



Assessment of Usage of Personal Protective Equipment and Related Factors among Workers in Wood Workshops in Mutungo Parish, Nakawa Division, Kampala District

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ABSTRACT

Introduction: Workers across industries are exposed to a variety of hazards at the workplace. The use of PPE is an important strategy of preventing exposure to hazards that could result in injuries and illnesses among workers, including those in wood workshops. Despite the widely acknowledged benefits of PPE use, studies have shown that PPE use remains low, inconsistent and inappropriate.

Objective: This study sought to assess the extent and reasons for utilization of PPE among workers in wood workshops in Mutungo Parish, Kampala District.

Methods: The study used both qualitative and quantitative techniques in data collection. The sample size was 139 respondents in 11 wood workshops constituting of 5 in-depth interviews. Quantitative data was entered using epi-data 3.02 and then cleaned and univariate analysis done using STATA 13.0 while qualitative data was analyzed thematically.

Major findings: Despite all participants being aware of PPE, only 57.55% possessed at least one. 73.38% of respondents in the study had been victims of occupational hazards associated with wood workshop activities, the commonest injuries reported as cuts and hits. 62.5% of the workers had only one PPE, 35% had two and only 2.5% had at most three PPE while at work. The most possessed PPE was a dust mask, which was provided by the employer. In general, PPE utilization among the workers was found to be sub-optimal.

Study findings showed that reasons for failure to utilize PPE included; unavailability due to cost implications, interference of the PPE with speed of work and comfort issues.

Conclusion and recommendation: The study therefore recommends that quality and affordable PPE should be availed in the market and, safety and health awareness and education programs be extended to workers in the informal wood workshops so as to sensitize the workers on how they can ensure their own safety during work.

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ABBREVIATIONS

(ILO) International Labor Organization; (MoGLSD) Ministry of Gender, Labor and Social Development; (PPE) Personal Protective Equipment; (UBOS) Uganda Bureau of Statistics

Background

Africa as a continent was conjectured to fall short of meeting most of the Millennium Development Goals (MDGs), predominantly those related to health and occupational safety (WHO 2002). This was partly because African countries ignored the importance of Occupational Health and Safety (OHS) in achieving the MDGs [1]. Improving occupational health and

safety services remains one of the key interventions in achievement of improved health and safety outcomes for the populations in Africa [1].

Experiences from African countries such as Ethiopia indicate that policies or measures for delivering health and safety services to factory workers are limited [2]. This not only limits their access to information and training opportunities but also places the

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workers at a greater risk to occupational injuries and diseases. Furthermore, literature show that factory workers lack the knowledge on proper use of protective measures and are least aware of health effects emanating from the activities and materials in their work environments [2].

In Uganda, the constitution recognizes the importance of good working conditions of workers and their rights. Article 31 gives workers a right to healthy working environment while article 40(1) empowers parliament to enact laws to provide for the rights of persons to work under satisfactory, safe and healthy conditions (Government of Uganda, 1995). As a result, in 2005 a bill on occupational safety and health was brought to parliament ending into the enactment of occupational and health Act, No 9, 2006 with the overall purpose of safeguarding safety and health of all workers in all places on Uganda [3]. One of the main objectives of the Occupational Health Act is stressing measures and methods that should be put in place to ensure safety and health at work, within which use of PPE is inclusive.

The Ministry of Gender, Labor and Social Development (MGLSD) through the Department of Occupational Safety and Health, is responsible for administration and enforcement of the Occupational Safety and Health Act, No 9, 2006. This is through; registration of work places, inspection and monitoring of OSH activities at workplaces, education, training and creating awareness through dissemination of information on occupational safety and health among workers, employers and the general public [3].

The percentage of furniture establishments and employment in Uganda is 10% and 5% respectively [4]. The percentage of male and female employees in the furniture industry was 75% and 30% respectively [4]. In the registered gross output according to the 2010 report, the furniture industry contributed the least output of 2.2% and the value added to this sector was only 6% out of all other manufacturing industries [4]. Most of the carpentry workshops in Mutungo parish and Uganda are generally made of semi-permanent materials such as wood for partitions and iron sheets for a roof, with appalling working conditions. These structures are usually not registered with the department of Occupational Safety and Health under MGLSD therefore no information about them is available.

