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Article in *Journal of Scientific Research and Reports* · January 2015

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# Awareness and Willingness to Utilize Health and Safety Measures among Woodworkers of a Timber Processing Firm in Ghana

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## Authors' contributions

This work was carried out in collaboration between all authors. Author SJM conceived of the study, participated in the design of the study and wrote the first draft of the manuscript. Author MD participated in the design of the study and sequence alignment. Author FB participated in the design of the study, performed the statistical analysis and participated in the sequence alignment. All authors read and approved the final manuscript.

## Article Information

DOI: 10.9734/JSRR/2015/15786

### Editor(s):

(1) Amit Balakrishnan, School of Pharmacy, University of Maryland, Baltimore, USA.

### Reviewers:

(1) Anonymous, India.

(2) Anonymous, Turkey.

(3) Keita Mamady, Central South University, China.

Complete Peer review History: <http://www.sciencedomain.org/review-history.php?iid=964&id=22&aid=8211>

Short Research Article

Received 18<sup>th</sup> December 2014  
Accepted 23<sup>rd</sup> January 2015  
Published 21<sup>st</sup> February 2015

## ABSTRACT

Reports from studies on occupational health and safety in the wood industry indicate that woodworkers are exposed to various types and degrees of hazards ranging from bacterial, viral and chemical infections to physical injury. In this study therefore, the awareness of occupational health and safety and willingness to use personal safety equipment by woodworkers were considered. A cross-sectional survey design was used for the study. Data for the broader study were collected from 300 respondents at a sawmill in Ghana using questionnaire which consisted of Likert-type items. The data were analyzed using descriptive statistics, ANOVA, and Scheffe's post hoc test at 0.05 level of significance where necessary. The result indicated that the respondents rated very high their awareness of occupational health and safety issues related to their work. The mean rating of the respondents' awareness of occupational health and safety issues ranged from 3.72 to 5.51 which were higher than the theoretical mean of 3.50. Additionally, educational

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background of the respondents appeared not to have significant influence on their ratings of awareness of occupational health and safety issues (20 out of the total number of 27 items did not show any significant difference). Furthermore, the respondents highly rated their willingness to use personal safety equipment at work and their rating was not significantly influenced by the departments they belonged to. Lastly, the result suggests that it is more likely for woodworkers to be willing to use personal protective equipment when they are aware of the safety and health implications on their occupation.

*Keywords: Awareness of safety practices; willingness to use personal safety equipment; wood processing; woodworkers.*

## 1. INTRODUCTION

The timber industry has been a major source of employment and income all over the world with Ghana not being an exception [1]. A survey conducted by [2] indicate that there exist a total of 105 registered sawmills in Ghana. These registered sawmills are made up of five large scale multinational companies, 25 medium scale and 75 small scale companies. It was further suggested by [2] that in addition to these registered companies are a number of unregistered sawmills dotted around the country. Wood companies in Ghana produce wood products ranging from lumber, veneer, plywood, mouldings and furniture parts. Currently in Ghana, the formal timber industry contributes about 6% to the gross domestic product and 11% to Ghana's export earnings [3]. It also creates about 100,000 jobs through direct employment in the legal timber industry and an estimated 130,000 jobs in chainsaw milling [4].

The above notwithstanding, historically, the wood industry has been considered to be one of the most dangerous for manufacturing employees [5]. The nature of the work done by workers in these occupations and the type of equipment and materials they handle present many on-the-job hazards and injuries [5,6]. Records at the Department of Factories Inspectorate in Ghana (1987 - 1998) indicate that about 50 percent of the fatal accidents in the industrial sector came from the wood working sector [7,8]. These hazards and injuries; Cut-type of injuries, fractures, sprains, catarrh, waist pains, eye problems and dizziness, [9] result from such incidents which include: Being caught-in or struck by machinery, falling from a height, heavy lifting, twisting and breathing in noxious or toxic chemicals and sawdust. In addition, woodworkers work under pressures for high productivity and are exposed to noise pollution that is injurious to human health [5]. Furthermore, a study conducted by [8] indicated that

employees in the wood processing industry in Ghana were exposed to physical, ergonomic, mechanical and chemical hazards. The perceived physical hazards in their study were sawdust, noise and extreme high temperature with sawdust being the major hazard in all the wood companies surveyed. This study further indicated that the existence of these hazards were due to the following: Inadequate Occupational Safety and Health (OSH) policy and procedures, low priority given to OSH issues by Timber and Woodworkers Union in Ghana, non-commitment by management to implement OSH policy where it existed and their consideration of payment of insurance premium as sufficient protection for workers. The restrictive inspections, education and enforcement carried out by under-resourced OSH enforcement agencies and non-existent of national OSH Policy give an impression of the government's lack of commitment toward workers' health and safety [8].

