

KNOWLEDGE, ATTITUDE AND COMPLIANCE TO OCCUPATIONAL HEALTH AND SAFETY PRACTICES AMONG VEHICLE ARTISANS

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Abstract. Occupational health hazards pose a significant public health problem that has severe social and economic implications. Occupational health and safety is the science of predicting, identifying, evaluating and managing the hazards occurring in or from the workstation that could affect the safety and well-being of employees, taking into account the possible effects on the surrounding neighbourhoods and the general environment. Vehicle artisans, also known as mechanics, apply chemicals that may be hazardous to carry out vehicle repairs. Chemical spraying is the most efficient way of applying solvents, penetrating lubricants, and cleaners that are often uniquely shaped or hard-to-access areas of a vehicle. A cross-sectional study was conducted among artisans from May 1 to September 30, 2020. Data from 233 respondents utilizing both quantitative and qualitative approaches were obtained. Study participants were randomly selected employing a stratified random sampling technique from 3 units of welders, sprayers and mechanics. Data was analyzed into descriptive and inferential statistics at $p < 0.05$ using STATA vs 14.0 software. All the artisans sampled were male with a mean age of 32.28. Persons between the age brackets of 18-37 years constituted the majority. More than half (59.23%) of the artisans had junior high school education. Lack of training (80.26%) and discomfort in wearing PPE was associated with poor application of safety procedures. The study also revealed that more than half of the employees (59.66%) sought medical treatment from a health physician. The study, therefore, concludes that although vehicle artisans have good health-seeking behaviour, hazards and accident prevention requires training and adherence to safety application at all levels.

Keywords: *knowledge level, attitude, occupational health, safety practices, artisans, swame magazine*

Introduction

Occupational Health and Safety (OHS) is an interdisciplinary and cross-sectoral field that is concerned with the safety, health, and well-being of people involved in the job. OSH according to Jafarian et al. (2019) is the science of predicting, identifying, evaluating and managing the hazards occurring in or from the workstation that could affect the safety and well-being of employees, taking into account the possible effects on the surrounding neighbourhoods and the general environment (Jafarian et al., 2019).

International Labour Organization (ILO) and the World Health Organization (WHO), both have a description of occupational health, generally understood as: “the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations”(Jafarian et al., 2019). Occupationally-related accidents and illnesses have a crucial effect on individuals and families, not only in monetary terms but their physical and emotional well-being. The crucial effects also affect productivity, obstructing competitiveness and reputation of enterprises along supply chains, and impacting the economy and society more widely (ILO, 2019). When a healthy workplace is generated, workers will be more driven, more committed, and more engaged (Akple et al., 2013). This is because various determinants of workers' health are increasingly valued, including environmental, cultural, and social influences, as well as public lifestyle (WHO, 2010). Globally, dialogue among professionals regarding a healthy work environment indicates a connective capacity for interaction between the workstation and the community (Portmann and Giusti, 2007).

A healthy work environment and safety culture include all values, attitudes, rules, management systems and practices, collaborative principles and working behaviour adequate for contributing to a secure and stable work atmosphere-an environment where people can perform with high quality and productivity (ILO, 2019). Occupationally-related stress is an increasing cause of ill health in many countries and various types of workplaces (ILO, 2014). While worker's health is crucial to sustainable output in any organization, productivity is equally influenced by the working environment created (WHO, 2010). Decreasing the risk of injuries and disease at work contributes to social sustainability and protection programs (ILO, 2014). Employees' health and safety, skills, and labour participation are major factors in the socioeconomic growth and sustainability of each nation (Rantanen et al., 2020). Occupational health statistics indicate that 40%-50% of the world's workforce is exposed to hazardous working conditions. According to the International Labour Organization (ILO), approximately 2.3 million women and men die annually from work-related injuries or diseases. Estimates from ILO indicate that 160 million cases of harm from occupational diseases strike yearly. Hence, 6,300 people die daily from work-related accidents while 860,000 persons are injured (Marahatta et al., 2018). Recent reports from ILO indicate that the worldwide incidence rate of fatal occupational injury is 71 per 100,000 workers per year. Similarly, 30%-50% of workers in developed regions are prone to psychological stress (Oluoch et al., 2017).

Environmental stressors (ES) and occupational stress have been closely linked to occupational diseases. Yet, proper accessibility to adequate occupational health care services in the less industrialized world is between, 5%-10% as opposed to 20%-50% in the industrialized world (Oluoch et al., 2017). For employees to uphold safe workplace culture, recognition of potential hazards while discharging various duties is crucial. This will help mitigate potential outcomes that may arise in the course of work performance. Industrial workers such as vehicle artisans are exposed to potential risks and hazards that can be alleviated through the proper implementation of occupational health and safety practices. Appropriate integration of safety measures and personal protective equipment among workforces can lessen exposure to workplace hazards. This study, therefore, seeks to examine the Knowledge Level, Attitude and Compliance with Occupational Health and Safety practices among vehicle artisans at Suame Magazine, Kumasi Ghana.