Methods

Study design and setting

A cross-sectional study design was used that employed mixed research methods. The study was conducted in Mutungo parish in Nakawa division, Kampala district. Nakawa is one of the main adminis-

trative divisions in Kampala with 23 parishes. Mutungo parish is one of the fast-developing parishes with many industrial works, among which are wood workshops, both mechanized and non-mechanized. The parish has a total population of 64,663 people, with 30000 males and 34663 females [5]. It contains three villages namely: Kiduuka, Kitintale and Mutungo Hill with 74 zones in total, 19 zones in Kiduuka, 37 zones in Kitintale and 18 zones in Mutungo Hill. There are 17,343 households [5].

The study was carried out among workers in wood workshops in villages found in Mutungo parish, Nakawa division.

Sample size and sampling procedure

Using the Leslie Kish (1965) formula using a 95% confidence interval (Z), a prevalence of usage of PPE of 10%, an acceptable error (δ) of 5% and a non-response rate of 10%, a final sample size of 139 was determined [6].

A multi-stage sampling strategy was used where; a mini-census was carried out of all wood workshops in Mutungo parish, per village, to know their number and identify those with protective equipment and those without. Thereafter employers and employees' perspective about PPE usage was obtained; in each village, the number of wood workshops that were included in the study was obtained through random sampling.

Data collection

Data was collected both quantitatively and qualitatively. Quantitative data was collected by filling an interviewer administered-closed ended questionnaire adapted from the Occupational Safety and Health Administration (OSHA) office of education and training [7], was used to collect information on background information, socio-demographic information, company details, safety programs, injury/incident reporting, safety performance and training, among others. Data was collected by trained research assistants through face-to-face interviews with the guidance of a questionnaire.

Data management and analysis

To ensure reliability, validity and quality of the research, the following measures will be taken; Pre-testing data collection instruments before the start of the study was done where one village in Mbuya parish, which met the criteria but not one of the study villages, was selected and 10 respondents interviewed. Research assistants were trained in the proper administration of the tools including research techniques such as probing, filling of research tools, communication and documentation. The questionnaire had a translated copy in a local language

(Luganda) for proper communication and to ensure that similar questions were asked every respondent, even in the local language. Employers and employees were interviewed using different questionnaires and an observational checklist used for purposes of triangulation. Quantitative data was entered using Epi-Data software. It was then cleaned and analyzed using STATA version 13 to derive descriptive findings. Qualitative data from observations was also analyzed descriptively.

Ethical considerations

Ethical issues were highly upheld to at all phases of the study. The permission for conducting this study was obtained from the school of Public Health, Makerere University. This study was conducted in a normal setting and the research questionnaires were coded to exclude the names of respondents hence protecting their identity. Consent of the respondents was sought and an assurance of confidentiality affirmed. Questions were explained to workers before the interview and they were given freedom to stop or withdraw from the interview at any time. All the questionnaires and the interview forms that were used in data collection were held in confidence.

Results

Socio-demographics of respondents

Table 1 shows the socio-demographic characteristics of the respondents. Majority (97.84%) of the respondents were male. Most (45.32%) of the workers in the wood workshops in Mutungo parish were between the age of 26-30 years, very few of them were above the age of 40 years. The highest level of education attained by most of the respondents was secondary level.

Table 1: The socio-demographic characteristic of workers in the wood workshops in Mutungo parish (n=139)

Age bracket in years	Frequency	Percentage
16-20	7	5.04
21-25	56	40.29
26-30	63	45.32
31-35	8	5.76
36-40	3	2.16
41-45	1	0.72
Over 45	1	0.72
Total	139	100
Gender		
Male	136	97.84

Female	3	2.16
Total	139	100
Marital Status		
Married	70	50.36
Divorced	2	1.44
Single	67	48.2
Total	139	100

Highest level of education

Primary	39	28.06
Secondary	86	61.87
Tertiary	1	0.72
University	4	2.88
No education	9	6.47
Total	139	100

In what terms are you employed in the workshop

Permanent	40	28.78
Temporary	98	70.5
Casual	1	0.72

Total		
Source: Survey data, 2019	139	100

Registration, disciplinary policy

Attributes such as; registration, disciplinary policy and induction programs, were assessed and the following were the results: Majority of the wood workshops (90.91%) that were visited were not registered with relevant authority. Almost all workers said that their workplace had policies regulating their conduct during work and while at the workshops. Majority (66.19) of the respondent in the wood workshops had been inducted at their workplaces before starting activities (Table 2).

