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Research Article

Prevalence Of Occupational Injury And Associated Factors Among Building Construction Workers In Shambu Town, Western Ethiopia

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Abstract

An occupational injury is any physical injury condition sustained on a worker in connection with the performance of his or her work in the industry. Employed people in industries spend at least one third of a day at work which have a strong effect on their health and safety due to work and work-related injuries.

An institution based cross-sectional study was conducted in Shambu town among building construction workers from August 02 to September 02, 2021. Simple random sampling technique was used to select 372 study subjects. Data was collected by face to face interview and using checklist. Data was entered using Epi-data version 4.4.3.1, and analyzed using SPSS statistical package for windows, version 25.0.Variables with p-value <0.05 was included in the final model and independent variables with a p-value <0.05 was considered statistically significant and predictor of occupational injury among building construction.

The overall prevalence of occupational injury among building construction workers was 43.02% [95 % CI: (38.47%, 47.69%)] in the past 12 month. Work experience [AOR; 2.05, 95% CI: (1.19, 3.55)], sleep quality [AOR; 2.80, 95% CI: (1.67, 4.69)], safety practice [AOR; 1.70, 95% CI: (1.09, 2.63)], work hour [AOR; 1.86, 95% CI: (1.19, 2.92)], and workplace supervision [AOR; 2.11, 95% CI: (1.29, 3.43)]were found to be significantly associated with occupational injury.

The prevalence of occupational injury among building construction workers in Shambu town is higher compared to other studies. Factors like work experience, sleep quality, safety practice, work hour and workplace supervision had influence on occurrence of occupational injury among building construction workers according to this study. To mitigate loss of life and productive time, necessary intervention must have to be implemented. Therefore, programs to decrease the burden of occupational injuries should have to focus on promoting safety practice (including use of personal protective equipment, warning signs and safe walkways), promoting workplace supervision, providing training for less experienced workers, and monitoring employees working hour. Furthermore, interventions on behavior related factors like improving sleep quality of workers have to be considered.

Keywords: Occupational injury, associated factors, construction worker

Introduction

According to WHO Occupational health is defined as "The promotion and maintenance of the maximum level of physical, mental, and social well-

being of workers in all occupations," and it views occupational health services to be responsible for the whole worker and, if possible, his or her family(Päivi Hämäläinen JT& TBK,2017; Rosenstock *et.al*,200, Verbeek,2007). An occupational injury is defined as any physical harm incurred by an individual while doing his or her job duties (Lette,2019 *et a*l; Hanna,2017 *et.al*). Any physical damage incurred by a person while performing his or her job in the industry is referred to as an occupational injury. Working individuals spend at least one-third of their day at work, which has a significant impact on their health and safety as a result of work and job-related injuries (Aderaw,2011 *et.al*;Dong,2015 *et.al*).

The health and safety conditions on construction sites have greatly improved in recent decades, yet hazardous working conditions remain on most sites, and as a result, workers are at still at high risk for injury and illness (Harvard TH,2015;).Construction is one of the world's major industries, meeting the demands of sometimes rapidly growing economies as well as requirements for normal building, renovation, maintenance and demolition programs in all countries(Organization IL,2005; Kiconco,2019 *et.al,* Lette ,2019). The construction industry has been considered an accident-prone industry. That is because construction sites are often filled with potential hazards that can lead to serious injury or death (Berhanu,2019 *et.al;* Gebremeskel and Yimer,2019). Each year, an estimated two million women and men die as a result of occupational accidents and work-related diseases. Across the globe, there are some 270 million occupational accidents and 160 million work-related diseases each year (Somavia,2005; Tözer,2018 *et al*)

Each year around 60,000 fatal accidents occur on construction sites worldwide. This means one fatal accident occur every ten minutes on construction site. In every six fatal accidents that occur in work place one occurs on a construction site. In industrialized countries, even though the construction sector employs only less than 10% of the labor force, around 25% to 40% of occupational death occurs in construction sites (Somavia,2005; Tolera,2016)

Every year 54,000 workers die and 42 million occupational injuries occur in sub-Saharan Africa, that cause at least three days' absence from work(Tekele and Kebede,2017; Tadesse and Israel,2016).The majority of developing country like Ethiopia, occupational health and safety aspect has been given less attention and workers who have been done in construction industry are work- related injury occur very high. This is due to illiteracy, poverty, lack of health, and safety training and information on health hazards and risks at the workplace (Fekele, 2016 *et.al;* Adane,2013 *et al*).