2014).

Materials and Methods

This study was cross-sectional by design and analytical by type and utilized both quantitative and qualitative approaches. The study was conducted at the Suame Magazine, Kumasi Metropolis. Moreover, the study looked at artisans at Suame Magazine in the Ashanti region. For this study, three units (Welders, Sprayers, and Auto Mechanics) in zone 18 were covered. Similarly, the study entailed a population of approximately 450 artisans. Welders and sprayers accounted for 100 individuals and auto mechanics accounted for 250 artisans. In addition, the heads of these units were also interviewed to generate qualitative data. A sample size of 233 artisans aged 18 years old and above was randomly selected and was calculated using the Yamane formula (Puszczak et al., 2013; Neilson, 2011) Eq. (1).

$$n = \frac{N}{[1 + N(e)^2]} \quad \text{Eq. (1)}$$

Where, n=the sample size; N=the population size; and e=the allowable margin of error which is 5% at a 95% confidence level is ± 1.96 . The computed sample size is 212.

$$n = \frac{450}{[1 + 450(0.05)^2]} = 212$$

Calculating a 10% sample size of non-response rate= $0.1(212)=21$. Therefore, the estimated sample size of two hundred and thirty-three (233) participants was recruited into the study. The sampling distribution in the strata of welders was estimated as: $=100/450=0.22 \times 233=51$. For sprayers: $100/450=0.22 \times 233=51$. For mechanics: $250/450=0.56 \times 233=131$. Data collection was done using stratified random sampling of artisans who report to duty on working days in strata of welders, sprayers and mechanics. The main tools for collecting data from the artisans were achieved through the utilization of a semi-structured questionnaire for quantitative data and an in-depth interview using an interview guide, a notepad, and a recorder for qualitative data. Quantitative data collected was inputted and cleaned using Microsoft Excel and analyzed using STATA version 14.0. For this study, both descriptive and inferential analysis was done on a 95% confidence level. The qualitative data collected, were first transcribed and analyzed in themes (thematic analysis) using the researcher as the primary tool for just analysis.

Results and Discussion

The findings of this study were presented in two different captions; the first part entails the socio-demographic characteristics of artisans, followed by Knowledge Level, Attitude and Compliance with Occupational Health and Safety practices.

Sociodemographic characteristic

Table 1 shows the socio-demographic characteristics of the respondents. A total of 233 artisans working at Suame Magazine zone 18 participated in this study. The study identified three categories of vehicle artisans, namely, sprayers, welders and mechanics who performed different tasks within the same zone. The distribution of study

participants by occupation includes fifty-one sprayers (21.89%), fifty-one welders (21.89%) and one hundred and thirty-one mechanics (56.22%). Considering age category, ninety-two of the respondents (39.48%) were in the age bracket of 18-27 years, fifty-eight (24.89%) were between the ages of 28-37 years, fifty-three (22.75%) were within the age category of 38-47 years, twenty-five (10.73%) fell between the age group of 48-57 years, while five (2.15%) were 58 and above. The mean age of respondents ($SD=\pm 11.31$) was 33.28. Data on demographic characteristics about gender indicates that all of the respondents were male.

Table 1. Sociodemographic characteristics.

Variable	Frequency (N=233)	Percentage (%)	Mean	SD
Occupation				
Sprayers	51	21.89		
Welders	51	21.89	-	-
Mechanics	13	56.22		
Age of respondents (yrs)				
18-27	92	39.48		
28-37	58	24.89	33.28	11.31
38-47	53	22.75		
48-57	25	10.73		
>58	5	2.15		
Gender of respondent				
Female	0	0	-	-
Male	233	100		
Marital status				
Married	110	47.21		
Single	92	39.48	-	-
Co-habitation	28	12.02		
Widow/widower	3	1.29		
Educational qualification				
Non-formal education	14	6.01		
Primary school education	21	9.01		
Junior high school	138	59.23	-	-
Senior high school	55	23.61		
Tertiary education	5	2.15		
Years of working experience (yrs)				
1-7	103	44.21		
8-15	53	22.75		
16-23	51	21.89	12.14	9.10
24-31	15	6.44		
>32	11	4.72		

Regarding the marital status of the 233 respondents in this study, one hundred and ten (47.21%) were married, ninety-two (39.48%) were single, twenty-eight (12.02%) were cohabitating, and only three (1.29%) were widowers. Judging by the educational qualification, fourteen (6.01%) had no formal education, twenty-one (9.01%) had attained primary school education, one hundred and thirty-eight (59.23%) had junior high school, fifty-five (23.61%) had up to senior high school education, while only five (2.15%) had tertiary education. The number of years of working experience by each artisan was equally evaluated and one hundred and three (44.21%) fell in the category of 1-7 years, fifty-three (22.75%) had 8-15 years of working experience, fifty-one respondents (21.89%) had worked for 16-23 years, fifteen (6.44%) had the 24-31 years work experience, while eleven respondents (4.72%) had worked for 32 years and above. The mean years of working experience ($SD=\pm 9.10$) was 12.14.

