



INSTITUTE OF MEDICINE AND HEALTH SCIENCES, COLLEGE OF
HEALTH SCIENCES, DEPARTMENT OF PUBLIC HEALTH

PREVALENCE OF OCCUPATIONAL-INJURIES AND ASSOCIATED
FACTORS AMONG MICRO AND SMALL-SCALE WOOD AND
METALWORKING INDUSTRY WORKERS IN DEBRE BERHAN TOWN,
ETHIOPIA, 2020.

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DEBRE BERHAN UNIVERSITY, COLLEGE OF HEALTH SCIENCES
DEPARTMENT OF PUBLIC HEALTH

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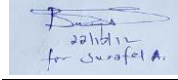
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Acronyms and Abbreviations

AOR: -Adjusted Odds Ratio

CI: -Confidence Interval

COR:-Crude Odds Ratio

DC:-Data Collector

ETB:-Ethiopia Birr

GDP:-Gross Domestic Product

ILO:-International Labor Organization

MSE:-Micro and Small scales enterprise

MSI:-Micro scale industry

OSH:-Occupational Safety and Health

PI:-Principal Investigator

PPE:-Personal Protective Equipment

SDG:-Sustainable Development Goal

SSI:-Small Scale Industry

SPSS:-Statistical Package for the social sciences

WHO:-World Health Organization

Abstract

Introduction: In Ethiopia as a mechanism for alleviating unemployment and accelerating development special attention has given to the development of micro and Small-scale enterprises. But studies revealed that workers were highly exposed to occupational-injuries and little is known specifically in the wood and metalworking sectors. Therefore, the aim of this study was to assess the prevalence and associated factors of occupational-injury among micro and small-scale wood and metalworking industry workers in Debre Berhan town, North- East, Ethiopia 2020.

Methods: An institutional-based cross-sectional study was conducted from February, 20 to March, 10, 2020. A cluster sampling technique was used to select 727 study participants. Data were collected using a structured questionnaire and observational checklist through face to face interviews and observation. Data were entered into Epi-Data V.3.1 and exported to SPSS-V. 21 for analysis. Descriptive statistics were computed. Binary logistic regression analysis was carried out to identify candidate variables for multivariable analysis and independent variables with $p < 0.25$ were entered into multivariable analysis (backward stepwise procedure) to control-confounders and P-value < 0.05 at 95% CI was used to declare significance.

Result. The prevalence of occupational-injury was 39.3% (95%CI:35.7,42.7).Lack of workplacesupervision(AOR=1.696;95%CI:1.211,2.374),unguardedmachine(AOR=1.705;95%CI:1.196,2.430),cigarette smoking (AOR=2.565;95%CI:1.787,3.683),not using Personal ProtectiveEquipment(AOR=1.667;95%CI:1.078,2.557),alcoholconsumption(AOR=2.473;95%CI:1.584,3.860)andpoor safety practice(AOR=2.201;95%CI:1.316-3.680)were significantly associated with occupational-injuries.

Conclusion and recommendation. The prevalence of occupational-injury in this study was relatively high. Lack of workplace supervision, alcohol consumption, smoking cigarette, not using personal protective equipment, unguarded machine, and poor safety practice increase the risk of occupational-injury. Therefore, preventive measures like Behavioral change communication of workers, workplace supervision, guarding of machines, and use of personal protective equipment can play an important role in reducing occupational-injury.

Keywords: Occupational-injury; prevalence; associated factors; micro and small-scale industryworkers;DebreBerhan,Ethiopia

1. Introduction

1.1. Background

Occupational-injury is any personal injury resulting from an occupational accident sustained on workers in relation to the performance of his or her work(1). Millions of employees all over the world are employed today in conditions that breed ill health (2). Virtually, no work is free from hazards but the informal micro and small-scale industries obviously have a disproportionate share(3). Being aware of the role of the micro and small-enterprises in inspiring employment creation, capital formation, and economic development, many developing countries have given due attention to the development of micro and small enterprises(4). However, the job security is poor that results in occupational-injury and disease(5).

Work-related injuries remain a global public health burden in terms of disability-adjusted life years, which contributed to 1.5% of all causes(6). Globally about 374 million accidents, 2.78 million deaths occur each year, 6,000 deaths, every single day, and 4 % loss of the world's Gross domestic product (GDP) due to occupational injury(7,8). Of the total workers in the world, nearly 85% of workers are economically active in micro and small-scale industries without occupational safety due to this occupational injury appear to be rising especially in developing countries. In sub-Saharan Africa 54,000 fatal occupational accidents and 42 million work-related accidents that cause at least 3 days absences from work happen annually(9).

Safety and health problems are major challenges in Ethiopia because of low occupational hazards awareness and inefficient safety management system(10). As a mechanism for alleviating unemployment, lifting people out of poverty, and accelerating development the Ethiopian government has given special attention to the expansion of Micro and Small enterprises (MSEs)(11). But workers employed in MSEs perform their duties under sub-optimal working conditions causing occupational-injury(12,13). Micro and small-scale enterprises particularly metalworking and woodworking industries are among the highest-ranked industries in terms of risks for occupational-injuries (14,15)

1.2. Statements of the problem

Globally, about millions of peoples are working within the informal micro and small-scale industries under risky environments, because of these occupational injuries and diseases still be the leading reason behind work-related deaths in both the developed and developing nations (16–18). In developing countries, the burden is 10 to 20 times higher as compared to developed countries(19). Several studies reported a higher prevalence of occupational injuries within the micro and small-scale enterprises. Studies conducted within the manufacturing sectors in Bangladesh (60.37%), India (44%), Nigeria(85.7%) and in Ethiopia, in Bale zone(30%),Mizan Aman town (45.2%),Arba Minch town(80.8%) and Mekelle city(58.2%) (14,20–25) revealed that workers are highly predisposed to occupational-injury in this sector.

Nowadays, workplace safety is considered by World Health Organization (WHO) a priority setting for health promotion within the 21st century(16). Safety and health at work can be key to sustainable development, and investment in OSH can help contribute to the achievement of the 2030 Agenda for Sustainable Development, and particularly to the achievement of Sustainable Development Goal (SDG) 3, to ensure healthy lives and promote well-being for all at all ages and SDG 8, to promote inclusive and sustainable economic growth, employment and decent work for all, and Target 8.8, to protect labor rights and promote safe and secure working environments for all workers(26)

In Ethiopia, micro and small-scale enterprises(MSEs) are classified into micro scale and small-scale enterprises based on their number of employees, being less than 6 and 6–30, respectively(27). It is an informal economy sector in which access to occupational health services and injury recording and notification were greatly compromised (10). The machineries used and the working environments in the wood and metalworking activities are very hazardous that will cause serious occupational-injuries(28).

Studies showed that socio-demographic factors like, age(24,29,30),educational level (30–32),monthly salary(19),work experience(30) ,job category(30,33),Behavioral factors such as cigarette smoking(25,33,34),sleeping problems (35),alcohol consumption(30), non-use of personal protective equipment (PPEs)(17) and job dissatisfaction(36) and environmental factors consists of working for more than 48 hours/week (14,25,37), absence of health and safety training (30,38–40),were contributing factors for occupational-injury.

Most of the studies were conducted within the general (MSE) manufacturing sectors(23–25,29,30,41)but little is known specifically in the wood and metalworking sectors and former

studies in Ethiopia didn't; use the standard international labor organization operational definition to count an injury. Because an injury definition can significantly affect the prevalence estimate a reportable injury definition is important. Additionally, the previous studies did not use the revised micro and small-scale definition and the extent of the problem are yet not studied in the study area. Furthermore, in this research additional variables that may have a great effect on occupational-injury like the number of workers per industry, occupational safety-signs, and safety practice were assessed. The main aim of this study is, therefore, to assess the prevalence of occupational-injury and associated factors among micro and small-scale wood and metalworking industry workers in Debre Berhan town, north east, Ethiopia.

1.3. Significance of the study

Evidence-based occupational health and safety services are essential in Ethiopia. From an occupational health point of view, work-related injury data can provide useful information for the development of injury prevention strategies. Prevalence of occupational-injury data has a critical part to play with identifying hazards and this in turn helps in distinguishing the most appropriate targets for prevention. So, this study will play its part in, determining the existing prevalence of occupational-injuries and identifying associated factors, developing effective strategies to prevent and control occupational-injury among micro and small-scale wood and metalworking industry workers.

The findings of the study will give more insight to Debre Berhan town labor and social affairs office, micro and small-scale enterprise office, North Showa Health Administration; and owners of industries on the extents of the problem and the associated factors of occupational-injury. The piece of work will also provide the opportunity of creating awareness on the risk factors of occupational injury for employers and workers. This study also provides baseline information about work-related injury for local decision-makers to design appropriate intervention strategies and more successful prevention programs to improve occupational health and safety of micro and small-scale industry workers. It will also provide baseline information for researchers for further investigation.

2. Literature Review

2.1. Overview of occupational safety and health

Occupational safety and health (OSH) is the science of the anticipation, recognition, evaluation, and control of hazards arising in or from the workplace that would impair the health and well-being of workers taking into consideration the possible impact on the encompassing communities and therefore the general environment(42).

2.2. Prevalence of occupational injury

With expansion of Micro and Small-scale industries, employment in unsafe and insecure work is becoming a significant phenomenon that leads to a high prevalence of occupational-injury(29). The best evidence for this is the fact that-a cross-sectional study which was conducted among Micro and Small-scale industry workers in Iran, Bangladesh, India and another study conducted in 2015 and 2017 in Nigeria, revealed that the prevalence of occupational injury was 60.37%, 28.3%, 44% 48.5% 85.7% respectively(2,20–22).

In Ethiopia, few attempts have been made to identify occupational-injuries and their contributing factor among micro and small-scale industry workers which had a higher prevalence of occupational injury. A review article done in 2016 in Ethiopia among manufacturing industry workers, small-scale welders in Lideta sub-city, Addis Ababa, micro and small-scale industry workers in Mekelle city, Mizan Aman town, Arbaminch town and Bahirdar town, Bale zone, Micro and Small scale woodworkers in Addis Ababa showed that prevalence of occupational was 33.3%,94.2%,58.2%,45.2%, 80.8% 34.2% ,30% and 14.7% per year respectively(10,13,14,23–25,29,41).