Table 2. Registration status, disciplinary policy and induction programs in the wood workshops in Mutungo parish (n=139)

Is the company registered	Frequency	Percentage
Yes	1	9.09
No	10	90.91
Total	11	100
Does the company have a disciplinary policy?		
Yes	120	86.33
No	19	13.67
Total	139	100

Does the company have an induction program for employees?

Yes	92	66.19
No	47	33.81
Total	139	100
Source: Survey data, 2019	5.04	5.04

Level of knowledge on OHS and prevalence of injuries at the wood workshops

During the study, knowledge on hazards and prevalence of the occupational injuries were assessed among the workers.

Knowledge on hazards

Almost all (98.56) respondents in wood workshops in Mutungo parish knew the hazards associated with their employment activity. Most of them were well versed with injuries such as hitting their hands and cuts from the machinery they used (Table 3).

Table 3. Assessment of knowledge on occupational hazards, injuries and illnesses

	Frequency	Percentage
Do you know of any hazards (injuries and illnesses) associated with wood?		
Yes	137	98.56
No	2	1.44
Total	139	100
Which hazards do you know of?		
Injury (hits, cuts, etc.)	106	76.26
Falls	1	0.72
Muscular pain	25	17.99
Hearing impairment	2	1.44
Chest problems	5	3.6

Common hazards faced in the wood workshops and systems of reporting. Hazards faced

The most hazards that were suffered by workers in the wood workshops were; injuries (cuts and hits) (63.73%) followed by muscular pains (24.51%) and

then chest problems (7.84%). There were very few victims of hearing impairments (Figure 1).

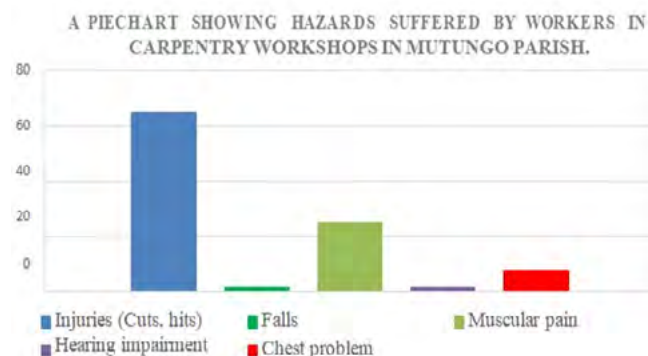


Figure 1. Shows occupational hazards faced by workers in wood workshops in Mutungo parish

Awareness, possession and source of PPE

Awareness of PPE: All the workers in wood workshops in Mutungo parish were aware of personal protective equipment.

Possession of PPE: More than half of the workers in the wood workshops that were visited in Mutungo parish had personal protective equipment (Table 4).

Table 4. PPE possession among workers in wood workshops visited (n=139)

Do you have PPE?	Frequency	Percentage	Yes
Yes	80	57.55	Yes
No	59	42.45	Yes
Total	139	100	

Type of PPE possessed Majority of the workers in the wood workshops had dust masks (66.25%). Very few of the workers were found with safety boots (18.75), overall (8.75) and safety goggles (6.25%) (Figure 2)

Among workers in the wood workshops that had personal protective equipment, majority of them had obtained it/them from their employers; very few had borrowed the PPE (Figure 3).