Estimate by [10] indicates that about 2.34 million people die from work-related accidents or diseases each year. A further 317 million suffer from work-related injuries. Occupational accidents may not only seriously affect the health of individual employees, but can also exact a high price on the overall economic health of wood product producers. Accidents are costly to an organization due to a variety of outcomes, including demotivation of workers, disruptions of activities, delayed progress of work, and additional adverse effects on the organization's overall cost structure, productivity, and reputation [11]. Thus, improved safety performance in wood processing industry should be a primary concern for both the labourers and managers at all levels. Improved safety performance could be achieved when workers at all levels have high levels of awareness and are prepared to practice safety in their work. However, no study has been conducted to specifically examine woodworkers' awareness and their preparedness to engage in safety practices. In this paper the authors seek to

assess the occupational health and safety practice of a timber processing firm in Ghana. Specifically, the study seeks to assess the awareness and willingness to adopt safety measures by the woodworkers of a selected sawmill in Ghana. Additionally, the study aims at determining the relationship between the awareness of occupational health and safety issues and workers willingness to use personal protective equipment.

## 2. RESEARCH QUESTIONS

This study on the assessment of occupational health and safety of a timber processing firm in Ghana is guided by the following research questions:

1. How do woodworkers rate their awareness of occupational health and safety?
2. How does educational level affect the rating of woodworkers on their awareness of occupational health and safety?
3. How do woodworkers rate their willingness to use personal safety equipments?
4. How does the department of woodworkers affect their rating of willingness to use personal safety equipment?
5. What is the relationship between woodworkers' awareness of occupational health and safety and willingness to use personal safety equipment?

## 3. RESEARCH METHODOLOGY

### 3.1 Research Design

A cross-sectional survey design was used for this study. According to [12] cross-sectional surveys are appropriate for situations where the data to be collected are about self-reported beliefs or behavior. Besides, it enables the researcher to collect data and compare many different variables at the same time without manipulating the study environment.

### 3.2 Population and Sample

The population for this study comprised 702 workers of a selected sawmill in the Ashanti region of Ghana. This includes: 372 workers at the sawmill department, 221 workers at the veneering department, 92 workers at the moulding department and 17 workers at the sawdoctoring department. Stratified random sampling technique was used to select

respondents from the various department of the selected company. The sample size was 426 and was determined in accordance with the mathematical formula:  $n = N / [1 + N (\alpha)^2]$  where  $n$  = sample size;  $N$  = sampling frame;  $\alpha$  = confidence level [8].

### 3.3 Instruments

The instrument for the study was a questionnaire which was adapted from safety management perception questionnaire prepared by [13]. The questionnaire was made up of five (5) parts. The first part dealt with the demographic data of the respondents namely: gender, length of service, level of education and department. The second part addressed issues on awareness of occupational health and safety by woodworkers of the selected company. This part was subdivided into five (5) sections which enabled respondents to rate their awareness of safety practices (dressing), machine safety, working environment, training and health. The other three parts of the questionnaire assessed: (1) The willingness of the workers to use safety practice equipment (2) The effect of wood processing on the health of woodworkers and (3) Conformity to safety practices by the workers of the wood processing company studied. A pilot study was conducted to assess the validity (internal consistency) and reliability of the questionnaire in order to enhance its accuracy for assessment and evaluation. Participants for the pilot study were selected from four departments namely: veneering, sawmilling, moulding and saw doctoring. They completed the sample questionnaire and in addition provided suggestions for its modification to help remove any ambiguity. The reliability of the questionnaire, which is concerned with its ability to measure consistently, was determined using the Cronbach's alpha. A Cronbach's alpha value of 0.78 which was obtained for the questionnaire used was considered adequate.