Methodology

This study was conducted in Shambu town from July 15 to August 15 which is the capital city of Horro Guduru Wollega Zone Oromia region. It has an estimated a total population of 125,222.The town is located at a distance of 314km from a capital city Addis Ababa. The town is divided into-two sub-city and has 4 Gandas(smallest administrative level in Ethiopia). Regarding construction, according to information obtained from Horro Guduru Wollega zone urban development and construction office there were 8 active building construction sites constructed by grade 1-8 licensed construction firms and 12 construction site constructed by grade 9 and above contraction firms as of June 2021.In the town there were 1198 construction workers(Shambu Administration office,2021).

An institution based cross-sectional study design was used. All individuals currently working in building construction sites in Shambu town. All workers who were involved in the selected building construction sites were considered as the study population. Individuals who works in selected building construction sites, in those general contractors firm, were included. Administration and office staff were excluded and also building construction workers who were unable to respond were excluded.

For the first objective, the sample size was calculated by using single proportion formula based on the following assumption, considering proportion of occupational injury of previous study done in Dessie town, Northeast Ethiopia, which showed 32.6% prevalence of occupational injury among construction workers(Gebremeskel ad Yimer,2019).

$$n = \frac{z_{\frac{\alpha}{2}}^{2} p(1-p)}{d^2} = 338$$

By adding 10% non-respondent rate n=372

- Where sample size Proportion of work-related physical injury score = 32.6%
- Z α/2- standard normal distribution = 1.96
- CI- Confidence interval = 95%
- D-margin of error n= (1.96)2 (0.5) = 338.
- Adding 10% non-respondent rate the total sample size for the first objective is 372
- Sample size for second objective was calculated by Epi info version 7 using double population proportion formula assuming 95% confidence level and 80% power of the study (Table.1).

Table 1. Sample size determination using factors associated with occupational injury among construction site workers in Shambu town, western Ethiopia 2021

Variables	AOR	Power	% of outcome in unexposed	95% CI	Ratio (Unexposed:exposed)	N	N+10% nonresponse	Reference
Worker experience	2.79	80%	47%	1.72-4.53	1	144	159	(6)
Alcohol drinker	3.16	80%	50.3%	2.09-4.79	1	122	135	(6)
Training on OSH	3.36	80%	24%	1.54-7.33	1	110	121	(2)
Work hour	2.02	80%	35%	1.14-3.58	1	286	315	(2)
Not using PPE	3.04	80%	25.5%	1.65-5.60	1	128	141	(2)

The study was carried out in five randomly selected active building construction sites, which has been constructed by grade 1-8 licensed construction firms, in Shambu town. The sites was randomly selected by the lottery method. Thereafter, the total sample size was proportionally allocated for the 5 randomly selected construction sites based on their average number of workers they have during data collection. Using workers in the registration book as a sampling frame, the participants were drawn from the site's list of workers using simple random sampling by the computer used lottery method.

The sample size for each building construction site (n_{inst}) was calculated as follow:

$n_{inst} = (N_{inst} * n) / N$

Where:

n_{inst} = sample size to be assigned for specific construction site

N_{inst} = number of workers in the specific construction site

n = total sample size

N = total number of workers in selected construction sites

Accordingly, sample size for sites; based on the fore mentioned formula.