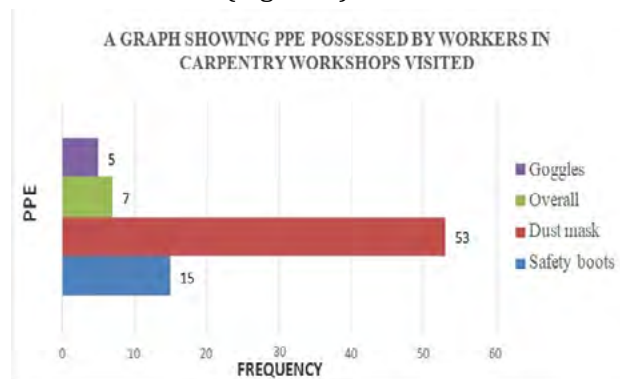


Figure 2. PPE possessed by workers in the wood workshops visited in Mutungo parish (n=80)

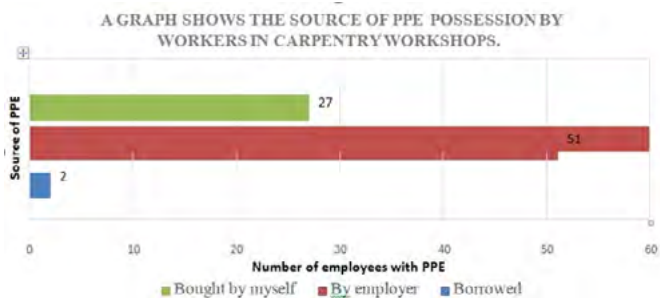


Figure 3. Source of PPE possessed by workers in the wood workshops in Mutungo parish (n=80)

Discussion

Socio-demographic characteristics of the sample population

Getting to understand the individual characteristics of the workers in the wood workshops such as age, gender, level of education, marital status and their terms of employment help put the study into context. Appreciating these characteristics was key to this study since they are factors that may influence workers’ decision on whether to utilize personal protective equipment or not while conducting their activities. The findings are therefore discussed as follows.

Workers in wood workshops in Mutungo parish were found to be predominantly male at 136(97.84%) while 3(2.16%) of the sample population were female. The small number of female respondents in the study population could be ascribed to the back-breaking nature of wood activities. Majority of workers in the wood workshops (45.32%) of the workers in the wood workshops in Mutungo parish were within the ages 26 and 30 years, followed by ages 21 and 25 years (40.29%), therefore, these could be considered youths. While very few (1.44%) of them were above the age of 40 years. The results indicate that very few persons in older age categories are working in the wood workshops. This could be explained by the laborious nature of work and because the aged employees mostly held managerial roles while others were the owners of the workshops. Presence of younger employees in the workshops could majorly be pivoted on school drop outs.

Majority of the respondents had attained some form of formal education. Those who had reached secondary school education were 86(61.87%) while those who had attained primary school education only were 39(28.06%). In addition, 4(2.88%) had gone up to university level, 1(0.72%) had attained tertiary education while 9(6.47%) had no formal schooling. The results indicated that work in the informal sector in this particular setting was not only a reserve for those with no formal teaching or with very low educational

achievement. Therefore, the results show that most of the workers were literate and could be trained on safety, work-related risk management and technical education in relation to PPEs in the wood workshop industry.

Characteristics of the wood workshops in Mutungo parish

Majority of the wood workshops (90.91%) did not have a registration license from the relevant authority. Since most of the wood workshops were not licensed, this could have affected utilization of PPE whereby the owners of these workshops would not consider fulfilling the necessary requirements for the kind of activities carried out in their workshops, as would be required of them by the relevant authority, such as availing protective equipment to their workers. Among the wood workshops studies in Mutungo Parish, about two thirds were of semi-permanent structure and only 1 was made of permanent structure. The semi-permanent structures were all made of timber. Temporary workshops were based at the homes of the owners with a small storage shelter however, most of the work done outside in the open. The nature of structures provides limited incentive to register the wood workshops formally and in turn hinder possession and utilization of PPEs.

The study indicated that almost all the wood workshops (86.33%) had policies regulating workers’ conduct while at work. This could be a platform for the management of the wood workshops to enforce compliance to utilization of the protective equipment by their employees. Two thirds of the respondents in the study reported being inducted at their places of work before starting workshop activities. This result is to some extent consistent with reporting by workshop owners that they carried out safety briefings to their employees. It however, contradicts the fact that all workers reported no formal training on safety at their workplace. This result shows that most probably the induction program for the new employees a particular way of carrying out carpentry activities within the workshops and less on OHS. This indicates a missed opportunity as through such induction programs the workers could be educated or trained in the area of PPE utilization and other matters of occupational safety.

