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Occupational Health and Safety Related Knowledge, Attitude and Practice among Wood and Metal Workers in Hawassa, Ethiopia

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Authors' contributions

This work was carried out by all authors. Author AE designed the study, wrote the protocol and wrote the first draft of the manuscript. Author HS performed the statistical analysis and author YM participated in updating and developing the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Background: Workplace accidents affect young people and developing countries share the largest job related incidences and diseases. Micro and small enterprises (MSE) are in rapid expansion in Ethiopia and they consist mostly of young age groups.

Materials and Methods: The study was conducted in Hawassa (Jan. to Mar., 2014), Ethiopia. The subjects were 382 respondents, all eligible workers at MSE wood and metal workshops in Hawassa. The study design was institution based cross-sectional and the data were collected by interviewing and administering semi-structured questionnaires which included demographic characteristics, and questions specifically designed to assess the knowledge, attitude and practice (KAP) of the study

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subjects. Knowledge and attitude were measured using composite score and data were analyzed using SPSS version 16 computer software to determine descriptive statistics.

Results: The response rate of the study was 92.7%. The majority, 84.9% (299), of the respondents was males and 15.1% (53) were females; 36.2% (128) were aged 25 – 29 years and 34.7% (123) completed secondary school. Regarding their work environment 94.2% (325) reported presence of excessive dust, 99.2% (350) disturbingly high sound, 89.5% (316) radiation from welding and 99.4% (338) used chemicals in the workplace during painting / spraying. Only 30.5% (108) knew that exposure to chemicals (inhaled sprays, spilled on body etc.) during work causes problem on health. Regarding knowledge related to occupational health and safety (OHS) 83.1% (294) responded 75% and above correctly while regarding attitude 87.2% (309) have shown to have 75% and above favorable attitude towards acceptable OHS principles. Concerning practice on using personal protective equipment (PPE) , out of the 6 PPE mentioned, only 37.3% (132) reported that they use three or more of them sometimes or always. Only 33.9% (120) and 5.4% (19) of the respondents reported that they had training on OHS before they started work and within the last one year respectively.

Conclusion and Recommendation: The overall knowledge, attitude and practice related to OHS MSE wood and metal workers in Hawassa pose a public health concern. This calls for urgent intervention in providing on job training as well as implementing safer work environment, medical checkups and improved pre-service training for new staff.

Keywords: Occupational health and safety; micro and small enterprises; Knowledge attitude and practice (KAP).

1. INTRODUCTION

Every year, International Labor Organization (ILO) reports that, job related accidents and diseases claim estimated 2.34 million lives of men and women giving daily loss of 6,300 lives due to work related causes. Moreover, 160 million occupational diseases are reported each year [1].

Industries should be well designed and appropriate safety measures should be adopted to avoid adverse health consequences to the workforce [2]. Studies in industrial countries reveal that the causing agent of 90% of workplace accidents is human error and only 10% of those belong to unsuitable workplace and equipment. Human factor includes lack of knowledge, lack of interest, negative attitude, unsafe behavior and incompetence [3].

In Ethiopia for instance, according to the Addis Ababa Trade and Industry Bureau reports (2005), there were about 179,000 MSEs employing about 251,081 workers, producing goods and services for low and middle income people of the country [4].

In Ethiopia the annual estimates of occupational accidents and fatalities are 4.3 million and 5,596 giving 16,426 accidents and 21.5 fatalities per 100,000 workers, respectively [5].

In Hawassa there are a total of 1,102 MSEs with 9,741 members of which 260 enterprises are in the manufacturing sector involving 1,791 members. Part of the enterprises represents the metal and wood industry. This gave good ground to investigate the OHS among wood and metal workers in Hawassa City.

2. MATERIALS AND METHODS

2.1 The Study Setting

The study was conducted in Hawassa, Ethiopia (Jan. to Mar., 2014). All the eight sub-cities were included.