1. Furgugge office construction site: $n_{inst} = (N_{inst} * n) / N = (125 \times 372) /488 = 95$
2. Wabii teaching class construction site: $n_{inst} = (N_{inst} * n) / N = (93 \times 372) /488 = 71$
3. DMD zonal office construction site: $n_{inst} = (N_{inst} * n) / N = (81 \times 372) /488 = 62$
4. Meelbaa dormitory block construction site: $n_{inst} = (N_{inst} * n) / N = (97 \times 372) /488 = 74$
5. Milkii assembling construction site: $n_{inst} = (N_{inst} * n) / N = (92 \times 372) /488 = 70$

3. Results

3.1. Socio-demographic characteristics

Three hundred sixty five (365) construction workers participated in the study making the response rate of 98.1%. Of whom 66.67% were males. The mean (±SD) age of respondents was 25.80 (±6.00) years, among which 334 (91.5%) were in 25–49 years age group. The majority of the participants 223 (61.04%) was singles (not married).Among the study participants, 144 (39.41%) of them have only primary school education. Two hundred and eighty eight (76.35%) of the respondents had working experience of less than or equal to two years. The majority of respondents 179 (49.10%) were daily laborers. Three-fourths of the participants had a monthly salary of Birr 2000- 3999 (Table.2).

Table 2: Socio-demographic characteristics of building construction workers in Shambu town, Ethiopia, 2021.

Variables		Frequency (n)	Percent (%)
Sex	Male	244	66.67
	Female	121	33.33
Age (years)	< 18	7	2
	18 – 24	22	6
	25 – 49	334	91.5
	≥ 50	2	.5
Marital status	Single (not married)	223	61.04
	Married	135	37.04
	Divorced or Widowed or Separated	7	1.92
Religion	Orthodox	135	37
	Protestant	208	57
	Muslim	18	5
	Others*	4	1
Educational status	No formal education	3	0.8
	Primary school	144	39.41
	Secondary school	70	19
	Diploma and Above	149	40.79
Employment status	Temporary	261	71.4

	Permanent	104	28.6
Experience	≤ 2 years	288	76.35
	>2 years	77	23.65
Type of work	Daily laborer	179	49.10
	Plasterer	38	10.36
	Carpenter	59	16.
	Mason	59	16
	Welder/electrician	11	2.93
	Painter	2	0.68
	Driver/operator	10	2.70
	Site engineer	7	2.03
Average Monthly income (Birr)	1000 - 1999	63	17.12
	2000 - 3999	373	74.77
	Above 4000	30	8.11

(* Jehovah's Witness and had no religion)

3.2. Behavioral related characteristics

Among the study participant, 27.93% were khat chewer. Regarding alcohol consumption and cigarette smoking, 12.16% and 7.66% of the workers were alcohol drinker and cigarette smoker respectively. One hundred and thirty four (38.29 %) of the respondents reported that they had good knowledge on occupational safety and health. From the total respondents, majority of 246 (67.34%) of them had poor sleep quality. Among 365 construction workers who participated in the study, 192 (52.70%) of them have good occupational safety practice (Table 3).

Self-reported availability of PPE by workers was ascertained by observation. A relationship between the observation and self-report were tested and the result shows there is a relationship between self-reported PPE availability and observation (Table 3). The observation also shows workers adherence to some of safety procedure; from the observation only 19.59% of workers use proper manual lifting technique and 55.63% of workers follow demarcated walkways.

Table 3: Behavioral characteristics of building construction workers of Shambu town, Ethiopia, 2021.

Variables		**Frequency (N)**	**Percent (%)**
Khat chewer	Yes	102	27.93
	No	263	72.07
Alcohol drinker	Yes	44	12.16
	No	321	87.84
Cigarette smoker	Yes	28	7.66
	No	337	92.34
Knowledge on OSH	Good Knowledge	140	38.29
	Medium level Knowledge	94	25.68
	Poor Knowledge	132	36.04

Attitude on OSH	Positive Attitude	249	68.24
	Negative Attitude	116	31.76
Sleep quality	Good Sleep Quality	119	32.66
	Poor sleeper quality	246	67.34
Job satisfaction	Yes	174	47.75
	No	191	52.25
Safety practice	Good	192	52.70
	Poor	173	47.30

Table 4: Comparison between self-reported PPE available and observation.