Reasons for not possessing required protective equipment

The findings showed that none of the workers had the full complement of protective equipment required to protect them from occupational hazards that they may be exposed to while performing various wood work activities. Results showed that the reason for

non-possession of PPE were either personal or at organization level. For instance, one of the main reasons for not having the required PPE during duties was discomfort. Discomfort experienced while using PPE (as some workers involved in smoothening the timber noted that it was cumbersome doing so with gloves) made the workers not have them or use them inconsistently. This deviates markedly from the OSHA that requires all PPE to meet the ANSI standards [8]. Furthermore, the cost of the PPE was cited as a barrier to accessing them hence not having them. Some respondents highlighted the employer's inability to provide the PPE to them as reason for not having them, since some of their colleagues had been provided for with the PPE by the employer.

Among the workers in the wood workshops that had personal protective equipment, 2.5% of them had three, 35% possessed two and, majority only had one during working hours. The maximum number of PPE possessed during was only three. Compared to the hazards exposed to, this showed a very low level of PPE use. This result relates to the study that was done among small-scale industries in Jeddah on assessment of PPE use and occupational exposures, where PPE use was also very low in resonance with the hazards exposed to [9].

Majority of the workers in the wood workshops that suffered occupational hazards on job, did not have PPE at the time of the event. There is also possibility that some workers had the equipment but it was not appropriate. This could be explained by failure of the employers to comply to the OSHA Act (2007) part II 6 (1) that states that every employer shall ensure the safety, health and welfare at work of all employees (OSHA act).

Source of personal protective equipment

The study sought to find out where and how the workers who had PPE had gotten the protective equipment they used during work. Majority 51(63.75%), indicated that they were provided for by the employer, 27(33.75%) indicated that they bought the PPE themselves while 2(2.5%) of the respondents informed that they had borrowed. The result shows that majority of the workers obtained the protective equipment from their employers. This could be attributed to knowledge about the occupational hazards by the employers and consideration for safety of their employees. The study showed that majority of the workers had dust masks but very few of the workers were found with safety boots (18.75%), overalls (8.75%) and safety goggles (6.25%). This could be attributed to the cost of the protective equipment, the

dust masks being the cheapest of all therefore the employers probably found it easier to avail such to their employees.

Occupational safety and health training

The study also sought to establish whether the respondents had received any training on how they could protect themselves from work related hazards. The findings were that almost all workers, 138(99.28%) had not received any training on how they could protect themselves while only 1(0.72%) had received the training. The respondent who indicated that had received training said the training was done in the formal workplace where he had been employed prior to working in the informal sector.

Since majority of the workers had not had any formal or informal training on safe work systems, this may tend to make them vulnerable to occupational hazards and risks due to lack of knowledge about the relevance of mitigation measures such as utilization of protective equipment, to the potential workplace hazards despite the fact that almost all of the respondents (98.56%) had knowledge about the hazards that were associated with the kind of work they did.

Conclusion

This information is useful to the government and other interested stakeholders in the development of strategies for addressing occupational safety and health concerns arising from work places. The study concludes that demographic characteristics of workers, work climate, availability of PPE and occupational health and safety training play crucial roles in workers' decision-making process regarding utilization of personal protective equipment.

The study concludes that workers' utilization of PPE was suboptimal therefore leaving them more vulnerable to a variety of hazards, some of which could easily have been mitigated if there was utilization of ideal protective equipment. The study also concludes that training of workers in safety and health, which entails identification of hazards and mitigation measures, is key for improving the overall safety and health in workplaces.

Declarations

Ethics approval and consent to participate the study was approved by Makerere University School of Public Health. All participants provided written informed consent before their involvement in the study.

Consent for Publication

The authors declare that they have no conflict of interest.

Availability of Data and Material

The dataset used during the study is available on request.

Competing Interests

I declare that there are no competing interests to this study.

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