2.2 Study Subjects

There were three hundred eighty two workers at the MSE wood and metal workshops.

2.3 Study Design

Institution, micro and small enterprise, based cross-sectional study.

2.4 Study Methodology

Data was collected through semi-structured questionnaires administered by way of interviewing. Demographic characteristics of the study population such as age, sex and education were included. Education was defined by the number of years of formal schooling.

The knowledge of the workers which included seven main questions covering knowledge about the workplace hazards, health problems related to these hazards, effects of dust on health, and protective measures and equipment was assessed. The attitude and practice of the workers towards the hazards including the availability of PPE; the type of equipment provided; the training and the frequency of using the PPE (All the time, sometimes, or never used them) were addressed.

All interviews were conducted face to face, at the beginning of the interview the objectives of the study were explained to each participant and informed written consent was obtained.

The data collectors were trained and close supervision was conducted to increase quality of data collection process and the questionnaire was pre-tested before the actual data collection.

2.5 Data Management and Analysis

Descriptive statistics was carried out to analyze data by using SPSS version 16 computer

software. Frequency distribution and percentage of response in each category were calculated.

2.6 Ethical Consideration

The investigation was conducted after ethical clearance was obtained from Hawassa University College of Medicine and Health Sciences Institutional Review Board. As per prior discussions with the organizers of the SMEs, the data collection was done at relatively relaxed times when the participants could take part in their free time.

3. RESULTS

3.1 Socio-Demographic Characteristics

Table 1 shows the socio-demographic data. The majority of respondents was males 84.9% (299), 36.2% (128) were between the ages of 25-29 years and 59.9% (212) were single in marital status. About 50% (177) were Protestant religion followers while 34.7% (123) completed secondary school (Table 1).

Table 1. Frequency distribution of Socio-demographic characteristic of Hawassa Wood and Metal workers

Socio demographics		Frequency	Percent
Sex	Male	299	84.9
	Female	53	15.1
Age	<20	71	20.1
	20-24	84	23.7
	25-29	128	36.2
	30-34	40	11.3
	+35	29	8.2
Marital status	Single	212	59.9
	Married	136	38.4
	Divorced	3	0.8
Religion	Orthodox	155	43.8
	Protestant	177	50.0
	Muslim	19	5.4
	Other	3	0.8
Educational level	Illiterate	4	1.1
	Read and write only	9	2.5
	Completed primary school	31	8.8
	Completed intermediate school (7 & 8)	109	30.8
	Completed secondary school	123	34.7
	Vocational	61	17.2
Cigarette smoking	On Job training	17	4.8
	Yes	45	12.7
	No	309	87.3

3.2 The Working Environment

Among the respondents 94.2% (325) reported presence of excessive dust and 99.2% (350) disturbingly high sound. Some 89.5% (316) reported that there was some kind of radiation from welding.

3.3 Raw Material Use

Table 2 shows different raw materials used by the workers. For example, paints were reported to be used by 333 (94.1%) workers, thinner by 327 (92.4%) and other chemicals by 124 (35%) (Table 2).

Table 2. Raw Materials' used in wood and metal work processes in enterprise

Raw material used	Yes number (%)	No number (%)
Chip wood	303(85.6)	51(14.4)
Metal	309(87.3)	45(12.7)
Lumber / wood	305(86.2)	49(13.8)
Anti-rust	302(85.3)	52(14.7)
Paints	333(94.1)	21(5.9)
Thinner	327(92.4)	27(7.6)
Other chemicals	124(35.0)	227(64.1)

3.4 Training on OHS

Only 120 (33.9%) of the respondents reported to have taken training on OHS before starting the work on metals and woods while 19 (5.4%) reported that they took training on OHS within the last 12 months.

3.5 Knowledge

Regarding the knowledge of the study subjects related to OHS they were asked to list some of the PPE and to answer fourteen questions related to OHS. Based on this, safety glasses or goggles were mentioned by maximum number, 321 (90.7%), of the respondents followed by gloves 202 (57.1%). Helmets were mentioned by the least, 12 (3.4%) number of the respondents (Table 3).