2.3. Common occupational-injuries, causes, parts of the body affected and time of injury

Most of the research findings showed that the common types of injury experienced by workers in the manufacturing sector were cut, puncture, abrasion and laceration, the most common cause of injury was machineries, hand tools and splintering objects and the most affected body parts were hands, eye, fingers and legs. And similar finding was observed with studies conducted in India, in Ethiopia in Arba Minch town, Mizan Aman town, Bahirdar town, Mekelle city, Bale zone, and Addis Ababa(23–25,30,41,43). Regarding the distribution of occupational-injuries by the time of injury, most studies revealed that the highest injury rates occurred in the morning(14,25,41). In contrary to this finding in the study conducted

among small-scale industry workers in Arba Minch town showed the most time of injury was occurred in the afternoon(24)

2.4 Factors associated with occupational-injuries

2.4.1 Socio-demographic factors

Findings from most researches revealed that work-related injuries result from a complex interplay of multiple risk factors. Socio-demographic characteristics of workers, Behavioral factors, and environmental factors are the potential risk factors of occupational-injury. Association between socio-demographic variables and occupational injury in different investigators results show that sex and age had a significant association with occupational-injury (44). Research conducted in India and in Ethiopia in Bahirdar town and Mekelle city among Micro and small-scale industry workers revealed that age were the significant predictors of occupational injury(29,30,43). Even if occupational injuries affect all categories of workers under the age of 30 had a greater risk of occupational-injury than those 30 years and above in these studies. Additionally, sex of the worker was a significant predictor of occupational injury in studies, conducted in India and in Ethiopia in Bahirdar town. In these studies men had a higher risk of occupational injury than women (29,43).

A cross-sectional study conducted among small- scale industry workers in Bahirdar and Mekelle city shows there was a significant association between work experience and occupational-injury. In these studies workers which have low work experience (5 years or less) experience more occupational-injuries than their counterparts. Studies suggest that this might be due to lack of experience influences the interaction between the person and other workers, knowledge of machines and tools in use and their defects, and awareness of surrounding hazards(29,30). In another study conducted in Bahirdar town Workers, salary per month was found to be significantly related to injury occurrence. Workers with low income had more occupational-injuries than workers with good salaries. The study suggests that Workers with good salaries are usually highly educated have supervisory jobs and have less exposure to job hazards(29).

A cross-sectional study conducted in Mekelle city showed job category was the predictor of occupational injury in which Metalworkers were 3.17 times and woodworkers were 2.34 times more likely to experience an occupational injury than block manufacturing workers(30). While in contrary to this finding in the studies conducted India, in Ethiopia in Mekelle and Bahirdar city socio-demographic variables like marital status, employment pattern and level of education have no significance association with occupational

injury(29,30,43). However in studies conducted in the Mizan Aman town, Bale zone, Arba Minch town ,Addis Ababa showed no significant association between socio-demographic factors with occupational-injury(23–25,41).

2.4.2 Working environment factors

Studies from the different countries showed that worked hours per week, workplace supervision, health, and safety training were predictors of occupational-injury(24,29,30,43). Literature indicated that there was a strong relationship between training on health and safety and reduced work accident rates among industrial workers. A study conducted among small-scale industry workers in India and in Ethiopia in Arbaminch, Mizan Aman, and Bale zone strengthens these ideas. Workers who had no training for their work are at high risk of injury than those who were trained for their work while information access to health and safety, regular workplace supervision, service duration in the same job, and working departments were not significant predictors of occupational-injury (23,30,43). A cross-sectional study conducted in 2016 among small-scale industry workers in Arba Minch town shows that the odds of having occupational injury among workers who did not get health and safety training was 6.3 times higher than those who trained (24).

Another study conducted in 2016 among small-scale industry workers in Mizan Aman and Mekelle city shows that the number of worked hours/week, working in the night shift was significantly associated with occupational injury. Working for more than 8 hours per day and working in the night shift were more likely to develop occupational-injuries than their counterparts(25,30). Additionally in study conducted in Addis Ababa among micro and small scale wood processing industries revealed that unguarded machines were a significant predictor of occupational-injury(41)

2.4.3 Behavioral factors

In both developed and developing countries the major behavioral risk factors of occupational-injury in the workplace were sleeping problem, cigarette smoking, alcohol consumption, Khat chewing, job dissatisfaction, and non-use of personal protective equipment. A study conducted in India among small-scale industry workers revealed that from behavioral determinants sleeping problems were the main predictor of occupational injury. Workers who complained problems of sleeping disturbance were more likely to report about two times the excess occupational-injury compared with workers who did not report the problem of sleeping disturbance. The study suggested that sleeping disturbance problems affected the ability to maintain wakefulness and concentration as well as the ability to assess or watch the

work environment and working conditions and perform duties safely. But non-use of personal protective equipment, alcohol consumption, Khat chewing, and cigarette smoking did not show a significant association with occupational injury in this study(43).

In the counterpart studies conducted in Ethiopia in Mekelle city, Arbaminch and Mizan Aman towns among small-scale industry workers shows sleeping disturbance has no significant association with occupational-injury, but in studies conducted in Arba Minch, Bahirdar town, Mizan Aman towns, and Mekelle city non- use of PPE was a significant predictor of occupational injury(24,25,30). Workers who use PPE had a lower probability of injury than those who do not use (13).

Additionally in the studies conducted in Mizan Aman town alcohol consumption and cigarette smoking showed association with occupational-injury significantly. The odds of having occupational injuries in workers who drunken alcohols were 2.3 times higher when compared with non-drinkers (25). Studies revealed that the risk of work-related injury decreased with job satisfaction. A study conducted in Addis Ababa among Micro and Small-scale wood processing industry workers showed that job satisfaction is a significant predictor of occupational injury(41).

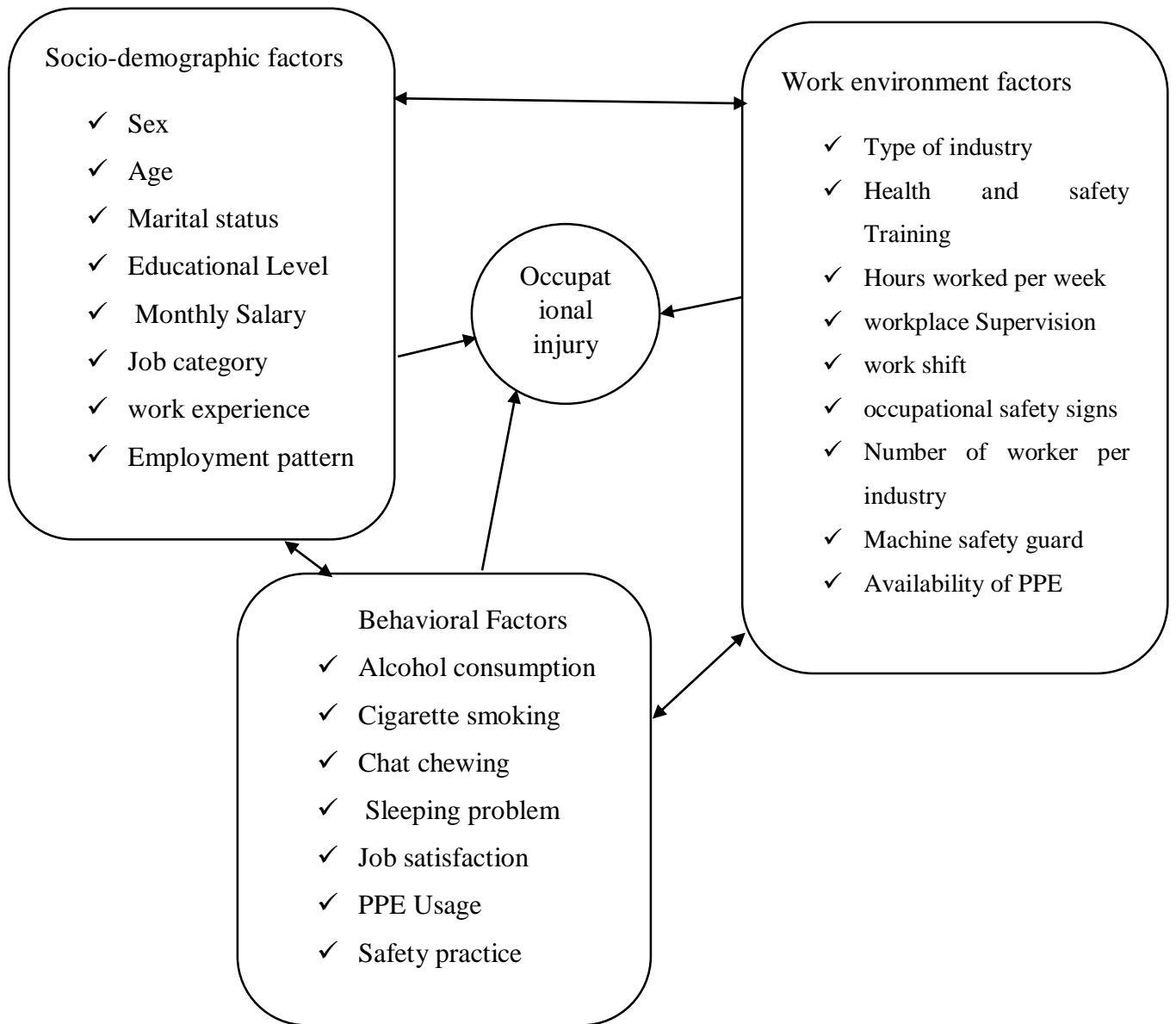


Figure 1. Conceptual Framework for study Occupational injury adapted from (24,25,29,30) 2020.

3. Objectives

3.1 General objective

To assess the prevalence of occupational-injury and associated factors among micro and small-scale wood and metalworking industry workers in Debre Berhan town, North-east, Ethiopia, 2020.

3.2. Specific objectives

To determine the prevalence of occupational-injury among micro and small-scale wood and metalworking industry workers in Debre Berhan town, North-east Ethiopia, 2020.

To identify factors associated with occupational-injury among micro and small-scale wood and metalworking industry workers in Debre Berhan town North-east Ethiopia, 2020.

4. Methods and Materials

4.1. Study area and period

This study was conducted in Debre Berhan town. It is found in the North Showa zone, Amhara national regional state, North-East Ethiopia. It is 130 kilometers far from Addis Ababa. Debre Berhan town lies at 2800m above sea level which has a typical subtropical highland climate with an average temperature of 14.4 °C and the average rainfall is 964 mm. It has a total population of 114,652 among them 62,809 are Females and 51,843 are Males. The town has nine Kebeles that include 208 micro and small-scale wood and metalworking enterprise (MSE). Among these, 152 are micro-scale industries and 56 are small-scale industries. The study was undertaken from February 20- March, 10, 2020.

