Table 5 Psychosocial characteristics of teachers in Asella town, Oromia, Ethiopia, 2017 (N= 319)

VARIABLE	YES	NO
Satisfaction with working environment and culture	134 (90.5)	14 (9.5)
Do you feel happy at work	135 (91.2)	13 (8.8)
Do you feel stressed	36 (24.3)	112 (75.7)
Do you have good r/ship with your boss	144 (97.3)	4 (2.7)
Do you feel you get support at our work	142 (95.9)	6 (4.1)
Do you get irritated or angry at other persons	45 (30.4)	103 (69.6)

5.5 co-morbidity characteristics of teachers

Out of the total participants, 51 reported experiencing recurrent severe headaches. Among those surveyed, 35 individuals indicated that they feel lower back pain (LBP) during headaches. Regarding respiratory conditions, 12 individuals reported having asthmatic problems, and 136 did not. Of those with asthma, 9 reported experiencing LBP during asthmatic episodes. Additionally, the presence of other chronic diseases was noted: 9 individuals had hypertension, 2 had heart disease, and 3 were diagnosed with diabetes mellitus.

Table 6. co-morbidity characteristics of teachers in Asella town, Oromia, Ethiopia, 2014 (N= 319)

variable			N (%)
Recurrent severe headache		Yes	51 (37.5)
		No	85 (62.5)
	Feel LBP during headache	Yes	35 (23.6)
		No	113 (76.4)
Asthmatic problem		Yes	12 (8.1)
		No	136 (91.9)
	Feel LBP during asthmatic	Yes	9 (75)
		No	3 (25)
Other disease (hypertensive, diabetes Miletus, heart disease...)		Hypertensive	9 (64.3)
		Heart disease	2 (14.3)
		Diabetes Miletus	3 (21.4)

5.6 Behavioral characteristics of teachers

A very small proportion of participants reported engaging in smoking (1.4%), khat chewing (3.4%), and alcohol drinking (2.7%), indicating low prevalence of these substance use behaviors. In contrast, a notable portion (15.5%) reported experiencing sleeping disturbances. When it comes to physical activity, 45.9% of the participants reported doing regular physical exercise, while the majority (54.1%) did not engage in regular exercise.

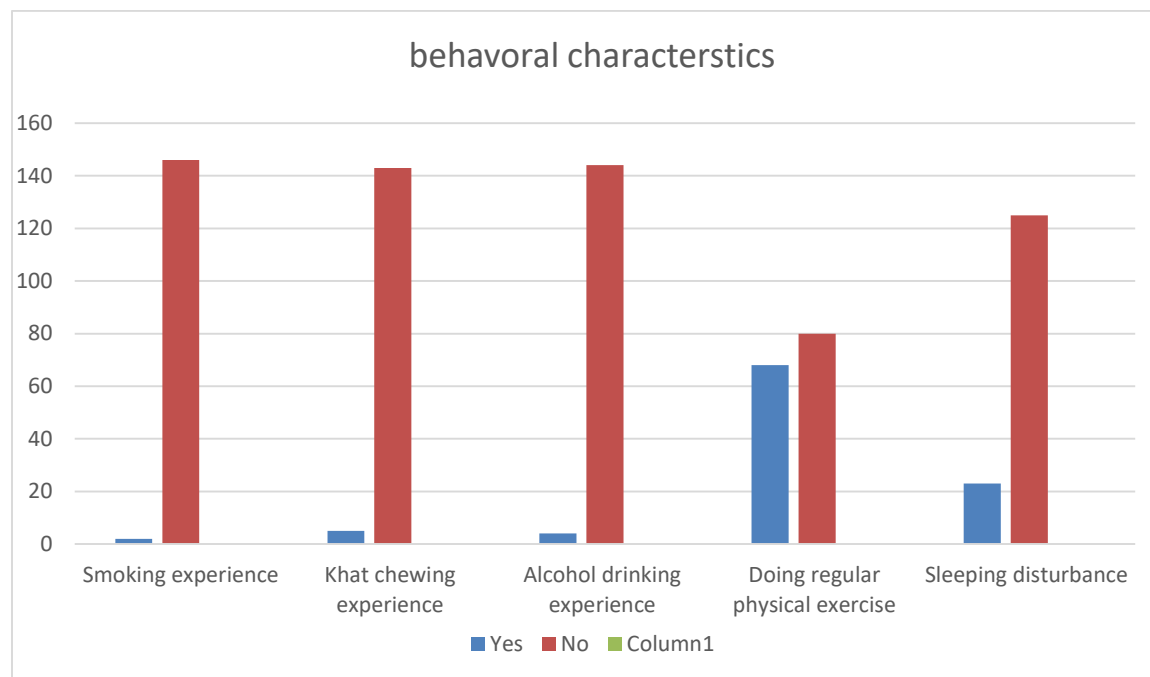


Figure 4 Behavioral characteristics of teachers in Asella town, Oromia, Ethiopia, 2017 (N= 319)