Considering the response for OHS related questions 252 (71.2%) reported that they know wood work and metal work can cause harmful effect to health while least number of respondents, 68 (19.2%), recognize the need for fire extinguishers (sand buckets) to be readily

available at the workshop. Similarly only few, 74 (20.9%), recognize damage by electricity as a potential hazard in the workshop (Table 4).

Table 3. Knowledge of workers on preventive measures and PPE

Knowledge of PPE to be used on work	Yes number (%)	No number (%)
Safety glasses or goggles	321(90.7)	33(9.3)
Gloves	202(57.1)	152(42.9)
Masks	153(43.2)	197(55.6)
Ear plugs	42(11.9)	308(87.0)
Safety shoes	142(40.1)	209(59.0)
Helmets	12(3.4)	337(95.2)
Others	242(68.4)	111(31.4)

When it comes to the source of knowledge related to OHS television, 209 (59.0%), and radio, 216 (61.0%), were found to be the leading sources (Table 5).

3.6 Attitude

Regarding the attitude of respondents on points related to OHS, six statements were presented to which they replied with strongly agree, agree, neutral, disagree and strongly disagree. Accordingly it was found that they have generally favorable attitude related to OHS especially on giving OHS training on yearly basis 345 (97.5%) and on monitoring the use of PPE 337 (95.2%) (Table 6).

3.7 Practice

Regarding the use of PPE some six PPE were listed and the study subjects were asked the frequency they use one or more of them. It was found that except for the eye glass, 86 (26.3%), over half of the respondents didn't use the PPE and especially ear plugs, 311 (95.1%), and helmets, 283 (86.5%), were not at all used by many of the respondents (Figure 1).

3.8 Occupational accidents

The study subjects were asked if they experienced occupation related accidents and were specifically assessed for presence of nine work related complaints. The result was that the highest complaint presented was cough 123 (34.7%) followed by redness of the eyes 81 (22.9%) while skin complaints were presented least (Table 7).

Table 4. Knowledge related to OHS

Statement	True number (%)	False number (%)	I don't know number (%)
Wood work and metal work can cause harmful effect to health.	252(71.2)	84(23.7)	18(5.1)
Exposure to wood dust causes problem on health	312(88.1)	24(6.8)	18(5.1)
The sound created during cutting wood / metal causes problem on health	306(86.4)	37(10.5)	11(3.1)
Radiation during welding causes problem on health.	336(94.9)	14(4.0)	4(1.1)
Radiation causes problem only to the eye.	108(30.5)	228(64.4)	18(5.1)
Exposure to chemicals (inhaled sprays, spilled on body) during work causes problem on health.	108(30.5)	228(64.4)	18(5.1)
Wearing Safety glasses or goggles can protect the eye from radiation during welding.	319(90.1)	19(5.4)	16(4.5)
Wearing gloves is important while working with chemicals.	343(96.9)	8(2.3)	3(0.8)
All types of gloves provide same level of protection.	332(93.8)	15(4.2)	7(2.0)
Fire extinguishers (sand buckets) should be readily available at our workshop.	68(19.2)	219(61.9)	67(18.9)
Air-conditioning for heat stress is important at our workshop.	328(92.7)	11(3.1)	15(4.2)
If spraying paint is done outdoor there is no more need for protection.	333(94.1)	15(4.2)	6(1.7)
Damage by electricity can be considered potential hazard in the workshop.	74(20.9)	201(56.8)	79(22.3)
Carrying larger load than you are able can be considered potential hazard in the workshop.	341(96.3)	10(2.8)	3(0.8)
Spilling of a slippery liquid be considered potential hazard in the workshop.	340(96.0)	10(2.8)	4(1.1)