Personal Protective Equipment	**Self-reported PPE available**		**Observed PPE usage**		**Chi-square P value ***
	N	%	N	%	
Glove	76	20.70	58	16.00	0.000
Helmet	12	3.15	9	2.48	0.000
Overall	25	6.94	7	**21** 1.80	0.000
Goggle	6	1.58	4	1.13	0.000
Safety shoe	20	5.4	19	5.18	0.000
High visibility jacket	25	6.76	21	5.63	0.001

(* shows; self-report and observation are not independent)

3.3. Environmental related characteristics

Out of the total respondent, 59.91% of the employees had worked for more than eight hours per day. The majority 247 (67.57%) of employees reported workplace supervision had never occurred in the past 12 months. Regarding safety and health training, 284 (77.93%) of the respondent did not attend any kind of workplace safety and health training (Table 4). From those who had attended safety and health training, 40 (49.97%), 33 (40.81%), and 8 (10.2%) of them get the training from their workplace, from government and get from both their workplace and government respectively. For only 99 (27.25%) of the participant personal protective equipment were avail. Out of personal protective equipment available, 51.98% were gloves.

Table 5: Environmental characteristics of building construction workers of Shambu town, Ethiopia, 2021.

Variables		**Frequency (N)**	**Percent (%)**
Work hour per day	≤ 8 hr/day	146	40.09
	> 8 hr/day	219	59.91
Workplace supervision	Yes	118	32.43
	No	247	67.57
Safety and health training	Yes	81	22.07
	No	284	77.93
PPE available to workers	Yes	99	27.25
	No	267	72.75

3.5. Prevalence of injury and its characteristics

Out of 365 construction workers participated in this study, the overall prevalence of injury found was 43.02% (95% C.I: 38.47%, 47.69%) during the last 12 months. Out of injured respondent one hundred and eighteen (74.87%) of the injured respondents encountered more than one injury. The main types of injuries reported were cut/laceration 31.25%, back pain 23.95%, and abrasion/contusion 17.97% (Figure 2). The three leading causes of injuries were cut by sharp objects 38.62%, followed by hit by object 22.51%, and fall from ground level 11.25% (Table 5). From the total respondents most of injuries happened in fingers 30.63%, followed by trunk/chest 26.96% and feet 12.83% (Figure.4). In this study, the agent of occupational injury was hand tools 52.33%, fall 26.33%, lift 14%, machineries 5%, and others 2.3%. Majority of 47.09% of participant were handling materials during injury, followed by heavy lifting 32.11% and fixing wood 7.95% (Table 5). Among the total injured workers 11.52% were hospitalized, of which 31.82% were hospitalized for more than 24 hours. Around 32.46% of injured workers were absent from their work for more than 3 days (Table 6).