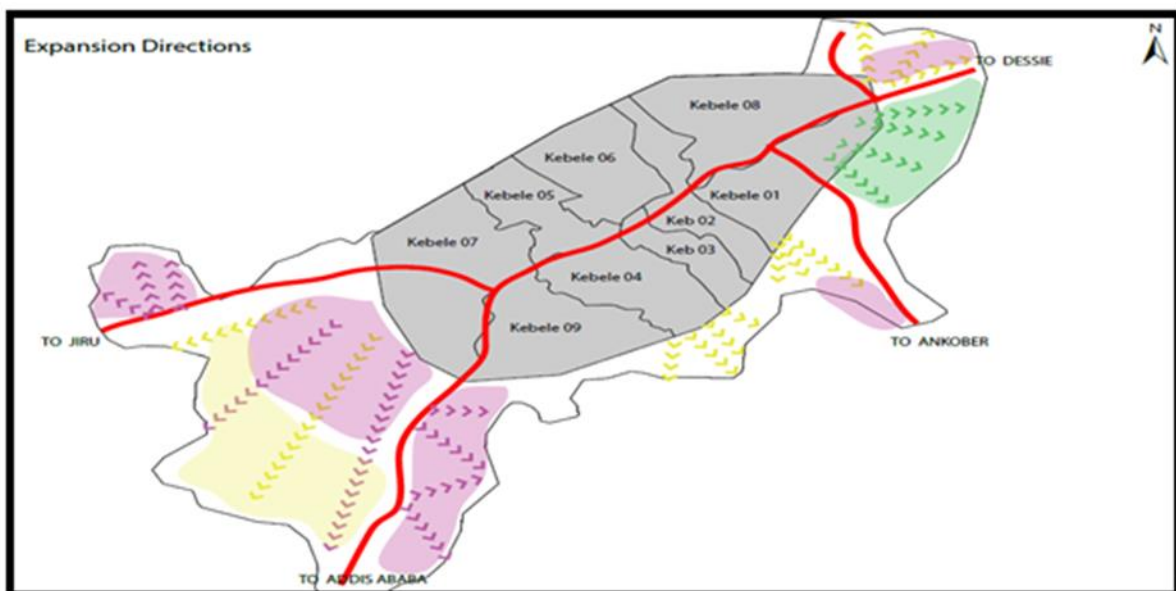


Figure 2. Map of study area adapted from Debre Berhan town Municipality, Debre Berhan, Ethiopia, 2020.

4.2. Study design

An institutional-based cross-sectional study design was conducted

4.3. Source population

All employees working in micro and small-scale wood and metalworking industries in Debre Berhan town.

4.4. Study population

All employees working in the selected micro and small-scale wood and metalworking industries engaged in production process in Debre Berhan town.

4.5. Sampling unit

Micro and Small-scale wood and metal working industries.

4.6. Study unit

Individuals who fulfill inclusion criteria from selected micro and Small-scale wood and metal working industries

4.7. Inclusion and Exclusion criteria

4.7. 1.Inclusion criteria

All employees who were directly engaged in the production process within the past one year were included.

4.7.2. Exclusion criteria

Workers who were critically ill and temporary on leave during the time of data collection were excluded from the study.

4.8. Sample size determination

The sample size required for the study was calculated using a single population proportion formula by considering the following assumptions:

$$n = \frac{(Z\alpha/2)^2 P(1-P)}{d^2} \text{ Where}$$

Assumptions: With the assumptions of 95% Confidence level,

n= required sample size,

$Z\alpha/2$ = critical value for normal distribution at 95% confidence level which equals to 1.96 (Z value at $\alpha=0.05$),

P= prevalence of occupational-injury among micro and small-scale industry workers and

d= desired precision (5% margin of error).

Based on the previous study prevalence estimates of 30 %(23)

$$n = \frac{(1.96)^2 * 0.3(1-0.3)}{0.05^2} = 323$$

n = 323. Because, the sampling method used to select the study participant was cluster sampling design effect of 2 was used in this study. Adding a design effect of two, the sample size becomes 646

And adding 10% contingency for the non-response rate the final sample size becomes **711**

For the second objective (associated factors), by taking significantly associated variables, the sample size is calculated by using Epi Info 7 STATCAL software, cross-sectional and unmatched cohort study calculation option as follow.

Table 1. Sample size determination for the second objectives (Associated factors)

variables	CI	power	Ratio(Une xposed: Exposed)	Prevalence of occupational injury on exposed	Prevalence of occupational injury on un exposed	AOR	Sampl e size	Refer ence
Cigarette smoking	95	80	0.36	26.5 %	73.5%	4.65	263	26
PPE use	95	80	0.59	37.4%	62.6%	0.32	261	26
health and safety training	95	80	5.99	85.7 %	14.3%	6.3	173	25
work for more than 48 hours per week	95	80	0.75	42.9%	57.1	2.73	363	14

From the prevalence and associated factors the larger sample size is **711**.Therefore, the sample size required for this study was 711

4.9. Sampling techniques

A cluster sampling technique was used to select the sample among micro and small-scale wood and metalworking industry workers. Debre Berhan town has six organized micro and small-scale industry clusters that includes a total of 208 wood and metalworking industries. Five clusters were selected by simple random sampling. Then all employees who were directly engaged in the production process in the selected clusters were selected to participate in the study, and that was 727.

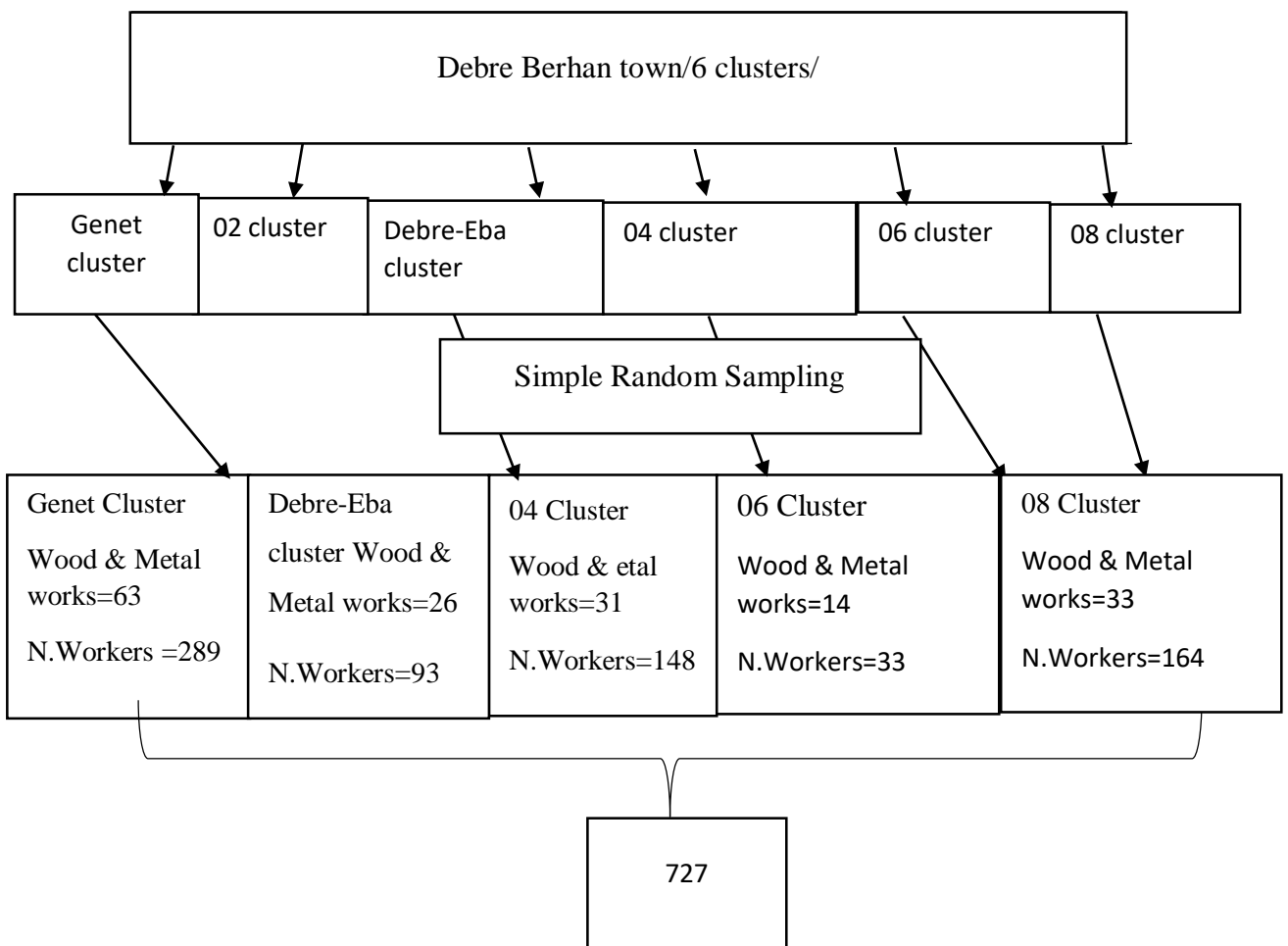


Figure 3. Graphical presentation of the sampling procedure for prevalence of occupational injury and associated factors among micro and small-scale wood and metalworking industry workers in Debre Berhan town, 2020.

4.10. Study variables

4.10.1. Dependent variable

Occupational-injury

4.10.2. Independent variable

Socio-demographic variables:-Sex, Age, Marital status, religion, educational level, Monthly Salary, work experience, employment pattern and Job category

Work environment variables:-Type of industry, health and safety training, hours worked per week, number of workers per industry, workplace supervision, work shift, occupational safety signs, machine safety guard, and availability of PPE

Behavioral variables:-Alcohol consumption, Cigarette smoking, Khat chewing, Sleeping problem, Job satisfaction, Safety Practice and use of PPE.

4.11. Data collection tools and procedures

Data were collected using a pre-tested structured questionnaire and observational checklist through face to face interviews and observation. The questionnaires and checklist were adopted from occupational health and safety guidelines, standards, and other relevant studies with required modification based on research objectives(24,25,29,30).occupational-injury was measured using the International Labor Organization definition. The injury types were classified based on the International Statistical Classification of Diseases and Related Health Problems. The Generic Job Satisfaction Scale was used to measure overall job satisfaction levels of participants(45). A 10 item question having a response of (yes/no) was used to measure safety practice.

An observational checklist was used to assess Environmental variables and Personal Protective equipment utilization observed for each worker on duty. First, the questionnaires were prepared in English and then translated to local language (Amharic) by experts in both languages and then retranslated to English to check for consistency. Four Environmental health officers who were familiar with the study area and experienced in data collection collected the data. One Environmental health professional supervised the data collection. Before the actual data collection pre-test was done among 5% of the sample size on micro and small-scale wood and metalworking industry workers in Chacha town. Finally, the data collection tool was refined based on the findings from the pre-test. Every day, all collected data were reviewed and checked for completeness and consistency by the supervisor and principal investigator.

4.12. Data quality assurance

The questionnaire was pre-tested on 36(5%) of the study participants among micro and small-scale wood and metalworking industry workers in Chacha town. Based on the pre-test; questions were revised, edited and those found to be unclear or confusing were modified. The reliability of the tools was checked by using Cronbach alpha (0.785). Training was given for data collectors and supervisor for one day on all important components of the questionnaire such as operational definitions, ethical issues, and time of questioning of workers. Supervision during data collection was done to see how data collectors handled the data collection. Filled questionnaires were checked daily for completeness, legibility, and consistency. The time of data collection through interviews was done in the morning before the beginning of the work, afternoon immediately after lunch before the beginning of the work, and observation was conducted at the time of performing their work.