Table 5. Source of information for knowledge related to OHS

Source of information	Yes number (%)	No number (%)
News papers	112(31.6)	242(68.4)
Radio	216(61.0)	138(39.0)
TV	209(59.0)	145(41.0)
Billboards	62(17.5)	292(82.5)
Brochures, posters, other printed materials	65(18.4)	289(81.6)
Family, friends, neighbors, colleagues	143(40.4)	211(59.6)
Teachers	23(6.5)	331(93.5)
Health workers	39(11.0)	315(89.0)
Others	6(1.7)	348(98.3)

Table 6. Attitude related to OHS

Attitude	Strongly agree number (%)	Agree number (%)	Neutral number (%)	Disagree number (%)	Strongly disagree number (%)
I think it is necessary to have medical checkups annually for work related disorders	261(73.7)	73(20.6)	8(2.3)	11(3.1)	1(0.3)
Workers need to be trained of using clothing, gloves, face mask, glass	214(60.5)	107(30.2)	21(5.9)	11(3.1)	1(.3)
I think I should not continue working if I lack personal protective equipment	30(8.5)	40(11.3)	11(3.1)	124(35.0)	149(42.1)
I think the current working environment (space, PPE availability) should be changed for the better health of the workers	168(47.5)	131(37.0)	15(4.2)	29(8.2)	11(3.1)
In my opinion health workers should monitor the use of clothing, gloves, face mask, glasses	182(51.4)	155(43.8)	8(2.3)	7(2.0)	2(.6)
At least once in a year training should be given to us on occupational health and safety	224(63.3)	121(34.2)	6(1.7)	2(.6)	1(.3)

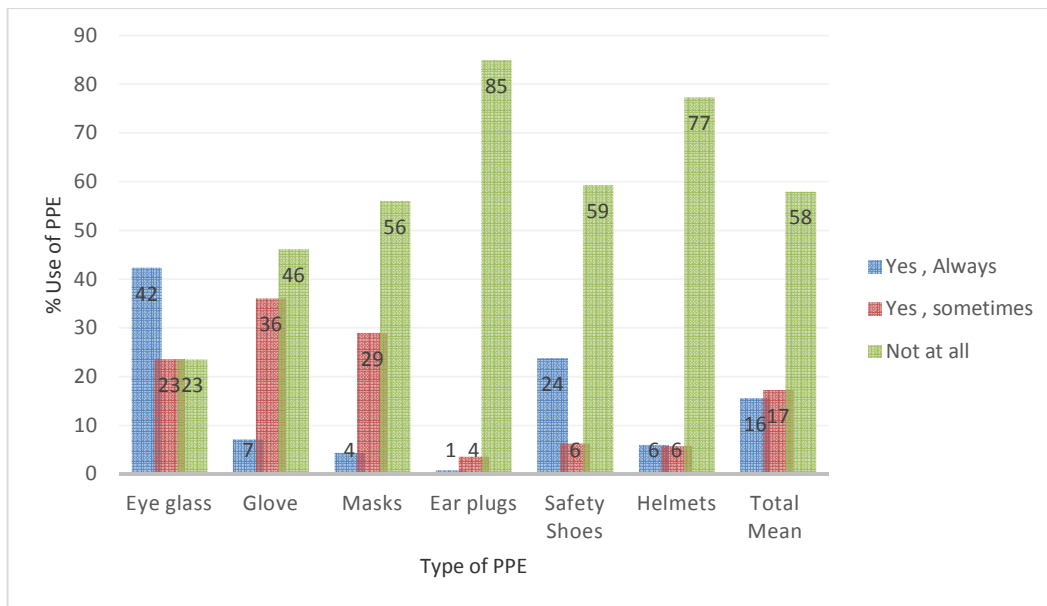


Figure 1. Percentage of practice related to the use of PPE

4. DISCUSSION

The findings of this study showed different levels of knowledge, attitude and practice of the MSE workers. For example there were only 33.9% of

the respondents who took training on OHS prior to their engagement in the work place. This result is generally consistent with reports that state only a small minority (5-10%) of the global workers has access to occupational health services [6].