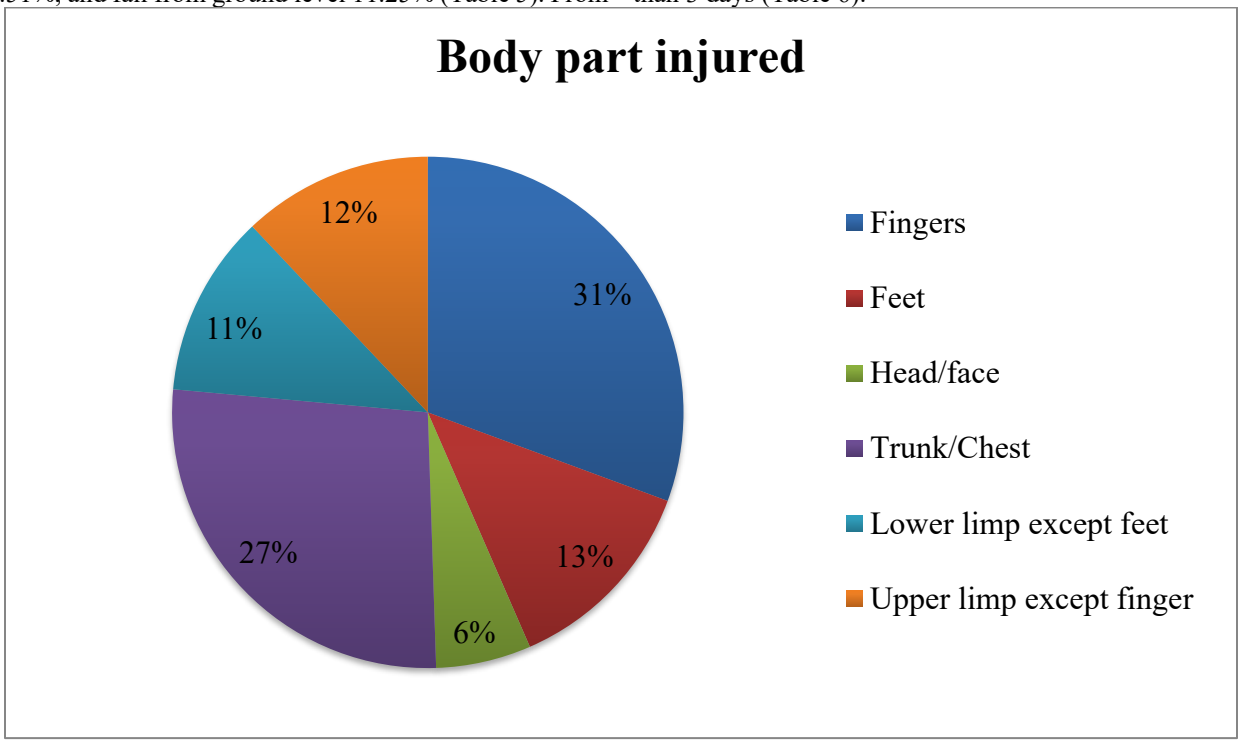

Figure 3: Body part injured among respondents in building construction sites, Shambu town, 2021.

Table 6: Cause of injury and type of activity during injury among building construction workers, Shambu town, 2021.

Cause of injury	Frequency	Percent (%)
Cut by sharp objects	124	38.62
Falling from ground level	36	11.25
Falling from height	25	7.93
Hit by object	72	22.51
Slipping	19	5.88
Contact electric line	7	2.05
lifting object	35	10.74
Others	3	1.02
Activity during injury		
Handling material	127	47.09

Heavy lifting	86	32.11
Operating machineries	12	4.59
Welding	8	3.09
Fixing wooden objects	21	7.95
Laying bricks	12	4.59
Others	2	0.61

Table 6: Severity of occupational injury among building construction workers Shambu town, 2021.

Variables		Frequency	%
Hospitalized (n=191)	Yes	18	11.52
	No	139	88.48
Days of hospitalization (n=22)	≤24 hours	12	68.18
	>24 hours	6	31.82
Days of absent from work (n=191)	≤3 days	106	67.54
	>3 days	51	32.46

Factors associated with occupational injury

The results of bivariable analysis revealed that educational status, employment status, work experience, work type, knowledge on OSH, attitude on OSH, sleep quality, job satisfaction, safety practice, work hour, workplace supervision, health and safety training, and PPE availability were found to be significantly associated with occupational injury.

In multivariable logistic regression, work experience, sleep quality, safety practice, work hour and workplace supervision were significantly associated with occupational injury. Model fitness was checked by Hosmer-Lemeshow goodness-of-fit test statistics. The Hosmer & Lemeshow test of the goodness of fit (p=0.727) suggests the model is a good fit to the data. Multicollinearity test was also checked using VIF test. The VIF test suggests that multicollinearity is not a problem for the data.

Multiple logistic regression analysis of risk factors showed that the odds of having occupational injury among workers who served for less or equal to 2 years were about 2.05 times more compared to those who served for more than 2 years [AOR; 2.05, 95% CI: (1.187, 3.554)]. The odds of injuries among employees who had poor sleep quality were about 2.79 times more compared to those who had good sleep quality [AOR; 2.79, 95% CI: (1.672, 4.686)]. Another important finding of this study was that the odds of injuries among employees who had poor safety practice were 1.69 times more compared to those who had good safety practice [AOR; 1.69, 95% CI: (1.094, 2.634)]. The odds of occupational injury were 1.86 times higher among workers working for more than 8 hours per day as compared to workers working for less or equal to 8 hours per day [AOR; 1.86, 95% CI: (1.187, 2.915)]. Among the participants, the odds of occupational injury who didn't receive workplace supervision were about 2.11 times higher than those who were receiving workplace supervision [AOR; 2.11, 95% CI: (1.29, 3.43)] (Table 1).

Socio-demographic related factors

The bivariable logistic analysis of socio-demographic characteristics with occupational injury revealed that educational status, employment status, work experience and work type were significantly associated with occupational injury. In multivariable logistic analysis only work experience was significantly associated with occupational injury (Table 7).