4.13. Data processing and analysis

The collected data were checked for completeness and consistency by the investigator ahead of data entry for analysis. Completed questionnaires were coded and entered into Epi- Data version 3.1. Cleaning was made to avoid missing values, outliers, and other inconsistencies. The Cleaned data that was entered into Epi- Data version 3.1 statistical packages was exported to SPSS version 21.0 for analysis. The data from the interview and observation were analyzed simultaneously. Descriptive statistics was computed to explore frequency distribution, central tendency, and distribution of the outcome and explanatory variables.

Logistic regression assumption tests were tested that includes no multicollinearity among the independent variables. Multicollinearity was checked by using variance inflation factor (VIF=1.042). The model goodness of fit was checked by using Hosmer Lemeshow goodness of fit ($P > 0.05$). Binary logistic regression analysis was carried out to identify candidate variables for multivariable logistic regression. Independent variables that had a p-value less than 0.25 were entered into multivariable logistic regression analysis (backward stepwise procedure) to control confounders. The strength of association of predictor variables were assessed using adjusted odds ratio and P-value < 0.05 at 95% CI was considered statistically significant. The findings of the study were presented in text and tables.

4.13. Operational Definitions

Self-reported Occupational-injury: any personal injury resulting from an occupational accident sustained on the worker in connection with the performance of his or her work within the past 1 year and those injured workers should have been away from work at least one day because of the injury, in addition to the day of the incident (1).

Micro-scale industry: an industry that uses a power-driven machines and employees less than six workers (11)

Small-scale industry: an industry that uses a power-driven machine and employs between 6 and 30 workers(11)

Personal Protective Equipment: - Specialized clothing or equipment worn by employees for protection against health and safety hazards at the time of work includes goggles, helmet, face shield, gloves, boots, and specialized clothing (46).

Personal Protective Equipment Utilization:-Utilization of specialized clothing or equipment worn by employees for protection against health and safety hazards. Workers were classified as those who used PPE when they were observed wearing the PPE that were necessary to be worn during a particular activity(46).

Cigarette smoker:-An employee who was smoking one cigarette a day for at least 1 year(24).

Alcohol drinker:- An employee who drinks any alcohol at least five drinks per week for men and two drinks per week for women for at least 1 year(30).

Job satisfaction: A worker who has scored $\geq 90\%$ was considered as had job satisfaction and $< 90\%$ were considered as dissatisfied by his/her job(43)

Khat chewer: An employee chewing Khat (a mild psychoactive substance) three times a week for at least 1 year(25).

Sleeping problem: The presence of sleepiness problem when the worker is at work in the industry(47)

Occupational safety signs - Are safety signs for warning when a hazard or a hazardous condition is likely to be life-threatening(48).

Safety Practice: A worker who has scored $\geq 60\%$; was graded as Good and $< 60\%$ poor(47)

Excessive noise: Noise that makes it difficult to communicate with your neighbor in 1-meter distance without shouting(29).

Excessive dust: This is when the worker's eye brows, hair, nostrils ,and cloths are observed by assessor to be covered with dust particles(49).

Excessive heat: The heat is recorded as excessive if a worker is found sweating when naked or with light clothing(49).

Health and safety training: Trainings given to a worker on health and safety with in the past one year(49)

4.14. Ethical considerations

Ethical clearance was obtained from the Ethical Review Committee of College of Health Sciences, Debre Berhan University. Permission to conduct the study was obtained from Debre Berhan town micro and small-scale industry office. Prior to the interview owners were informed and communicated and data collection was then conducted after explaining the aim of the study and its possible benefits to the study participants. Verbal consents were obtained after explaining their full right to refuse, withdraw any time, without any explanation or giving reasons. The interviewers have discussed the issue of confidentiality. In addition, any identifying information including the name of the participants was not written in the questionnaire. If there was an incident that results in injury to the worker while interviewing, an immediate referral to their satellite health center was arranged prior to data collection. However, there was no incident that results in injury. Study participants were informed on common causes and methods of preventing occupational-injuries by the interviewer after completing the interview.

4.15. Dissemination of the result

The findings of the study will be submitted to the Department of Public Health College of Health sciences of Debre Berhan University. It will also be communicated to Debre Berhan town micro and small-scale industry coordination office, Debre Berhan town labor and social affairs office, to each studied industry and to those organizations concerned with the promotion of Occupational health and safety at workplaces. Peer-reviewed publications will be also considered.

5. Results

5.1. Socio-demographic Characteristics of Respondents

A total of 723 respondents were interviewed for this study with a response rate of 99.4%. Of the total participants, 593 (82%), were male workers, under the age of 25 years 397(54.9%) and their median age was 25 years with an interquartile range of four years. A significant number of 377(52.1%) workers had work experience of less than 5 years. Regarding the employment pattern, 427(59.1%) was temporarily employed. The majority of the participants, 698(96.5%) were orthodox religious followers and 448(62%) were single (table 1).

Table 1. Socio-demographic characteristics of respondents in micro and small-scale wood and metalworking industries, Debre Berhan town, North East Ethiopia, 2020(n=723)

Variables	Number (%)
Sex	
Male	593(82%)
Female	130(18%)
Age group	
Under 25	397(54.9%)
25-30	259(35.8%)
>30	67(9.3%)
Religion	
Orthodox	698(96.5%)
Others	25(3.5%)
Educational level	
Can't read and write	33(4.6%)
Can read and write	80(11%)
Primary school(1-8)	197(27.2%)
Secondary school (9-12)	182(25.2%)
Graduated from technical and vocational	231(32%)
Marital status	
Married	252(34.9%)
Single	448(62%)
Others	23(3.1%)

Employment Pattern

Permanent	296(40.9%)
Temporal	427(59.1%)

Job category

Wood worker	377(52.1%)
Metal worker	346(47.9%)

Work experience

<5	377(52.1%)
≥5	346(47.9%)

Monthly salary

<2000	244(33.7%)
2001-3500	282(39.1%)
>3500	197(27.2%)

Note- Religion (Others:-Muslim and protestant

Marital status (others: - divorced, widowed and separated)

5.2. Prevalence and characteristics of occupational-injury

A total of 284(39.3 %) (95% CI: 35.7, 42.7) respondents were reported occupational-injury during the last 12 months. Out of the injured respondents, 176(62%) sustained occupational-injury once. Moreover, 33(4.6%) respondents had experienced occupational-injuries in two weeks periods prior to the data collection. Of these cases 25(75.7%) reported that they had sustained occupational-injury once (Table 2).

Table 2. Prevalence of occupational-injuries among respondents in micro and small-scale wood and metalworking industries, Debre Berhan town, North East Ethiopia, 2020.

Variables	Number (%)
Occupational injury in the last 12 months(n=723)	
Yes	284(39.3%)
No	439(60.7%)
Injury frequency in the last 12 months(n=284)	
Once	176(62%)
Two and more	108(38%)
Occupational injury in the last two weeks(n=723)	
Yes	33(4.6%)
No	690(95.4%)
Injury frequency in the last two weeks(n=33)	
Once	25(75.7%)
Two and more	8(24.3%)

Regarding types of injury, cut 206(72.5%)was predominantly occurred injury type and hands were the body parts mostly affected by occupational-injury 216(76.1%).The main sources for occupational-injury was Machinery 202(71.1%) (Table.3).

Table 3.Distribution of occupational-injury by part of the body affected, type and causes of injuries among respondents in micro and small-scale wood and metalworking industries, Debre Berhan town, North East, Ethiopia, 2020(n=284).

Variables	Number (%)
Parts of the body affected(n=284)	
Hand	216(76.1%)
Upper Arm	41(14.4%)
Lower Arm	35(12.3%)
Upper Leg	18(6.3%)
Lower Leg	23(8.1%)
Finger	41(14.4%)
Toe	36(12.7%)
Knee	20(7%)
Eye	74(26.1%)
Others	12(4.2%)
Types of injury(n=284)	
Abrasion	85(29.9%)
Cut	206(72.5%)
Puncture	88(31%)
Fracture	62(21.8%)
Dislocation	45(15.8%)
Others	23(8.1%)
Cause of injury(n=284)	
Machinery	202(71.1%)
Hit by Falling objects	22(7.7%)
Electricity	9(3.2%)
Splintering objects	77(27.1%)
Hand tools	125(44%)
Fall	18(6.3%)
Lifting heavy objects	38(13.4%)

#Note: parts of the body affected (Others: - Lower Leg, Knee, Ear, Tooth, back and multi-location)

Types of injury (others:-Burn, Eye and Ear injury)

* Percentage exceeds 100 because of multiple responses

In this study the highest number of injuries was occurred in the afternoon 147(51.8%). About 127(44.7%) of the injuries resulted in the workers being absent from work for more than 3 days. From the total respondents who reported occupational-injury, 56(19.7%) were hospitalized, accounting for 54(96.4%) hospitalizations less than 24 hours. Moreover, a total of 1735 working days were lost due to injury (Table 4).

Table 4. Distribution of occupational-injury by time of injuries and days lost due to injury among respondents in micro and small-scale wood and metalworking industries, Debre Berhan town, North East Ethiopia, 2020.

Variables	Number (%)
Time of injury	
Morning	33(11.6%)
Afternoon	147(51.8%)
Evening	44(15.5%)
Mid night	60(21.1%)
Activity while injured	
Welding	127(44.7%)
Cutting	105((37%)
Smoothing, shaping and finishing	45(15.8%)
Other works in production process	7(2.5%)
Days lost due to injury	
≤3 days	157(55.3%)
>3 days	127((44.7%)
History of hospitalization	
Yes	56(19.7%)
No	228(80.3%)
Length of hospitalization	
≤24 hours	54(96.4%)
>24 hours	2(3.6%)

5.3 Environmental characteristics

Of the total respondents, 602(83.3%) of the employees had worked for more than 48 hours per week, 661(91.4%) did not take any health and safety training and 651(90%) reported that their workplaces were not supervised regularly. About 405(56 %) workers were worked in industries that had no safety guarding of machines (Table 5).

Table 5. Environmental characteristics of the respondents in micro and small-scale wood and metalworking industries, Debre Berhan town, North East Ethiopia, 2020(n=723).

Variables	Number (%)
Hours worked per week	
≤ 48	121(16.7%)
>48	602(83.3%)
Workplace supervision	
Yes	72(10%)
No	651(90%)
Safety training	
Yes	62(8.6%)
No	661(91.4%)
Occupational Safety signs	
Yes	96(13.3%)
No	627(86.7%)
Number of worker/industry	
1-5	367(50.8%)
6-10	200(27.6%)
>10	156(21.6%)
Types of industry	
Micro scale	363(50.2%)
Small scale	360(49.8%)
Work shift	
Yes	182(25.2%)
No	541(74.8%)
Machine Safety guard	
Yes	318(44%)
No	405(56%)
Availability of PPE	
Yes	222(30.7%)
No	501(69.3%)

5.4. Behavioral Characteristics of Respondents

Regarding behavioral characteristics of respondents, 509(70.4%) consume alcohol, 296(40.9%) smoke cigarette, 553(76.5%) did not use personal protective equipment and 597(82.6 %) of the workers had poor safety practice (Table 6).