### 3.4 Data Collection Procedure

The data for the study was collected using a six and five-point likert scale questionnaires at a single point in time. The questionnaire was administered by the researchers to the participants directly in June 2014. A total number of about 426 questionnaires were distributed. The number of questionnaires successfully completed and returned were 300 (Sawmilling = 135; Veneering = 102; Moulding = 52;

Sawdoctoring = 11). This represents a return rate of about 70%. According to Dillman as cited in [14], a return rate of 70% is a representative sample of the population. Regarding educational level, seven of the respondents had informal education, 229 had primary education, 50 had secondary education and lastly, 14 had tertiary education. All ethical procedures required were followed. Participants were made to indicate their willingness to participate in the study. Directives on the questionnaires ensured respondents' anonymity and confidentiality.

### 3.5 Method of Data Analysis

The data was analysed using descriptive and inferential statistics. Correlation analysis was also performed to establish the associations between respondents' awareness and willingness to use personal safety equipment. Statistical software used for the analyses was Statistical Package for Social Scientists (SPSS). The mean and standard deviation of the ratings for each of the items were computed and the mean compared to the theoretical mean rating (assuming normal distribution of responses) to ascertain the respondents perception on the themes studied. Additionally, the effect of department and level of education on respondents' awareness of occupational health and safety issues, willingness to use personal safety equipment by the workers were determined. An item-by-item analysis of variance (ANOVA) at 5% level of significance was performed to establish possible significant difference in the respondents' ratings of the factors of this study. P-values lower than 0.05 were deemed significant. In such situations Scheffe's post hoc test was used to make pair wise comparison of the means.

## 4. RESULTS AND DISCUSSION

### 4.1 Woodworkers' Awareness of Occupational Health and Safety Practices

Occupational health and safety awareness is regarded as being aware of safety issues and the potential hazards to one-self and others in the workplace. The result in Table 1 indicates the mean ratings and the corresponding standard deviations of the indicators of the elements of awareness of occupational health and safety issues by respondents. Table 1 also presents the

resultant mean rating of all the indicators of awareness of occupational health and safety by the respondents (Item # 28). The theoretical mean rating for this part of the study which used a six-point likert scale was 3.50. The mean rating of the 300 respondents on their awareness of occupational health and safety practices ranged from 3.72 ( $SD = 0.909$ ) to 5.51 ( $SD = 0.941$ ). This result suggests that all the items had mean ratings exceeding the theoretical mean of 3.50. As indicated in Table 1, the item "Wood processing could lead to minor injury" (Item # 26) had the least mean rating of 3.72 ( $SD = 0.909$ ). Even though this item had the least mean rating, the value 3.72 exceeded the theoretical mean rating of 3.50. The value of 3.72 suggests that the respondents have the perception that wood processing sometimes could lead to minor injury. The highest mean rating of 5.51 ( $SD = 0.941$ ) related to the item "Electrical gargets should be put off before leaving the plant" (Item # 11). This also suggests that the respondents are aware that electrical gargets should always be put off before leaving the plant. The resultant mean rating of the awareness of safety by the respondents which is 4.91 ( $SD = 1.059$ ) compared to the theoretical mean of 3.50 suggests that the respondents were not ignorant of the need for occupational health and safety practice in the various aspects of their work. This result is consistent with that of [15].

In a study conducted at a Sawmill in Kumasi, [15] concluded that about 99.3% of the respondents were aware that the use of personal protective equipment at work can prevent or reduce the risk of getting involved in accidents. Contrary to the result of the present study is that obtained by [16]. In a study on the "Awareness of Occupational Hazards, Health Problems and Safety Measures among sawmill workers in North Central Nigeria", [16] indicated that the level of awareness of various occupational hazards among sawmill workers in North Central Nigeria was low. This may be due to the fact that in the present study most of the respondents (90.33%) are experienced woodworkers who had worked for over 5 years in the company studied. Therefore, they appear to be aware of existing or potential risks involved in their operations. Beside, various reasons like institutional training, adaptation of regulatory measures for safety precautions by management of the company might have contributed to their high awareness of occupational health and safety issues related to their work [17].

#### 4.2 Effect of Educational Background on Awareness of Occupational Health and Safety Issues

Table 2 seeks to compare the mean ratings of the awareness of occupational health and safety of the respondents based on their educational background. The item-by-item mean ratings for the respondents with informal, primary, secondary and tertiary education were all greater than the theoretical mean of 3.50. This result therefore suggests that the respondents were highly aware of the hazards and safety associated with their work irrespective of their educational background. The item-by-item one-way analysis of variance (ANOVA) to assess the influence of educational background on the respondents' ratings of their awareness of occupational health and safety issues (Tables 2) indicates that at 5% level of significance 20 out of the 27 items showed no significant effects of respondents educational background on their awareness of occupational health and safety issues of their work and working environment.