Table 1: Socio-demographic related factor associated with occupational injury among building construction workers in Shambu town by bivariable and multivariable logistic regression analysis, Ethiopia, 2021.

Socio-demographic related variables		Injured		COR (95% CI)	AOR (95% CI)
		Yes	No		
Educational status	No formal education	2	1	3.23 (0.28, 36.83)	0.88 (0.07, 11.06)
	Primary school	70	74	1.53 (0.93, 2.51)	0.59 (0.32, 1.12)

	Secondary school	53	81	1.06 (0.63, 1.76)	0.48 (0.26, 2.89)
	Diploma and Above	32	52	1.00	1.00
Employment status	Temporary	148	188	1.00	1.00
	Permanent	9	20	0.57 (0.22, 1.46)	3.21 (0.54, 19.28)
Work experience	≤ 2 years	137	141	3.28 (1.98, 5.42)	**2.05 (1.19, 3.55)***
	>2 years	20	67	1.00	1.00
Work type	Daily laborer	88	91	1.00	1.00
	Plasterer	12	25	0.50 (0.26, 0.98)	1.18 (0.53, 2.59)
	Carpenter	24	35	0.70 (0.40, 1.20)	1.73 (0.83, 3.63)
	Mason	21	37	0.59 (0.34, 1.04)	1.36 (0.65, 2.84)
	Welder/electrician	5	6	0.89 (0.29, 2.73)	3.21 (0.84, 12.25)
	Painter	1	2	0.52 (0.05, 5.81)	9.95 (0.73, 135.31)
	Driver/operator	3	7	0.52 (0.15, 1.77)	2.00 (0.44, 9.18)
	Site engineer	2	5	0.52 (0.13, 2.13)	0.52 (0.13, 2.13)

(* = a statistically significant variable at $p < 0.05$ in multivariable logistic regression analysis)

Behavioral related factors

The bivariable logistic analysis of behavioral related factors with occupational injury revealed thatknowledge on OSH, attitude on OSH, sleep quality, job satisfaction and safety practicewere significantly associated with occupational injury. In multivariable logistic analysis only sleep quality and safety practice were significantly associated with occupational injury (Table.8).

Table 8: Behavioral related factor associated with occupational injury among building construction workers in Shambu town by bivariable and multivariable logistic regression analysis, Ethiopia, 2021.

Behavioral related variables		**Injured**		**COR (95% CI)**	**AOR (95% CI)**
		Yes	**No**		
Knowledge on OSH	Good Knowledge	51	89	1.00	1.00
	Medium level Knowledge	35	59	1.02 (0.62, 1.66)	0.73 (0.41, 1.30)
	Poor Knowledge	72	60	2.08 (1.34, 3.23)	1.35 (0.79, 2.29)
Attitude on OSH	Positive attitude	90	159	1.00	1.00
	Negative attitude	67	49	2.37 (1.24, 3.94)	0.99 (0.61, 1.74)
Sleep quality	Good sleep quality	23	96	1.00	1.00
	Poor sleep quality	134	118	5.01 (3.13, 8.02)	**2.80 (1.67, 4.69)***
Job satisfaction	Yes	62	113	1.00	1.00
	No	95	95	1.83 (1.25, 2.68)	0.98 (0.59, 1.64)
Safety practice	Good	58	134	1.00	1.00

	Poor	99	74	3.06 (2.07, 4.52)	**1.70 (1.09, 2.63)***

(* = a statistically significant variable at p < 0.05 in multivariable logistic regression analysis)

Environmental related factors

The bivariable logistic analysis of environmental related factors with occupational injury revealed that work hour, workplace supervision, health and safety training and PPE availability were found to be significantly associated with occupational injury. In multivariable logistic analysis only work hour and workplace supervision were significantly associated with occupational injury (Table.9).

Table 9: Environmental related factor associated with occupational injury among building construction workers in Shambu town by bivariable and multivariable logistic regression analysis, Ethiopia, 2021.