Table 6. Behavioral characteristics of the respondents in micro and small-scale wood and metalworking industries, Debre Berhan town, North East Ethiopia, 2020(n=723).

Variables	Number (%)
Alcohol drink consumption	
Yes	509(70.4%)
No	214(29.6%)
Number of drinks per week	
2-5 drinks	78(15.3%)
>5 drinks	431(84.7%)
Khat chewing	
Yes	406(56.2%)
No	317(43.8%)
Frequency of Khat chewing	
≤3 times/week	42(10.3%)
>3times/week	364(89.7%)
Cigarette smoking	
Yes	296(40.9%)
No	427(59.1%)
Number of cigarrete smoked/day	
1 cigarrete/day	17(5.7%)
>1cigarette/day	279(94.3%)
Sleeping problem during your work	
Yes	251(34.7%)
No	472(65.3%)
PPE Usage	
Yes	170(23.5%)
No	553(76.5%)
Job satisfaction	
Yes	81(11.2%)
No	642(88.8%)
Safety practice	
Poor	597(82.6%)
Good	126(17.4%)

5.5. Types of personal protective equipment (PPE) used

Of the respondents, 170(23.5%) utilized the necessary PPE on duty. From this 157(92.4%) had used overalls, 118(69.4%) used gloves, 101 (64.7%) used goggle. The major reason behind non-use of PPE was lack of PPE which accounts for 296(53.5%).Among PPE users 82(48.2%) of PPE was supplied by institutions and the rest brought by workers by themselves (Table 7).

Table 7.Types of PPE utilized by workers and reasons for not using PPE among respondents in micro and small-scale wood and metalworking industries, Debre Berhan town, North East Ethiopia, 2020.

Variables	Number (%)
PPE utilized(n=170)	
Gloves	118(69.4%)
Ear Plug	11((6.5%)
Respirator	11(6.5%)
Helmet	15(8.8%)
Overalls	157(92.4%)
Goggle	101(64.7%)
Face musk	15(8.8%)
Boot	72(42.4%)
Reasons for not using PPE(n=553)	
Lack of PPE	296(53.5%)
Lack of safety training and health education	22(4%)
Not comfortable to use	134(24.2%)
Decrease work performance	101(18.3%)
From where did you get PPE(n=170)	
From the institution	82(48.2%)
Self	88(51.8%)

#Note: Percentage exceeds 100 because of one person uses more than one personal protective equipment.

5.6. Work environment observation

In this study, 167(122 micro scale and 45 small scale) sampled industries were inspected to identify potential occupational health and safety hazards based on the operational definition given on the observational checklist. The observation revealed that only 30(18%) of industries were found with excessive heat and 36(21.6%) with excessive noise. About 54(32.3 %) of the industries had first aid equipment that might serve if an injury occurs at work before reaching to the clinics (Table 8).

Table 8. Occupational health and safety hazards identified in selected micro scale and small-scale wood and metalworking industries, Debre Berhan town, North East Ethiopia, 2020.

Variables	Number (%)
Excessive heat(N=167)	
Yes	30(18%)
No	137(82%)
Excessive dust	
Yes	72(53%)
No	65(47%)
Excessive noise	
Yes	36(21.6%)
No	101(60.4%)
Poorly installed electric wire	
Yes	93(55.7%)
No	74(44.3%)
Presence of safety regulation	
Yes	0(0%)
No	167(100%)
First aid equipment	
Yes	54(32.3 %)
No	113(67.7%)
Written health and safety plan	
Yes	0(0%)
No	167(100%)

5.7. Analysis for associated factors of occupational-injury

5.7.1. Multivariable logistic regression analysis

Binary logistic regression analysis and variables with $P < 0.25$ were fitted in multivariable analysis

In the multivariable logistic regression analysis, after controlling the confounding variables, work environment variables including lack of workplace-supervision (AOR=1.696;95% CI:1.211,2.374),unguarded machine(AOR= 1.705;95% CI:1.196,2.430) and behavioral factors including, Cigarette smoking (AOR=2.565; 95%CI: 1.787, 3.683) not using PPE(AOR=1.667;95%CI: 1.078,2.577),Alcohol consumption(AOR = 2.473; 95% CI: 1.584,3.860), and poor safety practice (AOR=2.201; 95% CI:1.316-3.680) were significantly associated with occupational-injuries ($p < 0.05$) (table 9).

Table 9. Multivariable logistic regression analysis of individual factors associated with occupational-injury among respondents in micro and small-scale wood and metalworking industries, Debre Berhan town, North East, Ethiopia, 2020

Variable Name	Injury Status		Crude Odds Ratio	Adjusted Odds ratio
	Yes	NO		
Marital status				
Married	89(35.3%)	163(64.7%)	1	1
Single	180(40.2%)	268(59.8%)	1.230(0.893-1.694)	0.254(0.053-1.222)
Others	15(65.2%)	8(34.8%)	3.434(1.402-8.413)	0.335(0.071-1.579)
Employment pattern				
Permanent	132(44.6%)	164(55.4%)	1	1
Temporal	152((35.6%)	275(64.4%)	0.687(0.507-0.930)	1.253(0.880-1.785)
Hours worked / week				
≤48	31(25.6%)	90(74.4%)	1	1
>48	253(42%)	349(58%)	2.105(1.357-3.265)	0.962(0.556-1.665)
Workplace supervision				
Yes	22(30.6%)	50(69.4%)	1	1
No	262(40.2%)	389(59.8%)	1.531(0.905-2.589)	1.696(1.211-2.374)*
Safety training				
Yes	16(25.8%)	46(74.2%)	1	1
No	268((40.5%)	393(59.5%)	1.961(1.087-3.536)	1.330(0.436-4.055)
No-worker/industry				

1-5	162(44.1%)	205(55.9%)	1.580(1.068-2.338)	1.180(0.578-2.407)
6-10	70(35%)	130(65%)	1.077(0.692-1.675)	0.884(0.532-1.469)
>10	52(33.3%)	104(66.7%)	1	1
Types of Industry				
Micro scale	166(45.7%)	197(54.3%)	1.728(1.278-2.337)	1.316(0.554-3.129)
Small scale	118(32.7%)	242(67.3%)	1	1
Work shift				
Yes	53(29.1%)	129(70.9%)	1	1
No	231(42.7%)	310(57.3%)	1.814(1.262-2.606)	1.168(0.745-1.831)
Machine Safety guard				
Yes	91(28.6%)	227(71.4%)	1	1
No	193(47.7%)	212(52.3%)	2.271(1.663-3.102)	1.705(1.196-2.430)**
Alcohol drinking				
Yes	245(48.1%)	264(51.9%)	4.164(2.825-6.139)	2.473(1.584-3.860)**
No	39(18.1%)	175(81.8%)	1	1
Cigarette smoking				
Yes	175(59.1%)	121(40.9%)	4.219(3.071-5.798)	2.565(1.787-3.683)*
No	109(25.5%)	318(74.5%)	1	1
Sleeping problem				
Yes	109(43.4%)	142(56.6%)	1.303(0.954-1.779)	1.126(0.764-1.660)
No	175(30.1%)	297(69.9%)	1	1
PPE Usage				
Yes	45(26.5%)	125(73.5%)	1	1
No	239(43.2%)	314(56.8%)	2.114(1.446-3.092)	1.667(1.078-2.577)**
Job satisfaction				
Yes	22(27.2%)	59(72.8%)	1	1
No	262(40.8%)	380(59.2%)	1.849(1.106-3.096)	0.983(0.485-1.992)
Safety practice				
Poor	255(42.7%)	342(57.3%)	2.494(1.598-3.893)	2.201(1.316-3.680)**
Good	29(23%)	97(77%)	1	1

Note: #: Only variables reached p-value less than 0.25 were kept in the subsequent analysis, and displayed in the table.

1, Reference group

* significant @ $p < 0.05$ ** Significant @ $p < 0.001$

6. Discussion

This institutional-based cross-sectional study attempted to assess the prevalence and associated factors of occupational- injuries within the last 12 months among micro and small scale wood and metalworking industry workers in Debre Berhan town,2020.The prevalence of occupational-injuries during this study was 39.3 % (95% CI: 35.7, 42.7). This finding was relatively lower than the studies conducted in Bangladesh (44%),India (48.5%), Nigeria 85.7%(20–22) Mizan Aman town, Mekelle city and Arba Minch town reported a prevalence of 45.2%,58.2% and 80.8% respectively(14,24,25).It might be due to the use of different case definitions to enumerate an injury. In this study the standard International Labor Organization (ILO) definition of occupational-injury was used (i.e. “an injury which causes absence of a worker from work at least one day after the day of an injury”) (50).

In contrary it was above the studies conducted in Bale zone and Addis Ababa (23,41). The possible reason behind this difference might be due to the difference in study population. Additionally this could be due to poor safety practice of workers, non-use of the necessary personal protective equipment and working with unguarded machine.

The result of this study revealed that hands were the body parts predominantly affected by occupational-injuries. This was consistent with study findings conducted in India, Nigeria, Mizan Aman town, Arba Minch town, Mekelle city, Bale zone and Addis Ababa (14,21–23,25,41). This might be due to, most of the time wood and metalworking activities were accomplished by the utilization of machinery and hand tools in which hands were repeatedly came in contact with. More over this could be due to exposure to unguarded machines and non –use of the necessary PPE.

This study also indicated that, cut was the most commonly reported injury type and contact with machinery and hand tools was found to be the main cause of occupational- injury. It was in line with studies conducted in India, Arbaminch town, Mekelle city, Mizan Aman town, Bale zone and Addis Ababa(21,23–25,30,41).This could be because of working with unguarded machines and malfunctioning hand tools and workers’ behavior such as alcohol drinking, cigarette smoking and non-use of PPE which could expose these workers to such injuries.

According to the current study, the most common time of occupational-injury was in the afternoon. This finding is in agreement with studies done in Arbaminch town(24) but contradicted with study conducted in Mekelle city, Mizan Aman town, Bale zone and Addis

Ababa(23,25,30,41). It would probably be due to workers who use substance like cigarette and alcohol mainly took those substances in the afternoon. Moreover this might be due to absence of work shift that result fatigue which may be associated with increase the likelihood of occupational-injuries in the afternoon.