According to the socio-demographic characteristics, the artisans were predominately males. Study participants were relatively young, with a mean age of 32.28 found in the age brackets 18-27 and 28-37 years. These age groups represent the majority in the study. This is similar to the findings of Amfo-Otu and Agyemang (2016) in a study

conducted in the Sekyere East District of Ghana. The results showed that young people between the ages of 17-35 accounted for the majority (84.3%) of persons working in the Informal Sector as Auto Mechanics. Additionally, the preponderance of the male gender being involved in risky and hazardous work in tandem with the study conducted in Ethiopia on occupational risk and hazard exposure by Amabye (2016) who reported that males accounted for 97.8% of persons working in high-risk environments in the informal sector. Research in Australia by Morrell et al. (1998) also revealed that 78% of persons involved in hazardous work were males; all in the informal sector. This could be ascribed to the high level of physical labour required since the nature of the work involves lifting heavy loads, lying under the car, and using sharp objects and heavy tools. It could perhaps be viewed culturally as men's responsibility. The majority of the interviewees were married. The proportion of respondents with junior high school education was high (59.23%) which is contrary to the finding (Amfo-Otu and Agyemang, 2016) where the majority of the respondents had basic primary education (85.7%). It however affirms that many artisans have got some form of formal education. Most of the workers had working experience between 1-7 years with the mean years of (SD= ± 9.9969) 12.14. The outlier in the mean was caused by the number of respondents who worked between the years 1-7.

Safety practices

Table 2 presents the views, "Yes" or "No" of artisans and shows the frequency and percentages in response to safety equipment available at the workshop. Forty-eight artisans (20.6% of total respondents) indicated the availability of fire extinguishers at the workplace, while one hundred and eighty-five (79.4%) indicated no availability of fire extinguishers. Forty-one (17.6%) respondents affirmed the availability of a first aid box at the workplace while a greater number of respondents (one hundred and ninety-two or 82.4%) said "no" to the availability of a first aid box. One hundred and six participants (45.49%) affirmed the availability of rest room for leisure during break periods while one hundred and twenty-seven (54.51%) said there was no restroom for workers at the workplace. However, twenty-one (9.01%) of the overall respondents said they always rest inside the car during break periods. Only seventeen (7.3% of total respondents) affirmed the availability of showers for workers while two hundred and sixteen (92.7% of total respondents) said there was no showering facility for employees to wash down after exposure to workplace hazards, debris and particles.

Table 2. *Safety practices.*

Variables	Frequency (N=233)	Percentage (%)
Safety equipment available at workplace		
Fire extinguisher		
No	185	79.4
Yes	48	20.6
Safety equipment available at workplace		
First aid box		
No	192	82.4
Yes	41	17.6
Safety equipment available at workplace		
Rest room		
No	127	54.51
Yes	106	45.49
Safety equipment available at workplace		
Shower		
No	216	92.7
Yes	17	7.3

Safety equipment available at workplace		
Car rest		
No	212	90.99
Yes	21	9.01
Safety equipment available at workplace		
Familiarity with the 2007 OSHA		
No	11	4.72
Yes	208	89.27
Somewhat	14	6.01
Health complaints leading to absenteeism		
Cut		
No	121	51.93
Yes	112	48.07
Health complaints leading to absenteeism		
Abrasions		
No	217	93.13
Yes	16	6.87
Health complaints leading to absenteeism		
Burns		
No	168	72.1
Yes	65	27.9
Health complaints leading to absenteeism		
Falls		
No	186	79.83
Yes	47	20.17
Health complaints leading to absenteeism		
Chest pain		
No	179	76.82
Yes	54	23.18
Health complaints leading to absenteeism		
Back pain		
No	127	54.51
Yes	106	45.49
Health complaints leading to absenteeism		
Eye problems		
No	163	69.96
Yes	70	30.04
Causes of poor application of safety procedure		
Lack of training		
No	46	19.74
Yes	187	80.26
Causes of poor application of safety procedure		
Lack of commitment		
No	160	68.67
Yes	73	31.33
Causes of poor application of safety procedure		
Poor work culture		
No	160	68.67
Yes	73	31.33
Causes of poor application of safety procedure		
Inadequate resources and facility		
No	165	70.82
Yes	68	29.18
Causes of poor application of safety procedure		
Lack of motivation among workers		
No	187	80.26
Yes	46	19.74
Causes of poor application of safety procedure		
Inadequate staff		
No	194	83.26
Yes	39	16.74
Presence of safety committee		
No	211	90.56
Yes	22	9.44
Challenges in implementing OSHA regulation		
Lack of training		
No	69	29.61
Yes	164	70.39
Challenges in implementing OSHA regulation		
Lack of finance		
No	183	78.54
Yes	50	21.46
Challenges in implementing OSHA regulation		