Table 7. Occupational accidents among the study subjects

Occupation accidents	Yes number (%)	No number (%)
Physical Injuries (abrasions, lacerations, cut wounds, fall off forklift & heavy wood, sharp flying metal particles)	78(22.0)	276(78.0)
Eye inching	63(17.8)	291(82.2)
Eye Red	81(22.9)	273(77.1)
Skin inching	47(13.3)	307(86.7)
Sore throat	55(15.5)	299(84.5)
Short breath	54(15.3)	300(84.7)
Cough	123(34.7)	231(65.3)
sleeping disorder	65(18.4)	289(81.6)
Red Skin	28(7.9)	326(92.1)

This study showed that the study subjects had good knowledge of occupational hazards associated with wood and metal work as 83.1% (294) responded the knowledge questions 75% and above correctly. Other studies from Ethiopia, Kenya and Hong Kong also report similar results. In an investigation for awareness of occupational hazards and associated factors among welders in Lideta Sub-City, Addis Ababa, Ethiopia it was also reported that 86.5% of respondents had knowledge on occupational hazards [5].

Similarly an OHS study in Ethiopia reported that careful working was considered to be very important by 93% of the respondents showing good degree of knowledge [7]. Another report from Kenya also states that 86.8% of workers had knowledge on the risks and mechanisms of work-related eye injuries [8].

There is clear gap between knowledge and practice in this study. An example for this can be some 71.2% of the respondents understood that wood work and metal work can cause harmful effect to health but only 42% respondents reported to use eyeglass always. The use of the other PPE was even less than that.

A study from Hong Kong also reported about 86.6% of the management team respondents and about 48.6% of the frontline construction workers responded that they did not use respirators [9] which are in line with findings in this work.

Similarly low rate of observed PPE use, 11.8%, was reported in the Kenyan study [8]. Among farm workers in Gaza stripes also, the highest use of PPE was reported to be 21.7% oral-nasal masks [10].

Different aspects related to PPE were also reported by other workers. For example, a Nigerian study reported that there is generally a good level of awareness of the hazard of noise to hearing, 93%, among steel rolling mill workers. In addition methods of prevention were stated by 92% of the respondents in the same study but only 27% possessed hearing protectors while only 28% of these reported using them all the time [11].

In another study in Ethiopia among Brewery workers it was reported that 86% of the workers utilized at least one type of PPE while at work [12]. This is markedly high and the rise could be associated with level of education, availability of PPE and enforcement of their use in the setting.

Cough which was found to be the highest prevalent complaint in this study was similarly the most prevalent complaint in the study conducted among Akaki textile factory workers [13]. Cough is associated with dust and therefore, wherever there is dust at the workplace it is expected to be highly prevalent.

Prevalence of Physical injuries in this study was 22%. Slightly higher rate of overall occupational injury prevalence in the previous one year 43.7% was reported among Addis Ababa city municipal solid waste collectors [14]. Another study from Southwest Ethiopia, reported prevalence of occupational injury 45.2% per year among Small Scale Industry Workers [15]. Similarly in another city in Northern Ethiopia (Meqelle) an annual occupational injury among Small Scale Industry Workers was reported to be 58.2% [16]. These higher values could be explained in knowledge attitude and practice differences, in socio-

demographic characteristics and working conditions among the different study groups.

5. CONCLUSION AND RECOMMENDATION

The overall knowledge, attitude and practice related to OHS of the Hawassa MSE wood and metal workers need to be raised. While the knowledge seems to be fairly high the attitude towards the use of PPE is low. This raises a serious public health concern given the fact that manufacturing is expanding in the area and the personnel joining the workforce are young people. Interventions including health education and training to improve the existing status of OHS and monitoring of the availability as well as use of PPE are highly recommended.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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