Nevertheless, for seven out of the 27 items the ANOVA result at 5% level of significance showed that educational background have significant effect on the ratings of the respondents on their awareness of occupational health and safety issues associated with their work. The seven items are: "Electrical gargets should be put off before leaving the plant", "woodworkers should adhere to machine safety rules", "wood processing plant needs adequate ventilation", "medical care scheme is needed for all workers", "wood processing could lead to skin irritation", "wood processing could lead to nausea" and "wood processing could lead to major injury".

#### 4.3 Willingness of Woodworkers to use Personal Protective Equipment

In this part of the study the mean ratings of each of the eight items indicating respondents' willingness to use personal protective equipment were computed and compared with the theoretical mean of 3.0 for the five-point likert scale. The mean ratings of the eight items as indicated in Table 3 shows that the ratings of the respondents' willingness to use personal protective equipment ranged from 2.09 ( $SD = 1.506$ ) to 4.84 ( $SD = 0.709$ ).

With the exception of the item "I am willing to use face shield during wood processing" (Item # 5) which had a mean rating 2.09 ( $SD = 1.506$ ), all the other items had mean ratings greater than

the theoretical mean of 3.0. The mean rating of 2.09 for the item "I am willing to use face shield during wood processing" suggests that most of the respondents were not willing or will rarely be willing to use face shield during wood processing. This result is consistent with a study conducted by [8] for which they concluded that most of the woodworkers in the firm studied were unwilling to use their face shield/goggle and nose mask. They rather place them on their forehead because according to them they find them uncomfortable to use. The mean ratings for the other items being greater than 3.0 suggest that the woodworkers used for the study will be willing to use gloves, overall, safety boot, goggles, nose and mouth mask, earplugs, and helmet during wood processing. This result is possibly due to the fact that the respondents were aware of the physical, ergonomic, mechanical and chemical hazards associated with their occupation and therefore are willing to take the necessary precautions to protect themselves and others against these hazards [8].

#### 4.4 Comparison of Ratings of Departments on Willingness to Use Personal Protective Equipment

The mean ratings of each of the four departments' (Veneering, Sawmilling, Moulding and Sawdoctoring) willingness to use personal protective equipment was computed (See Table 4) and compared with the theoretical mean of 3.0 for the five-point likert scale. The result shows that with the exception of Item # 5 (I am willing to use face shield during wood processing), the mean rating of the respondents were higher than the theoretical mean value of 3.0 for all the departments. This suggests that the workers in all the departments were willing to use personal protective equipments for their work.

Table 4 also presents the result of analysis of variance (ANOVA) to compare the mean ratings of the willingness of the woodworkers of the various departments to utilize personal protective equipment during wood processing. The result indicates that at 5% level of significance the mean ratings of the departments regarding their willingness to use personal protective equipment did not significantly differ ( $p$ -value  $> 0.05$ ). The exception to this was Item #5 which indicated significant difference in the rating of the departments on their willingness to use face shield during wood processing ( $p$ -value  $< 0.05$ ). The result of the pair-wise comparison of means

indicated that the mean rating of the willingness to use face shield by the workers of the sawdoctoring department ( $\bar{x} = 4.27$ ) was significantly higher than that of the other departments (Veneering = 1.77; Sawmilling = 2.13; Moulding = 2.15). What this means is that whilst the workers in the sawdoctoring department are highly willing to use face shield, those in the veneering, sawmilling and the moulding departments were not willing to use face shield even though they are exposed to fine airborne wood particles and dust which can cause irritation and nasal dryness [18]. Besides, they would also be exposed to other adverse health effects such as skin disorders (allergic

dermatitis), asthma, impaired lung function as well as a rare type of nasal cancer that has also been reported in people who have worked with hard woods in very dusty wood-working environments with little or no dust control in place [19]. This trend is partly due to the fact that the occupation of the workers at the sawdoctoring department exposes them to greater risk of eye injury. Their work which involves sharpening and side dressing of saws, welding, etc. exposes them to greater risk of eye injury. Additionally, education and enforcement of OHS regulations might have contributed to their willingness to use face shield.