The multivariable logistic regression analysis showed that lack of workplace supervision, working with unguarded machines, alcohol consumption; cigarette smoking, not using personal protective equipment and poor safety practices were significantly associated factors of occupational-injury among micro and small-scale wood and metalworking industry workers. The odds of having occupational injury among workers who work in industries which had no workplace supervision were 1.696 times more likely to develop occupational-injury than their counterparts (AOR=1.696;95%CI: 1.211,2.374).This was consistent with study conducted in bale zone(23). This could be explained by workplace supervision used for identification of the possible cause of injury such as unguarded machines, malfunctioning tools, non-use of personal protective equipment for making appropriate interventions to prevent the workers from occupational-injury.

Another environmental factor which was a predictor of occupational-injury in this study was working with unguarded machine. Respondents who works with unguarded machines were 1.705 times more likely to develop occupational injury than their counterparts (AOR= 1.705; 95%CI:1.196,2.430).This result was in line with studies conducted in Malaysia and Addis Ababa(41,51). This could be due to the majority of the work in wood and metal works were done with machineries in which workers are frequently come in contact with unguarded machines. The observational result also shows majority of the industries had no guards on hazardous parts of machinery which causes injury on the workers while on duty.

In relation to behavioral factors, alcohol drinking was strongly associated with occupational injury. The odds of having occupational-injuries in workers who drunken alcohols were 2.473 times higher compared with non-drinkers(AOR= 2.473;95%CI:1.584,3.860).This is consistent with the study in India, Arbaminch town and Mizan Aman town(21,24,25). This could possibly be due to alcohol intake may increase the probability of getting injury through engaging in risk taking behavior or reducing the perception and impair workers concentration response to hazards.

The other behavioral variable in concern of this study was cigarette smoking. The odds of having occupational-injury in workers who smoke cigarette were 2.565 times more likely to

develop occupational injury than non-smokers(AOR=2.565; 95%CI:1.787,3.683).This was consistent with a study done in Mizan Aman town(25). This could be because of Smoking habits decrease alertness in response to hazard make the worker in risk taking actions that lead to accident at work.

Another behavioral characteristic which was a significant predictor of occupational-injury in this study was workers' safety practices. The result revealed that the odds of having occupational-injuries in workers who had poor safety practice were 2.201 times higher than workers who had good safety practice (AOR=2.201; 95%CI: 1.316, 3.680).This might be due to non-use of the necessary personal protective equipment's compounded by non-availability of the necessary personal protective equipment's which was the major reason for the non-use of personal protective equipment in this study. This might also induced by behavioral factors like alcohol drinking and cigarette smoking might leads to poor safety practice.

The multivariable logistic regression analyses result suggested that respondents who did not use Personal Protective Equipment were 1.667 times more likely to develop occupational-injury as compared to those who used Personal Protective Equipment (AOR=1.667; 95%CI: 1.078-2.557).This finding was in line with studies conducted in Arba Minch town, Mizan Aman town, and Mekelle city(24,25,30). This could be explained by the fact that proper utilization of PPE highly reduces the occurrence of unexpected injuries. Findings of observation also showed that majority of the workers did not use the necessary personal protective equipment.

Even though most quantitative environmental factors didn't show association to occupational injury, the observational checklist result showed work environment variables such as safety signs, safety training, and hours worked per week and availability of personal protective equipment were strong variables. Regarding weekly working hours this study revealed no association, while it was a significant predictor of occupational injury in the studies conducted in India and Mekelle city(21,30). This difference could be due to the difference in the work conditions of the sectors. Another environmental factor that did not showed significant association with occupational-injury in this study was health and safety training while it was a predictor in studies conducted in India, Mekelle city, Arba Minch town(24,30,34).This difference could be due to difference in work settings and population

Most researchers concluded that job satisfaction increased occupational injury risks, and dissatisfied individuals were more likely to have involved in occupational injuries

(21,30,41).But this study didn't show significant association between job satisfaction and occupational injury. This can be explained by most workers were temporary workers, and most work taken by contract therefore each worker feel freedom and they take each work by voluntarily and according to their performance. This might be also due to difference in variable selection in multi variable logistic regression. The use of backward stepwise procedure in this study gives only the best predictor variables.

7. Limitations of the study

The study was a one -year cross-sectional study.

- ✓ The possibility of recall biases resulting in under or over reporting and misreporting of events was likely.
- ✓ The findings were based up on self-reporting in which injuries were not clinically confirmed.
- ✓ Workers who were injured and on leave during the study time may underestimate any association

8. Conclusion

In conclusion the prevalence of occupational-injuries among micro and small-scale wood and metalworking industry workers was relatively high as compared to other studies. Contact with unguarded machineries, lack of work place supervision, non-use of personal protective equipment, alcohol consumption, cigarette smoking, and poor safety practice were significant predictors of occupational-injury

9. Recommendations

In view of the above findings and conclusions, the following issues are recommended.

Debre Berhan town labor and social affairs office and North showa health administration:- It is recommended that Debre Berhan town labor and social affairs office and North showa zone health administration should have an integrated emphasis to reduce occupational-injury by conducting regular workplace supervision with feedback mechanism program and Behavioral change communication of workers by considering workers behavior including alcohol drinking, cigarette smoking, not-using Personal protective equipment and poor safety practice.

Owners: The owners/unions of micro and small-scale industries need to focus on implementing preventive measures such as doing preventive maintenance of hand tools and safety guarding of the unguarded machines and guarantee availability and utilization of appropriate personal protective equipment with regular supervision.

Workers: unhealthy life style (e.g. alcohol drinking, cigarette smoking) should be modified & changed by Behavioral change communication. Use of the necessary personal protective equipment at work was highly advisable.

Researchers: Further research with mixed study design is recommended for exploring further reasons behind occupational-injury.

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Annexes

Annex 1: English version questionnaire

Debre Berhan University College of Health Sciences Department of public Health 2012 E.C

Questionnaire for assessment of prevalence of occupational injuries and associated factors among micro and small-scale wood and metal working industry workers in Debre Berhan town.

Questionnaire identification number _____

Name of industry _____ Type of industry-----

Final product _____

Address: Kebele _____

Verbal consent form before conducting interview

Greeting

Hello, I am _____. I am working in the research team Debre Berhan University College of Medicine and health sciences Department of public Health. I would like to ask you a few questions about an incident at job that resulted in injuries to you in the previous 12 months. This will help us to improve occupational safety, health and working environment services provided to you based on your answer to our questions. Your name will not be written in this form and will never be used in connection with any information you tell us. All information given by you will be kept strictly confidential. Your participation is voluntary and you are not obliged to answer any question you do not wish to answer. If you feel discomfort with the interview please feel free to drop it any time you want. This interview will take about 30 minutes. Do I have your permission to continue?

1. If yes, continue to the next page
2. If no, skip to the next participant by writing reasons for his/ her refusal

Informed consent Certified by

Interviewer: Code _____ Name _____ signature _____

Date of interview _____ Time started _____ Time completed _____

Result of interview: 1.Completed 2.Respondent not available 3.Refused 4. Partially completed

Checked by Supervisor: Name _____ signature _____ Date _____

Questionnaire identification number _____

Section one: Socio demographic information

No	Question	Possible Response	Skipping	Code
101	Sex	1.Female 2.Male		
102	Age (If he or she does not know ask before and after event significant)	_____ Years		
103	Religion	1.Orthodox 2. Muslim 3. Protestant 4. Catholic 5. Others specify.		
104	Educational level	1. Can't read and write 2.Can read and write 3.Primary school (1-8) 4. Secondary school (9-12) 5.Graduated from Technical and Vocational school		
105	Marital status	1.Married 2.Single 3.Divorced 4.Widowed 5.Separated		
106	Employment Pattern	1.Permanent 2.Temporary		
107	Job category	_____		
108	Work experience	_____		
109	Daily salary in birr	_____		
110	monthly salary in birr	_____		

Questionnaire identification number _____

Section Two: Occupational-injury characteristics

No	Question	Possible Response	Skipping	Code
201	Have you had an incident at a job that resulted in an injury to you within the last two weeks?	1. Yes 2. No	If no, Skip to question 203	
202	If yes to Q201 , how many Times?	_____		
203	Have you had an incident at a job that resulted in an injury to you within the last 12 Months?	1. Yes 2. No	If no, Skip to Q 301	
204	If yes to 203, how many Times?	-----		
205	Part of the body Affected	a. Eye 1.Yes 2.No b. Tooth 1.Yes 2.No c. Hand 1.Yes 2.No d. Ear 1.Yes 2.No e. Knee 1.Yes 2.No f. Toe 1.Yes 2.No g. Finger 1.Yes 2.No h. Head 1.Yes 2.No i. Upper Arm 1.Yes 2.No j. Lower Arm 1.Yes 2.No k. Upper Leg 1.Yes 2.No l. Lower Leg 1.Yes 2.No m. Back 1.Yes 2.No n. Chest 1.Yes 2.No o. Multi- location 1.Yes 2.No p. Other specify _____		
206	Type of injury	a. Abrasion 1. Yes 2. No b. Cut 1. Yes 2. No c. Burn 1. Yes 2. No d. Puncture 1. Yes 2. No e. Fracture 1. Yes 2. No f. Dislocation 1. Yes 2. No g. Eye injury 1. Yes 2. No h. Ear injury 1. Yes 2. No i. Suffocation 1. Yes 2. No j. Electrocutions 1. Yes 2. No k. Amputation 1. Yes 2. No l. Poisoning 1. Yes 2. No m. Other, specify _____		
207	What were you			

	doing at the time of injury	-----		
208	Causes of injury	a. Machinery 1.Yes 2.No b. Hit by Falling objects 1. Yes 2.No c. Electricity 1.Yes 2.No d. Splintering objects 1. Yes 2.No e. Hand tools 1. Yes 2.No f. Fire 1.Yes 2.No g. Acids, hot substances 1.Yes 2.No h. Falls 1.Yes 2.No i. Collision with objects 1.Yes 2.No j. Lifting heavy objects 1.Yes 2.No k. Other, specify _____		
209	Time of injury	a. In the morning 1.Yes2.No b. In the Afternoon 1.Yes2.No c. In the evening 1.Yes2.No d. In midnight 1.Yes 2.No		
210	Were you hospitalized as result of injury in the last 12 months	1. Yes 2. No		
211	If Yes Q. 210, for how long	_____		
212	Number of days lost due to injury at work last one year (in days)	_____		

Section three: Work environment information

No	Question	Possible Response	Skipping	Code
301	How much is your weekly working hour?	_____		
302	Is your workplace regularly supervised on safety and health?	1. Yes 2.No		
303	Have you had any safety training in connection with new employment, new equipment or other Changes in the last one year?	1. Yes 2.No		
304	Are there always functional dangers or warning signs during your activities	1. Yes 2.No		
305	Number of worker/industry	_____		
306	Types of industry	1.Micro scale 2.Small scale		
307	Is there work shift in the industry?	1. Yes 2.No		
308	Are machines you are working with always guarded or installed With safety devices?	1. Yes 2.No		
309	Is the necessary PPE available in the industry?	1. Yes 2.No		