Environmental related variables		**Injured**		**COR (95% CI)**	**AOR (95% CI)**
		Yes	**No**		
Work hour	≤ 8 hrs/day	41	105	1.00	1.00
	> 8 hrs/day	116	103	2.89 (1.92, 4.33)	**1.86 (1.19, 2.92)***
Workplace supervision	Yes	29	90	1.00	1.00
	No	128	118	3.37 (2.17, 5.26)	**2.11 (1.29, 3.43)***
Health and safety training	Yes	27	53	1.00	1.00
	No	130	155	1.66 (1.04, 2.65)	0.89 (0.47, 1.66)
PPE available	Yes	34	66	1.00	1.00
	No	123	142	1.69 (1.09, 2.62)	0.88 (0.51, 1.53)

(* = a statistically significant variable at p < 0.05 in multivariable logistic regression analysis)

Table 10. Factor associated with occupational injury among building construction workers in Shambu town by bivariable and multivariable logistic regression analysis, Ethiopia, 2021.

Variables		**Injured**		**COR (95% CI)**	**AOR (95% CI)**
		Yes	**No**		
Work Experience	≤ 2 years	137	141	3.28 (1.98, 5.42)	**2.05 (1.19, 3.55)***
	>2 years	20	66	1.00	1.00
Sleep quality	Good sleep quality	23	96	1.00	1.00
	Poor sleep quality	134	112	5.01 (3.13, 8.02)	**2.80 (1.67, 4.69)***
Safety practice	Good	58	134	1.00	1.00
	Poor	99	74	3.06 (2.07, 4.52)	**1.70 (1.09, 2.63)***
Work hour	≤ 8 hrs/day	41	105	1.00	1.00
	> 8 hrs/day	116	103	2.89 (1.92, 4.33)	**1.86 (1.19, 2.92)***
Workplace supervision	Yes	29	90	1.00	1.00
	No	128	118	3.37 (2.17, 5.26)	**2.11 (1.29, 3.43)***

(* = a statistically significant variable at $p < 0.05$ in multivariable logistic regression analysis)

Discussion

In this study, occupational injuries among building construction workers in the past 12 months were reported by 43.02% of construction workers (95% C.I: (38.47%, 47.69%)).The result isin line with the study conducted in Jimma town (41.4%)(Kaur,2019 et al; Lingard ,2013 *et al*), Robe town (39.2%) Kari Anne,2015), Gondar town (39%)(Arthur,2017 *et al*) and in Mit-Ghamr city, Egypt (46.2%)(Assefa,2014 *et al*).However, study conducted in China (69.82%)(54), and Ilam, West Iran, (82%)(Arthur,2017 *et al*) has reported higher prevalence of injury than this study. Moreover this current finding was relatively higher than the studies conducted in Kampala city, Uganda, (32.4%)(Heckman ,1967 *et al*), western Norway (27.5%) (Damtie and Siraj,2020), Dessie, Ethiopia, (32.6%)(Yessuf ,2014 *et al*), and Addis Ababa, Ethiopia, (38.3%)(Damtie and Siraj,2020). This discrepancy might be due to the difference in working environment, as well as difference in socio-demographic, economic development of the countries and levels of accident prevention strategies.

This study identified factors influencing the occurrence of occupational injury. The odds of injuries among employees who served for less or equal to 2 years were about two times more compared to those who served for more than 2 years[AOR; 2.05, 95% CI: (1.19, 3.55)].But this finding is inconsistent with findings in Addis Ababa, Ethiopia(Tadesse and Israel,2016; Moradinazar,2013). The possible explanation for work experience to be a factor for injury could be due to; less work experienced workers might be easily exposed for occupational injury, it might also be due those employees who served for greater than 2 years could be accustomed to the workplace environment and comply with safety precautions including proper use of PPE.

Another finding of this study is that the odds of injury among building construction workers who had poor sleep quality were about three times more compared to those who had good sleep quality [AOR; 2.80, 95% CI: (1.67, 4.69)]. This finding was similarly found in study done in Addis Ababa, Ethiopia(Tadesse and Israel,2016,), and Mumbai, India (Raymond,2017 *et a*l) .The possible reason behind this might be due to lose of concentration. Poor sleep quality problems affect the ability to concentrate and maintain wakefulness as well as the ability to assess the work environment and working conditions. For example, most construction workers live together in crowded small rented house and mostly they stay wake at the evening drinking alcohol, chewing khat or playing games, this leads to problem of waking up several times per night and staying sleep at morning, and this may disturb the sleeping pattern of workers.