**Table 1. Descriptive statistics of ratings on awareness of occupational health and safety issues**

Item #	Elements of awareness of health and safety practices	Mean rating (n= 300)	Standard deviation
<b>Dressing</b>			
1	Woodworkers need gloves /mittens	5.40	0.998
2	Woodworkers need overall	5.07	1.322
3	Woodworkers need safety boot	5.36	1.176
4	Woodworkers need goggles	5.22	1.245
5	Woodworkers need face shield	3.91	1.318
6	Woodworkers need nose and mouth mask	5.42	1.014
7	Woodworkers need earplugs or ear muffs	5.45	0.940
8	Woodworkers need helmet	5.06	1.052
<b>Machines</b>			
9	Machine guards and fence need to be in place	5.13	1.288
10	Only trained personnel need to operate the machines	5.27	1.271
11	Electrical gargets should be put off before leaving the plant	5.51	0.941
12	Woodworkers should adhere to machine safety rules	5.28	1.169
<b>Working environment (pollutant)</b>			
13	Wood processing plant needs adequate ventilation	5.39	0.931
14	Noise at wood processing plant need to be within acceptable level	5.26	1.071
15	Wood processing plants needs adequate dust harvesters	5.44	0.806
16	Adequate lighting is needed at wood working place	5.42	0.844
17	Excessive heat in working place should be avoided	5.32	1.074
<b>Training</b>			
18	On-the-job training is needed for all new employees	5.18	1.182
19	Woodworkers need to attend safety workshops	5.19	1.075
<b>Health</b>			
20	Medical care scheme is needed for all workers	5.14	1.143
21	Wood processing could lead to skin irritation	4.44	0.961
22	Wood processing could lead to nausea	4.42	0.980
23	Wood processing could lead to lack of appetite	3.81	1.002
24	Wood processing could lead to headaches	4.05	0.748
25	Wood processing could lead to hearing loss	3.83	0.869
26	Wood processing could lead to minor injury	3.72	0.909
27	Wood processing could lead to major injury	4.00	0.963
28	Resultant mean for awareness of health and safety practices	4.91	1.059

**Table 2. ANOVA on awareness of woodworkers on occupational health and safety practice**

Item #	Elements of awareness of occupational health and safety practice	Informal education (n <sub>1</sub> = 7)		Primary education (n <sub>2</sub> = 229)		Secondary education (n <sub>3</sub> = 50)		Tertiary education (n <sub>4</sub> = 14)		F-value	p-value
		Mean	SD	Mean	SD	Mean	SD	Mean	SD		
<b>Dressing</b>											
1	Woodworkers need gloves/mittens	4.71	1.38	5.43	1.00	5.40	.95	5.29	.99	1.23	.301 <sup>†</sup>
2	Woodworkers need overall	4.14	1.21	5.11	1.29	5.02	1.48	5.07	1.27	1.26	.289 <sup>†</sup>
3	Woodworkers need safety boot	4.86	1.57	5.43	1.13	5.22	1.30	5.07	1.27	1.20	.310 <sup>†</sup>
4	Woodworkers need goggles	4.86	.90	5.27	1.21	5.08	1.48	5.14	1.03	.53	.662 <sup>†</sup>
5	Woodworkers need face shield	3.29	.76	3.84	1.29	4.12	1.41	4.64	1.45	2.63	.050 <sup>*</sup>
6	Woodworkers need nose and mouth mask	5.14	1.21	5.41	1.02	5.58	.91	5.14	1.23	.939	.422 <sup>†</sup>
7	Woodworkers need earplugs or ear muffs	5.14	1.21	5.47	.92	5.50	.95	5.21	1.12	1.21	.608 <sup>†</sup>
8	Woodworkers need helmet	4.71	.95	5.11	1.05	4.84	1.09	5.14	1.03	.611	.306 <sup>†</sup>
<b>Machines</b>											
9	Machine guards and fence need to be in place	4.57	1.62	5.17	1.25	5.10	1.30	4.86	1.66	.73	.535 <sup>†</sup>
10	Only trained personnel need to operate the machine	4.57	1.81	5.31	1.23	5.32	1.24	4.84	1.56	1.29	.279 <sup>†</sup>
11	Electrical gargets should be put off before leaving the plant	4.57	1.90	5.54	.90	5.56	.86	5.29	1.07	2.74	.044 <sup>*</sup>
12	Woodworkers should adhere to machine safety rules	4.14	1.77	5.32	1.12	5.34	1.17	5.00	1.47	2.66	.048 <sup>*</sup>
<b>Working environment (pollutant)</b>											
13	Wood processing plants need adequate ventilation	4.43	1.51	5.42	.87	5.42	.99	5.21	1.12	1.82	.039 <sup>*</sup>
14	Noise at wood processing plants need to be within acceptable level	4.71	1.38	5.27	1.07	5.34	.92	5.07	1.38	.84	.471 <sup>†</sup>
15	Wood processing plants need adequate dust harvesters	4.83	.86	5.45	.80	5.54	.76	5.36	.93	1.50	.205 <sup>†</sup>
16	Adequate lighting is needed at work place	4.86	.90	5.44	.83	5.50	.81	5.21	1.12	1.54	.215 <sup>†</sup>
17	Excessive heat in work place should be avoided	4.71	1.70	5.34	1.01	5.34	1.17	5.07	1.38	1.04	.376 <sup>†</sup>
<b>Training</b>											
18	On-the-job training is needed for all new employees	4.71	1.25	5.20	1.14	5.20	1.29	5.00	1.47	.54	.692 <sup>†</sup>
19	Woodworkers need to attend safety workshops	4.61	.95	5.21	1.07	5.18	1.04	5.07	1.38	.49	.657 <sup>†</sup>
<b>Health</b>											
20	Medical care scheme is needed for all workers	3.86	1.86	5.18	1.08	5.12	1.22	5.21	1.12	3.14	.026 <sup>*</sup>
21	Wood processing could lead to skin irritation	4.57	1.40	4.54	.92	4.10	.99	4.07	.92	3.69	.012 <sup>*</sup>