5.2 Factors associated with low back pain

In the bivariate analysis are, sex, Age, School type, sleeping disturbance, lifting Heavy materials, smoking experience, work shift and work experience are candidate variables for multi variable analysis. School type showed that individuals working in public schools had a higher prevalence of low back pain (77.7%) compared to those in private schools (22.3%). For work shift, the morning shift was associated with a lower likelihood of low back pain, while those working both shifts had compared to the afternoon shift as the reference. Lastly, work experience demonstrated a strong association: those with over 10 years of experience had significantly higher odds of low back pain (84.5%) compared to those with less than 10 years (15.5%), suggesting that prolonged work duration may contribute to low back pain risk.

The multivariable analysis also shows sex, age group, Work shift and work experience are associated with low back pain. Regarding sex, Female teachers had **2.12 times higher odds** of experiencing low back pain compared to male teachers (AOR = 2.12, 95% CI: 1.47 to 3.82). Teachers aged 30-40 years had **18.6 % Higher odds** of low back pain compared to teachers under 30, and this was a **statistically significant** association (AOR = 0.19, 95% CI: 0.10 to 0.39). While teachers older than 40 years (>40 vs. <30)) had **82.3% Higher odds** of low back pain compared to teachers under 30. **Work shift** demonstrated a significant association only for those working both morning and afternoon shifts. Participants working **both shifts** were less likely to experience low back pain compared to those working afternoon shifts only (AOR = 0.55; 95% CI: 0.40–1.13; $p = 0.03$).

Work experience was significantly associated with low back pain. Participants with **more than 10 years of work experience** were **more likely** to report low back pain compared to those with less than 10 years of experience (AOR = 0.40; 95% CI: 0.22–0.65; $p = 0.001$).

Table 7. Factors associated with low back pain among teachers in Asella town, Oromia, Ethiopia, 2017 (N= 319)

Variable		Low back pain						
		Yes	No	COR	AOR	P-Value	95% CI for COR	95% CI for AOR
Sex	Male	69 (46.6)	108 (63.1)	1	1		1	
	Female	79 (53.4)	63 (36.9)	1.963	2.119	0.004	1.254 – 3.073	1.467- 3.82
Age	< 30	15 (10.2)	54 (31.6)	1	1		1	1
	30-40	59 (39.8)	52 (30.4)	0.244	0.186	0.004	0.136 – 0.498	0.097- 0.388
	>40	74 (50)	65 (38)	0.997	0.823	0.001	0.594 – 1.617	0.490- 1.394
School Type	Private	33 (22.3)	60 (35.1)	1	1		1	1
	Pubic	115 (77.7)	111 (64.9)	0.531	0.635	0.221	0.322- 0.874	0.322- 0.874
Work shift	Afternoon	49 (33.1)	60 (35.1)	1	1		1	1
	Both	33 (22.3)	57 (33.3)	0.668	0.545	0.03	0.397- 1.125	0.397- 1.125
	Morning	66 (44.6)	54 (31.6)	0.474	0.670	0.278	0.271- 1.125	0.271- 1.125

							0.829	0.829
Work experience	<10 years	23 (15.5)	56 (32.7)	1	1		1	1
	>10 years	125 (84.5)	115 (37.3)	0.378	0.395	0.001	0.219-0.653	0.219-0.653

Discussion

In this study, the Magnitude of LBP among school teachers was found to be 46.4% with 95%CI (40.8–51.7%), which was in line with study done in China (46%) 39. and 47% in European union (53).

However, the finding of the present study was lower than studies conducted in Saudi Arabia (67.6%) 54, Bangladesh (63.3%) 55, France (72%) 56, Gondar (55.6%) 57 and Egypt (73.1%) 58. This variation might be due to differences in the methodology, definition of LBP used in each study, sample size, awareness and openness to the questions, individual perception of pain and differences in assessment tools.

On another hand, it was higher than studies conducted in Pakistan (21.2%) 59 and Saudi Arabia (30%) 60. The possible reason might be due to poor health facilities and socioeconomic differences.