The odds of injury among workers who had poor safety practice were about two times more compared to those who had good safety practice[AOR; 1.70, 95% CI: (1.09, 2.63)]. These result was consistent with the study done in Australia(Amissah,2019 *et al)*, and Mit-Ghamr city, Egypt (Zerguine ,2018 *et al;* Hussen,2020 *et al*). The reason why poor safety practice lead to injury might be due to; lack of workers' compliance with safe work practices including not obeying safe work procedure and negligence of using PPE, although PPE is the last measure in the hierarchy of hazard control method. The other reason might be due to PPE was not always available or not enough, because of the cost and comfort issue, also lack of awareness about its importance and use, or carelessness of the workers and employers.

In addition work hour showed statistically significant association with occupational injury. Construction workers who work for more than 8 hours per day are more affected by injury than workers who work for 8 hours or less per day. The odds of injuries among workers who works for more than 8 hours per day were about two times more compared to workers who works for only 8 hours or less per day[AOR; 1.86, 95% CI: (1.19, 2.92)]. This finding was similarly observed in other part of Ethiopia, in Gondar(Rajaprasad and Chalapathi,2016). and Jimma (Dai,2016 *et al*).The reason could be with long hours of work, there is a chance of developing fatigue; this could increase the chance of work related injuries. In addition, daily occupational exposure level to accident increases and this lead to injury.

Another finding of this study was that workplace supervision was reduced occupational injury. The odds of injuries among workers who hadn't workplace supervision were about two times more compared to workers who had workplace supervision [AOR; 2.11, 95% CI: (1.29, 3.43)]. This result is similar with studies conducted in Robe, Ethiopia(Dodo,2014) and Ilam, Iran (Hernández-Arriaza,2020 *et al*).The possible reason for this might be absence of instruction and supervision on the safe handling of tools, operation of machinery, process, and not to comply with safety and health regulations may lead to occupational injury.

Conclusion And Recommendations

The prevalence of occupational injury among building construction workers in Shambu town is higher compared to other studies. More than two-third of injured workers sustained more than one injury. Cut/laceration was the main type of injury. The leading cause of injuries was cut by sharp objects. Fingers/hand was the most hurt part of the body during injury; this indicates that PPE targeting extremities might reduce injury. One-third of injured workers were absent from their work for more than 3 days, this poses a big burden on both the health system and workers' families in economy perspective. Factors like work experience, sleep quality, safety practice, work hour and workplace supervision had influence on occurrence of occupational injury among building construction workers according to this study. Therefore, an intervention must be in place to mitigate this problem.

The workers should have to be restrained from activities which lead them to occupational injury, including not getting adequate sleep and not obeying safety procedures and measures (including use of personal protective equipment, respecting warning signs, using safe walkways and etc.). Employees must have to try to get sufficient sleep and rest before they went to work. Furthermore, they have to ask for their occupational safety and health rights at workplace.

The employers should have to provide training on occupational safety and health; this was increases workers awareness of dangers present at work site and improves their safety practice. The employers should also have to provide personal protective equipment to workers so that they perform their work in safe manner. Furthermore, they don't have to enforce the employees to work over time.

Ministry of Health, Oromia health bureau, Labor and Social Affairs bureau, Oromia house construction bureau and level one to eight contractors should have an integrated emphasis to reduce occupational injury by setting safety regulations on construction

industry. The Ministry of Labor and social affairs should assign occupational health and safety professionals for monitor working site that will important for reinforce and remind the basic health and safety matters fulfillment.

Contractors, who select employees during recruitment, should consider important socio-demographic and behavioral factors such as work experience, chewing chat and alcohol consumption status, etc. The supervisors of the construction area should try to identify the needs of workers continuously in order to assure their work satisfaction.

Workers should be conducted for regular monitoring of substance abuse in workplace and promote the use of personal protective equipment all times had significantly contributed to reduce risks of occupational injuries, Check and monitor substance use workers before they start their jobs. Further case-control and cohort study should be conducted especially on the employment type of workers and occupational injuries.

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