Item #	Elements of awareness of occupational health and safety practice	Informal education (n <sub>1</sub> = 7)		Primary education (n <sub>2</sub> = 229)		Secondary education (n <sub>3</sub> = 50)		Tertiary education (n <sub>4</sub> = 14)		F-value	p-value
		Mean	SD	Mean	SD	Mean	SD	Mean	SD		
22	Wood processing could lead to nausea	4.29	1.80	4.51	.93	4.22	1.06	3.86	.77	2.93	.034*
23	Wood processing could lead to lack of appetite	4.29	1.80	3.85	.98	3.70	.95	3.36	.93	1.80	.147 <sup>†</sup>
24	Wood processing could lead to headaches	3.71	1.38	4.09	.72	4.02	.74	3.71	.73	1.69	.170 <sup>†</sup>
25	Wood processing could lead to hearing loss	4.00	1.63	3.84	.84	3.90	.81	3.36	.93	1.61	.188 <sup>†</sup>
26	Wood processing could lead to minor injury	4.14	1.68	3.71	.90	3.58	.78	3.36	.93	1.40	.244 <sup>†</sup>
27	Wood processing could lead to major injury	4.43	1.62	4.01	.96	4.06	.79	3.36	.93	2.66	.049*

*Statistically significant at 0.05 level of significance; <sup>†</sup>Not statistically significant at 0.05 level of significance*

**Table 3. Descriptive statistics on rating of willingness to use personal protective equipment**

Item #	Elements of willingness to use personal safety equipment	Mean rating (n = 300)	Standard deviation
1	I am willing to use gloves/mittens during wood processing	4.78	0.800
2	I am willing to use overall during wood processing	4.61	0.981
3	I am willing to use safety boot during wood processing	4.83	0.741
4	I am willing to use goggles during wood processing	4.75	0.901
5	I am willing to use face shield during wood processing	2.09	1.506
6	I am willing to use nose and mouth mask during wood processing	4.84	0.709
7	I am willing to use earplugs during wood processing	4.82	0.753
8	I am willing to use helmet during wood processing	3.74	1.274
9	Resultant mean for elements of willingness to use personal safety equipment	4.31	0.995