The corrected logistic odds ratio of this study showed that female teachers were 2.11 times more likely to experience low back pain compared to males' teachers (95% CI: 1.467- 3.82). Similar findings have also been found in a study of Turkish (61) teachers where females reported more severe pain than their male and this fact was in line with other international data from Tanzania (62), Malaysia (63), Keniya (64), and Botswana (49). The possible reasons of this independent association were firstly the difference between males and females in terms of practicing physical regular exercise, indeed, apart from teaching and other school activities, women were also called to do many domestic households after work.

The association of Age with LBP was an independent factor found in studies, which was in line with previous studies conducted in Brazil (65), Chaina (39) and Cameron (66). Age was largely known as an associated factor with musculoskeletal disorders. Senior teachers may face a higher risk of lower back pain due to heavier responsibilities like supervision and exam preparation. Age-related declines in muscle tone and bone strength could also contribute to this issue.

Regarding the work shift Several studies support the association between work shift and low back pain. A study conducted among teachers in Malaysia (63) and Nigeria (50) among secondary school teachers found that teachers working **long or continuous shifts** experienced a higher prevalence of low back pain compared to, those with more flexible schedules. Possible reason is extended shifts may contribute to physical fatigue, prolonged standing, and reduced recovery time, which are known risk factors for low back pain.

Regarding the work experience the current finding in line with reports from studies conducted in **Saudi Arabia (60), Iran, Turkey (61), and China (39)**, where longer work experience was associated with a higher risk of LBP. Possible explanation is prolonged exposure over many years may increase the likelihood of developing LBP.

Conclusion

Overall, the study revealed that low back pain (LBP) is relatively prevalent among teachers in Asella Town, with rates similar to those reported in other countries. Logistic regression analysis identified numerous risk factors for LBP, indicating that its causes are diverse and multifaceted. Both being female and belonging to certain age groups were found to be significantly Associated to the occurrence of LBP.

Recommendation

The diverse range of risk factors for low back pain (LBP) identified in this study indicates that no single preventive or intervention strategy is likely to be effective on its own. Therefore, to lower the prevalence, development, and impact of LBP among teachers in Asella Town schools, more attention should be given to consistent physical activity, and managing occupational stress.

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Annexes

Annexe-1

Consent Form for Self-Administered Questionnaire

Title of Study: Prevalence of Chronic Low Back Pain and Associated Factors Among Teachers in Asella Town, Oromia, Ethiopia, 2025 G.C: Cross sectional study

Name of Principal Investigator: Tewdros Tamiru (MD, FCS-ECSA, FACS).

Greetings!

Hello!

Dear respondents my name is _____ and I am working as a data collector for the study being conducted

Introduction and Purpose:

You are invited to participate in a research study aimed at understanding the prevalence of chronic low back pain and identifying factors associated with this condition among teachers in Asella Town. This study seeks to gather information that may contribute to improving health interventions and workplace support for educators. Your participation involves completing a self-administered questionnaire, and your honest responses are invaluable to the success of this research.

Procedures:

By agreeing to participate, you will answer questions about your health history, work environment, lifestyle habits, and experiences related to low back pain. The questionnaire will take approximately 15–20 minutes to complete. Participation is entirely voluntary, and you may skip any questions you find uncomfortable or withdraw from the study at any time without penalty or consequence.

Risks and Benefits:

There are no direct physical risks associated with participating in this study. However, some questions may relate to personal health experiences, which could cause temporary discomfort. All responses will remain confidential. The primary benefit of your participation is the potential to inform policies and programs aimed at reducing chronic low back pain among teachers and improving occupational health conditions in Asella Town.

Confidentiality:

Your responses will be kept strictly confidential. No personally identifiable information (e.g., name, address) will be collected, and data will be anonymized before analysis. All information will be stored securely in password-protected files and accessible only to the research team. Results will be reported in aggregate form to ensure individual anonymity.

Voluntary Participation:

Your decision to participate, decline, or withdraw at any stage will not affect your employment, rights, or relationships in any way. If you choose to withdraw, your data will be immediately discarded and excluded from analysis.

Contact Information:

For questions about the study, contact Dr.Tewodros Tamiru at:

Email-bethelmehana@gmail.com, Mobile No.-+251911980627

Thank you in advance for your cooperation!