Section four: Information on workers behavior

No	Question	Possible Response	Skipping	Code
401	Do you drink Alcohol?	1. Yes 2. No	If No, go to q 403	
402	If yes to 401, how Much drinks per week?	_____		
403	Do you chew Khat?	1. Yes 2. No	If No, go to q 405	
404	If yes to Q403, how Often?	_____		
405	Do you smoke cigarette?	1. Yes 2. No	If No, go to q 407	
406	If yes to Q405, how much cigarette per day?	_____		
407	Do you have any Sleeping problem during your work?	1. Yes 2. No		
408	Did the worker use personal protective Equipment?	1. Yes 2. No	If no skip to Q 410	
409	If yes to Q 408, what Type?	a. Gloves 1. Yes 2. No b. Ear plug 1. Yes 2. No c. Respirators 1. Yes 2. No d. Helmet 1. Yes 2. No e. Overalls 1. Yes 2. No f. Goggles 1. Yes 2. No g. Face shield 1. Yes 2. No h. Boots 1. Yes 2. No i. Others, specify__		
410	What are your reasons for not using personal Protective equipment?	a. Lack of protective equipment. b. Lack of safety and health Training. c. Not comfortable to use d. Decrease work performance e. Create safety and health hazards f. Other, specify_____		
411	From where do you get PPE? (more than one answer is possible)	a. It is supplied by institution b. You buy it for your self c. Others, specify		

Job satisfaction questionnaire

S.No	Items	1 (SD)	2 (D)	3 (N)	4 (Agree)	5 (SA)
409.1	I receive recognition for a job well done					
409.2	I feel close to the people at work					
409.3	I feel good about working at this industry					
409.4	I feel secure about my job					
409.5	I believe management is concerned about me					
409.6	On the whole, I believe work is good for my physical health					
409.7	My wages are good					
409.8	All my talents and skills are used at work					
409.9	I get along with my supervisor					
409.10	I feel good about my job					

Safety practice questionnaires

S.NO.	Items	Yes	No	NA
410.1	Did the worker use personal protective equipment all time?			
410.2	Do you properly set your PPE after you finish your work?			
410.3	Do you keep cleanness of your working station and tools?			
410.4	Do you follow stated work procedures when you doing work?			
410.5	Do you report dangerous situations when you see them in work place?			
410.6	Have you ever reported to your supervisor faults or conditions involving a risk for you or other workers?			
410.7	Do you report all work-related injuries and illnesses to your supervisor promptly, regardless of how minor they may seem			
410.8	Do you Report any equipment/machine malfunctions or defects to the supervisor?			
410.9	Have you ever asked for personal protection equipment?			
410.10	Obey appropriately for posted safety signage			

That is the end of our questionnaire. Thank you very much for taking the time to answer these Questions. We appreciate your help

Annex 2: Amharic version questionnaire

በደብረ ብርሃን ዩኒቨርሲቲ የህክምናና ጤና ሳይንስ ኮሌጅ የህብረተሰብ ጤና ትምህርት ክፍል

ይህ መጠይቅ በደብረ ብርሃን ከተማ በስራ ላይ ያሉ የጥቃቅንና አነስተኛ የእንጨትና የብረት ስራ ኢንዱስትሪዎች ውስጥ የሚሰሩ ሰራተኞች ላይ የሚደርሱትን ከሙያ ጋር የተያያዙ ጉዳዮችንና መንስኤዎቻቸውን ለይቶ ማወቅ ይረዳ ዘንድ የተዘጋጀ መጠይቅ ነው።

የመጠይቁ መለያ ቁጥር _____ የኢንዱስትሪው አይነት-----

የኢንዱስትሪው ስም ----- ቀበሌ-----

የምርት ውጤት-----

ቃለ መጠይቁን ከማድረግ በፊት የተሳታፊዎች ፈቃድ መጠየቅ ቅፅ

ሰላምታ:- ጤና ይስጥልኝ፣ እኔ _____ እባላለሁ። እዚህ የመጣሁት ይህንን ጥናት ለማካሄድ የደብረ ብርሃን ዩኒቨርሲቲ የጥናት ቡድን ሆኜ ነው። ከዚህ በመቀጠል ከስራ ጋር በተያያዘ ባለፉት 12 ወራት ውስጥ የደረሰብዎትን ጉዳዮችን በተመለከተ የተወሰኑ ጥቁዎችን ልጠይቅዎት እወዳለሁ። ከዕርስዎ የሚገኘው መልስ በሀገራችን ለሚከናወነው የሙያ ደህንነት ጤንነትና የስራ አካባቢ አገልግሎትን ለማሻሻል ከፍተኛ እገዛ ይኖረዋል።

ከዕርስዎ የምናገኛቸውን ማንኛውንም መልሶች በሚስጥር እንጠብቃለን። ከዚህ ጥናት ጋር በተያያዘ በማንኛውም በታና ጊዜ ስምዎ እንደማይፀናና እንደማይገለፅ ልንገልፅልዎት እንወዳለን። በአጠቃላይ መጠይቁ ወደ 30 ደቂቃ ገደማ የሚወስድ ሲሆን በጥናቱ የምናሳትፍዎት የእርስዎን ሙሉ ፈቃደኝነት ስናገኝ ብቻ ነው። በመጠይቁ ሂደት መመለስ የማይፈልጉት ጥያቄዎች ያለመመለስ መብትዎ የተጠበቀ ነው።

በጥናቱ ለመሳተፍ ፈቃደኛ ነዎት

1. አዎ----- ወደሚቀጥለው ይሻገሩ።
2. የለም----- ፈቃደኛ ያልሆኑበትን ምክንያት በመፃፍ ወደ ሌላ ተጠያቂ

ፈቃደኝነትን ያረጋገጠው የጠያቂ መለያ ቁጥር----- ስም-----ፊርማ-----
ቀን-----

መጠይቁ የተሞላበት ቀን----- የተጀመረበት ሰዓት----- የተጠናቀቀበት ሰዓት-----

ስለመረጋገጡ የተቆጣጠረው ስም----- ፊርማ----- ቀን-----
-

- ውጤት:-
1. ተጠቃሷል
 2. ተጠያቂው አልተገኘም
 3. ተጠያቂው ተቃውሟል
 4. በከፊል ተጠናቋል

ክፍል አንድ፡-ማህበራዊና ስነ-ሕዝባዊ ገጽታዎችን በተመለከተ

ተ/ቁ	ጥያቄዎች	አማራጭ መልሶች	ይሻገሩ	ኮድ
101	የታ	1. ወንድ 2. ሴት		
102	እድሜ	-----		
103	ሀይማኖት	1. ኦርቶዶክስ 2. ሙስሊም 3. ፕሮቴስታንት 4. ካቶሊክ 5. ሌላ፡ ይጠቀስ(-----)		
104	የትምህርት ደረጃ	1. ማንበብና መፃፍ የማይችል/ትችል 2. ማንበብና መፃፍ 3. የመጀመሪያ ደረጃ ትምህርት(1-8) 4. የሁለተኛ ደረጃ ትምህርት(9-12) 5. ሙያና ቴክኒክ 6. የመጀመሪያ ድግሪና ከዚያ በላይ		
105	የጋብቻ ሁኔታ	1. ያገባ/ች 2. ያላገባ/ች 3. የፈታ/ች 4. የሞተችበት/ባት 5. ተነጣጥለው የሚኖሩ		
106	የቅጥር ሁኔታ	1. በጊዜያዊነት 2. በቋሚነት		
107	የሙያ አይነት	-----		
108	በስራዎ ስንት አመት አገለገሉ?	-----		
109	የቀን ገቢ	-----		
110	የወር ገቢ	-----		

ክፍል ሁለት፡- የስራ ላይ ጉዳትን በተመለከተ

ተ/ቁ	ጥያቄዎች	አማራጭ መልሶች	ይሻገሩ	ኮድ
201	ባለፉት ሁለት ሳምንታት ከስራዎ ጋር በተያያዘ የደረሰባቸው ጉዳት አለ	1. አዎ 2. የለም	የለም ካሉ ወደ ጥያቄ ቁጥር 203 ይሻገሩ	
202	አዎን ከሆነ ስንት ጊዜ	-----		
203	ባለፉት አስራ ሁለት ወራት ውስጥ ከስራዎ ጋር በተያያዘ የደረሰባቸው አደጋ አለ?	1. አዎ 2. የለም	የለም ካሉ ወደ ክፍል 3 ይሻገሩ	
204	አዎን ከሆነ ስንት ጊዜ	-----		
205	ጉዳት የደረሰበት የሰውነትዎ ክፍል	a. አይን 1.አዎ 2.የለም b. ጥርስ 1.አዎ 2.የለም c. እጅ 1.አዎ 2.የለም d. ጆሮ 1.አዎ 2.የለም e. ጉልበት 1.አዎ 2.የለም f. እግር 1.አዎ 2.የለም g. የእግር ጣት 1.አዎ 2.የለም h. ራስ 1.አዎ 2.የለም i. የላይኛው ክንድ 1.አዎ 2.የለም j. የታችኛው ክንድ 1.አዎ 2.የለም k. ከጉልበት በላይ ያለው እግር 1.አዎ 2.የለም l. ከጉልበት በታች ያለው እግር 1.አዎ 2.የለም m. ጀርባ 1.አዎ 2.የለም n. ደረት 1.አዎ 2.የለም o. ሌላ ካለ ይገለፁ-----		
206	የጉዳቱ አይነት	1. ጭረት 1.አዎን 2.□ለም 2. መቆረጥ 1.አዎን 2.□ለም 3. ቃ□ሎ 1.አዎን 2.□ለም 4. መወጋት 1.አዎን 2.□ለም 5. ስብራት 1.አዎን 2.□ለም 6. ወለም□ 1.አዎን 2.□ለም		

		7. አይን ላይ የደረሰ ጉዳት 1.አዎን 2.□ለም 8. ጆሮ ላይ የደረሰ ጉዳት 1.አዎን 2.□ለም 9. መታፈን 1.አዎን 2.□ለም 10. በኤሌክትሪክ መያዝ 1.አዎን 2. □ለም 11. የአካል መቶ□ል 1.አዎን 2.□ለም 12. መመረ□ 1.አዎን 2.□ለም 13. ሌላ ካለ □□ ቀስ		
207	ጉዳቱ በደረሰበት ወቅት ምን ሲሰሩ ነበር	-----		
208	የጉዳቱ ምክንያት	1.ማሸኞች 1.አዎን 2.□ለም 2.በሚወቅቱ እቃዎች በመመ□ት 1አዎን 2.□ለም 3.ኤሌክትሪክ 1.አዎን 2.□ለም 4.በተፈናጣሪ ነገሮች 1.አዎን 2.□ለም 5.□□ፀ መሣሪያዎች 1.አ- ን 2.□ለም 6.አት 1.አዎን 2.□ለም 7.አሲድ □ና ትኩስ ነገሮች 1.አዎን 2.□ለም 8.መ□ □ቅ 1አዎን 2.□ለም 9.ግጭት 1.አዎን 2.□ለም 10.ከባድ □ቃዎችን በማንሳት 1.አዎን 2.□ለም 11.ሌላ ካለ □□ ቀስ		
209	ጉዳቱ የደረሰበት ሠዓት	1.ጧት 1.አዎን 2.□ለም 2.ከሣዓት 1.አዎን 2.□ለም 3.ማታ 1.አዎን 2.□ለም 4.ለሊት 1.አዎን 2.□ለም		
2010	በ□ረሰብ- ት ቶዳት ምክንያት በ□,ና ተቋም ተኝተ□ □□መው ያውቃለሁ;	1.አዎን 2.□ለም		
211	210 አዎን ከሆነ ለስንት ሰ□ት	1. ከ24 ሰዓትና ከዚያ በታች 2. 24 ሰዓት በላ□		
212	ከሥራ ፉር በተጸጸ□ ጉዳቶች ምክንያት ባለፉት አስራ ሁለት ወራት ውስጥ ከሥራ □ቀሩበት ቀናት ብዛት	-----		