**Table 4. ANOVA for the rating of departments on the willingness to use personal safety equipment**

Item #	Elements of willingness to use personal safety equipment	Veneering (n = 102)		Sawmilling (n = 135)		Moulding (n = 52)		Sawdoctoring (n = 11)		F-value	p-value
		Mean	SD	Mean	SD	Mean	SD	Mean	SD		
1	I am willing to use gloves/mittens during wood processing	4.76	.72	4.78	.87	4.85	.78	4.64	.81	.247	.863 <sup>†</sup>
2	I am willing to use overall during wood processing	4.52	1.04	4.67	.95	4.69	.92	4.18	.98	1.305	.273 <sup>†</sup>
3	I am willing to use safety boot during wood processing	4.91	.49	4.82	.83	4.77	.85	4.45	.93	1.483	.219 <sup>†</sup>
4	I am willing to use goggles during wood processing	4.75	.81	4.78	.90	4.65	1.10	4.73	.65	.240	.868 <sup>†</sup>
5	I am willing to use face shield during wood processing	1.77	1.27	2.13	1.54	2.15	1.55	4.27	1.01	10.088	.000 <sup>*</sup>
6	I am willing to use nose and mouth mask during wood processing	4.93	.35	4.79	.86	4.85	.78	4.55	.82	1.406	.241 <sup>†</sup>
7	I am willing to use earplugs during wood processing	4.90	.41	4.78	.90	4.85	.78	4.55	1.04	1.993	.370 <sup>†</sup>
8	I am willing to use helmet during wood processing	3.65	1.19	3.88	1.28	3.73	1.25	3.00	1.79	1.051	.115 <sup>†</sup>

*Statistically significant at 0.05 level of significance; <sup>†</sup>Not statistically significant at 0.05 level of significance*

#### 4.5 Relationship between Woodworkers' Awareness of Occupational Health and Safety Issues and Willingness to Use Personal Safety Equipment

Correlation analysis to establish relationship between woodworkers' awareness of occupational health and safety and willingness to use personal safety equipment indicates that at 5% level of significance there exists a strong significant positive correlation between woodworkers' awareness and willingness to use: Overall, goggles, face shield and helmet ( $R_{\text{overall}} = 0.193$ ,  $p\text{-value} = 0.001$ ,  $N = 300$ ;  $R_{\text{goggles}} = 0.241$ ,  $p\text{-value} = 0.000$ ,  $N = 300$ ,  $R_{\text{face shield}} = 0.384$ ,  $p\text{-value} = 0.000$ ,  $N = 300$ ,  $R_{\text{helmet}} = 0.336$ ,  $p\text{-value} = 0.000$ ,  $N = 300$ ). This result suggests that the willingness of the woodworkers to use overall, goggles, face shield and helmet is largely influenced by their awareness of the need to use them in order to protect themselves during wood processing. On the contrary, there was no significant correlation between woodworkers' awareness and willingness to use: gloves/mittens, safety boot, nose and mouth mask, and earplugs ( $R_{\text{gloves}} = 0.094$ ,  $p\text{-value} = 0.105$ ,  $N = 300$ ;  $R_{\text{safety boot}} = 0.029$ ,  $p\text{-value} = 0.618$ ,  $N = 300$ ,  $R_{\text{nose \& mouth mask}} = -0.050$ ,  $p\text{-value} = 0.391$ ,  $N = 300$ ,  $R_{\text{earplug}} = 0.000$ ,  $p\text{-value} = 0.998$ ,  $N = 300$ ).

#### 5. CONCLUSION AND RECOMMENDATIONS

Occupational health and safety is one of the issues which if neglected could significantly affect the operational efficiencies of sawmills. An injury and health related problems associated with wood processing could seriously affect the socio-economic condition of the worker, his dependants and the company. The result of this study suggests that the respondents were not ignorant of the need for safety practice in the various aspects of their work. Additionally, the educational background of the respondents did not significantly influence their awareness of occupational health and safety issues relating to their work. Furthermore, the respondents generally indicated highly their willingness to use personal safety equipment with the exception of that for the use of face shield during wood processing. Finally, the rating of the respondents' on their willingness to use personal safety equipment was not significantly influenced by departments for which they belong to. It is therefore suggested that further studies should

be conducted to assess the relationship between the willingness and the actual usage of personal safety equipment in the firm studied.

#### ACKNOWLEDGEMENTS

The authors are grateful to the management of the sawmill used for the study. Our appreciation also goes to the workers for willingly accepting to be part of this study. Special thanks also go to Mr. Francis Donkor of the Department of Mechanical Technology Education, University of Education for his professional advice during the preparation of the instrument for the study.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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