Annex 2

Questionnaire

Sociodemographic and economic characteristics among teachers

SN	Variables		
1	Sex	Male	
		Female	
2	School type	Private school	
		Public school	
3	Height		
	Weight		
4	Age (in years)	<30	
		31-40	
		Above 40	
5	Body mass index	Less than 18.5	
		18.5-24.9	
		25-29.9	
		≥ 30	
4	Religion	Orthodox	
		Muslim	
		Protestant	
		Catholic	
5	Educational status	Certificate	
		Diploma	
		Degree and above	
6	Marital status	Single	
		Married	
		Divorced/widowed	
7	Work experience (in years)	<10	
		≥ 10	

	Field of study	English	
		Language	
		Mathematics	
		Natural Science	
		Social Science	
		Physical education	
8	Monthly salary (ETB)	>3501	
		2501-3500	
		<2500	
9	Have extra source of income	No	
		Yes	

Work-related characteristics of among teachers

	Variables		
1	Have LBP for more than 12 weeks	Yes	
		No	
2	Prolonged standing during teaching	Yes	
		No	
3	Occurrence of low back pain	While standing	
		While sitting	
		While sleeping	
		While walking	
		Others, specify	
4	Do you know the cause of your back pain	Prolonged standing	
		Prolonged sitting	
		Lifting heavy loads	
		Injury in the lower back	

		Sitting and doing work on computers	
		Others, specify	
3	Length of standing during teaching per session	2-5 hours	
		More than 5 hours	
4	Frequency of teaching class	One class per week	
		Moving from class to class	
5	Length of break time between sessions	Less than 20 minutes	
		Up to 1 hour	
		More than 1 hour	
6	Working hours per week	<30 hours	
		≥30 hours	
7	Sleeping time per day	<6	
		6-9	
		≥10	
8	Sleeping disturbance	Yes	
		No	
9	Have prolonged sitting	Yes	
		No	
10	Reasons of prolonged sitting at work	For exam marking	
		For assignment marking	
		Other reasons	
11	Type of seat frequently used at office	Swivel chair	
		Normal chair	
		Bench	
12	Work shift pattern	Morning	
		Afternoon	
		Both	
13	Have separate office	Yes	
		No	
14	Shifting heavy materials	Yes	

		No	
15	Have extracurricular activity	Yes	
		No	
16	Have regular physical exercise	Yes	
		No	
17	Time for physical exercise per week (in hours)	≤ 5	
		> 5	
18	Have training on safety at work	Yes	
		No	
19	Satisfaction with working environment	Yes	
		No	
20	Have discouragement and depression	Yes	
		No	
21	Experience of any verbal or physical violence	Yes	
		No	

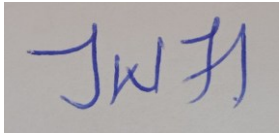
Comorbidity- and psychosocial-related characteristics of among teachers

	Variables	YES	NO
1	History of LBP		
2	Have stress		
3	Recurrent severe headache		
4	Feeling LBP during headache		
5	Have asthma		
6	Feeling LBP during asthma		

Declaration of Investigator

I, the undersigned student of the Master of Public Health program, declare that this thesis is my original work, submitted in partial fulfillment of the requirements for the degree of Master of Public Health in General Public Health, to the best of my knowledge.

Name of investigator: Tewodros Tamiru(MD,FCSECSA,FACS)

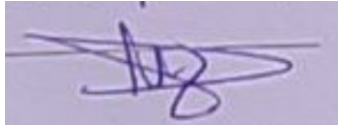
Signature: _____


Date _____23/9/2025_____

Declaration of Advisors

We, the undersigned, hereby declare that we have carefully reviewed this thesis and provided guidance for its preparation. We confirm that this thesis paper is ready for defense with our approval as the university advisor(s), and to the best of our knowledge, the work presented meets the academic standards and is in partial fulfillment of the requirements for the degree of Master of Public Health in General Public Health.

1. Name of Principal Advisor: Mr. Dejene Seyoum (MPH, Assistant Professor)

Signature: _____


Date: _____23/09/25_____

2. Name of Co-Advisor: Mr.Muhammed awol Kaso (MPH, Associate professor)

Signature: _____ 

Date: _____

Examiners' Declaration

We, the undersigned examiners, hereby declare that we have thoroughly examined the paper presented for the degree of Master of Public Health in General Public Health. After careful review and defense of the thesis paper, we confirm that it meets the academic standards and requirements of the university. We hereby approve the proposal and consent to the student proceeding with the next steps toward completing the full thesis, which is required for the award of the degree.

Name of Examiner 1: _____

Signature: _____

Date: _____

Name of Examiner 2: _____

Signature: _____

Date: _____