ክፍል ሶስት፡ የስራ ቦታን በተመለከተ

ተ/ቁ	ጥያቄዎች	አማራጭ መልሶች	ይሻገሩ	ኮድ
301	በሳምንት ምን ያክል ሠዓት <input type="checkbox"/> ሰራሉ?	-----		
302	<input type="checkbox"/> ሥራ በ <input type="checkbox"/> ቁጥጥር ተ <input type="checkbox"/> ገደብ ጸወቃል?	1.አዎን 2.የለም		
303	<input type="checkbox"/> ሥራ ቦታን ደህንነትን በተመለከተ አዲስ ሆነው ሲቀጠሩ ወይም በአዳዲስ አሰራሮች ወይም በሌሎች ለውጦች ምክንያት ሥልጠና ወስደው ጸ <input type="checkbox"/> ቃሉ?	1.አዎን 2.የለም		
304	የሚሰሩበት ኢንደስትሪ የአደጋ ሁኔታን የሚገለጹ ምላክቶች አሉት?	1.አዎን 2.የለም		
305	በኢንደስትሪው የሚሰሩ ሰራተኞች ብዛት	-----		
306	የኢንደስትሪው አይነት	1.ጥቃቅን 2.አነስተኛ		
307	በኢንደስትሪው ውስጥ የስራ ፈረቃ አለ	1.አዎን 2. <input type="checkbox"/> ለም		
308	የሚሰሩበት ማሽን ከላል አለው?	1.አዎን 2. <input type="checkbox"/> ለም		
309	የሚሰሩበት ኢንደስትሪ አስፈላጊ የሰውነት መከላከያ መሳሪያዎች አሉ?	1.አዎን 2.የለም		

□ሥራተኞችን ስነባህሪ በተመለከተ

ተ/ቁ	ጥያቄዎች	አማራጭ መልሶች	ይሻገሩ	ኮድ
401	አልኮል መጠጥ ጠጥተዉ ጸ□ ቃሉ?	1. አዎን 2. □ለም	የለም ካሉ ወደ ጥያቄ ቁጥር 403 ይሻገሩ	
402	መልስዎ አወን ከሆነ በሳምንት ምን ያክል መጠጥ ይጠጣሉ?;	-----		
403	ጫት ቅመዉ ያወ.ቃሉ?	1.አዎን 2.□ለም	የለም ካሉ ወደ ጥያቄ ቁጥር 405 ይሻገሩ	
404	መልስዎ አዎን ከሆነ በሳምንት ምን ያህል ቱ□?	-----		
405	ሲፋራ ጸጨሳሉ?	1.አዎን 2.□ለም		
406	መልስዎ አወን ከሆነ በቀን ምን ያህል ሲጋራ የጨሳሉ?	-----		
407	በስራ ስ□ □እንቅልፍ ችግር አለብዎት?	1.አዎን 2.□ለም		
408	ሰራተኛወ፡ በስራ ስ□ የሰውነት መከላከያ መሣሪያዎች □□ ቀማሉ?	1.አዎን 2.□ለም	□ለም ካሉ ወ□ ተ.ቁ 410 □ሻቶ.	
409	□ግ.□ ቀሙ ከሆነ ምን አይነት?	1.ጓንት 1.አዎን 2.□ለም 2.የጀሮ መከላከያ 1.አዎን 2.□ለም 3.የአፍንጫናአፍ መከላከያ 1.አዎን 2.□ለም 4.የጭንቅላት መከላከያ 1.አዎን 2.□ለም 5.□ሥራ ልብስ 1.አዎን 2.□ለም 6.የብዩዳ መነጻር 1.አዎን 2.□ለም 7.የፊት መከላከያ 1.አዎን 2.□ለም 8.ቦቲ ጫማ 1.አዎን 2.□ለም 9.ሌላ ካለ □□ ቀስ		
410	የማይጠቀሙ ከሆነ ምክንያት- ምንድን ነዉ?	1.የመከላከያ መሣሪያ-ች ባለመኖራቸዉ ምክንያት		

		2.የደህንነትና ጤና ትምህርት ስለማ□ሠዓ 3.ለአጠቃቀም ምቹ ስላልሆነ 4.የሥራ አፈፃፀምን ስለሚቀንስ 5.የደህንነትና የጤናጠንቅ ሊያስከትል ስለሚችል 6.ሌላ ካለ □□ ቀስ		
411	የሰውነት መከላከያ መሳርያውን ከየት ነው የሚያገኙት(ካንድ በላይ መልስ መስጠት ይቻላል)	1.ከተቋሙ 2.እራሴ እገዛዋለሁ 99. ከሌላ/ይጠቀስ/ -----		

ሠራተኞች በስራቸው ደስተኛ ስለመሆናቸው ለማረጋገጥ የተዘጋጀ መጠይቅ

ተ.ቁ	ጥያቄዎች	በ□ም □ስማማለሁ(5)	□ስማማለሁ(4)	አላውቅም(3)	አልስማማም(2)	በ□ም አልስማማም(1)
412.1	በሰራሁት ጥሩ ስራ □ውቅና አግኝቻለሁ					
412.2	ከሰዎች ጋር በቅርብት □ንደምሰራ □ሰማኛል					
412.3	□ዚህ አገልግሎት ውስጥ በመስራተ □ስተኛ ነኝ					
412.4	በስራዬ ላይ ደህንነት □ሰማኛል					
412.5	አሰሪዎቼ ስለኔ ደህንነት ጥንቃቄ ያደርጋለሁ					
412.6	በአጠቃላይ ስራዬ ለጤንተ ዓሩ ነው ብዬ አምናለሁ					
412.7	ዓሩ ክፍያ ይከፈለኛል					
412.8	በስራዬ ያለኝን አቅምና ክህሎት □□ ቀማለሁ					
412.9	ከአለቃዬ ጋር ተግባብቻ □ሰራለሁ					
412.10	በስራ□ □ስተኛ ነኝ					

የሰራተኞችን የደህንነት ትግበራ ለመለካት የተዘጋጀ መጠይቅ

ተ.ቁ	ዓጻቁ- ች	የሚጠበቁ መልሶች		
		አ-	<input type="checkbox"/> ሎም	አይ <input type="checkbox"/> ወቅም
413.1	ሠራተኛው በስራ ወቅት የሰውነት መከላከያ ይጠቀማል/ትጠቀማለች			
413.2	ሠራተኛው ከስራ በኋላ የሰውነት መከላከያ መሳሪያ- ችን በትክክለኛው፣ በ <input type="checkbox"/> ጸስቀም <input type="checkbox"/> ል/ለች			
413.3	ሠራተኛው፣ <input type="checkbox"/> ስራ መሳሪያ- ቹን <input type="checkbox"/> ና <input type="checkbox"/> ስራ አንባቢውን ጸና <input type="checkbox"/> ል			
413.4	ሠራተኛው የአሰራር ቅደም ተከተሎችን ተከትሎ ስራውን ይሰራል			
413.5	ሠራተኛው አደጋ የሚያስከትሉ ሁኔ <input type="checkbox"/> - ችን ሪ <input type="checkbox"/> ርት ጸ <input type="checkbox"/> ርፉል			
413.6	ሠራተኛው በስራ ቦታ ለአርሱም ሆነ ሌሎች ሰራተኞች ላይ ጉዳት የሚያስከትሉ ሁኔታዎችን ለቅርብ ሃላፊው ሪፖርት ያደርጋል			
413.7	ሠራተኛው የደረሰበትን ማንኛውንም የስራ ላይ ጉዳት ሪፖርት ጸ <input type="checkbox"/> ርፉል			
413.8	ሠራተኛው የማሽን ብልሽትን ሪፖርት ያደርጋል			
413.9	ሠራተኛው የሰውነት መከላከያ መሳሪያ- ች <input type="checkbox"/> ንዲሰ <input type="checkbox"/> ት <input type="checkbox"/> ቃል			
413.10	ሠራተኛው የተለጠፉ የደህንነት ምልክቶችን በትክክል ይጠቀማል			

Annex 3: checklist for observation of working environment

Debre Berhan University College of Health sciences Department of public Health

Checklist for observation of working Environment in small scale industries in Debre Berhan town Checklist identification number: _____ Identification

Name of industry_____Type of industry -----

Final product_____

Address: Kebele_____

Total number of employees directly involved in production processes_____

s.no.	Questions	Possible options		Remark
		yes	No	
1.	Is there excessive heat in the workplace?			Yes, requires that a worker is found sweating when naked or with light clothing; if investigator feels as sudden heat wave when entering into the industry
2.	Is there excessive dust in the workplace?			Yes, requires if the investigator experiences sudden sneezing upon entering the industry or if the worker's eye brows, hair, nostrils and cloths is observed by investigators to be covered with dust particle
3.	Is there excessive noise in the workplace?			Yes, requires that it difficult to communicate with nearby worker without shouting
4.	Is there warning signs or safety rules?			Yes, requires no lack of such arrangement at inspection around.
5.	Do the employees use the necessary personal protective equipment?			Yes, requires no lack in use of safety devices seen at inspection around
6.	Does all production equipment have the appropriate protective arrangements?			Yes, requires no lack of such arrangement (poorly installed electric wire or unguarded machine or equipment) at inspection around

7.	Does the industry have copy of the most important safety and health regulations?			yes ,requires a copy of the regulation
8.	Does the industry have of health and safety personnel?			Attainment of yes, requires either implementation as result of initiative from health and safety personnel or written programme for action worked out with them.
9.	Does the industry follow written health and safety plan for action in the workplace?			Yes, requires completion of at least one of the measures in the plan
10.	Does the industry have first aid equipment?			Yes, requires that first –aid equipment be available in the production area and that content be as prescribed

This is the end of our observation. Thank you very much for taking time to answer these questions.

We appreciate your help.

Name of inspector _____

Signature_____Date_____