Inadequate facilities		
No	141	60.52
Yes	92	39.48
Challenges in implementing OSHA regulation		
Worker motivation		
No	184	78.97
Yes	49	21.03
Challenges in implementing OSHA regulation		
Lack of enforcement		
No	159	68.24
Yes	74	31.76
Formal system of reporting accident and injury		
Yes	8	3.43
No	225	96.57
Don't know	0	0
Undergo training on OSHA		
Yes	20	8.58
No	213	91.42
Don't know	0	0
Somewhat	0	0
Register for accident and injury recording		
Yes	4	1.72
No	223	95.71
Don't know	5	2.15
Somewhat	1	0.43

Concerning worker's familiarity with the 2007 Occupational Health and Safety Act (OSHA), only eleven (4.72%) of the total respondents admitted being familiar with the 2007 OSHA and two hundred and eight (89.27%) as the majority said they were not familiar with the 2007 OSHA, while fourteen (6.01%) indicated that they were somewhat familiar with the 2007 OSHA. Regarding the health complaints of workers leading to work absenteeism in a multiple choice response, one hundred and twelve (48.07% of total respondents) which is less than half admitted cut to have led to work absenteeism. Only sixteen (6.87%) of the study participants said abrasions led to work absenteeism. Sixty-five participants (27.9%) said burns contribute to work absenteeism; forty-seven (20.17%) indicated falls to have caused absenteeism from work; fifty-four (23.18%) agreed that chest pain causes work absenteeism, while one hundred and six (45.49%) said back pain injury results to workers absenteeism. Only seventy respondents (30.04%) said absenteeism from work was caused by eye problems. Other health complaints associated with work absenteeism mentioned by the respondents included car accidents, fumes, stress, malaria (from mosquito bites), diarrhoea and being hit by objects.

Concerning the frequency of following safe work procedures, *Figure 1* shows that seventy participants (30.04%) stated that they always followed safe work procedures. Fifty-five respondents (23.61%) often follow safe work procedures, while sixty-four (27.47%) sometimes follow safe work procedures. Thirty-nine respondents (16.74%) rarely follow safe work procedures, while only five (2.15%) never complied with safe work procedures. Furthermore, *Table 2* presents the causes of poor application of safety procedures during work were identified following a multiple-choice response. Lack of training was affirmed by one hundred and eighty-six (80.26%) respondents. Lack of commitment was admitted by seventy-three (31.33%) respondents, while poor work culture was selected by seventy-three respondents (31.33%). Sixty-eight respondents (29.18%) thought that inadequate resources and facilities contributed to poor application of safety practices; forty-six (19.74% of total respondents) attributed poor application of safety procedures to lack motivation among workers, while thirty-nine (16.74%) of the total respondents believed that inadequate staff causes poor application of safety

procedures. Other participants attributed poor application of safety procedures to ignorance, discomfort with wearing protective gear and lack of finances. Regarding the existence of a safety committee at the workplace, two hundred and eleven respondents (90.56%) said they did not have a safety committee to oversee the proper implementation of safety procedures while only twenty-two (9.44% of total respondents) said they had a functional safety committee

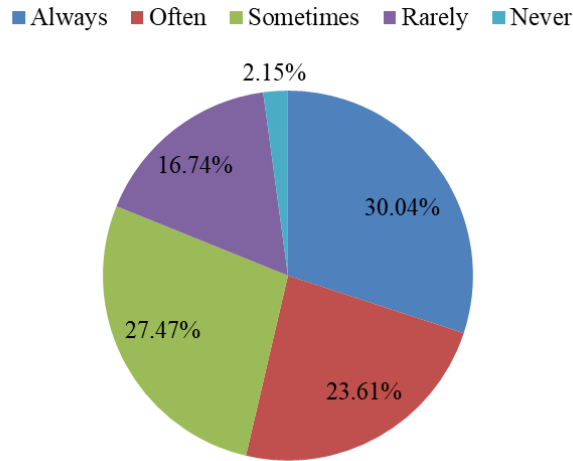


Figure 1. Frequency of following safe work procedure.

As shown in *Table 2* below, this section looked at the challenges in implementing occupational safety and health regulations in a multiple-choice response. One hundred and sixty-four (70.39%) agreed that lack of training was the main challenge in implementing OHS regulations while sixty-nine (29.61%) disagreed. Fifty respondents (21.46%) indicated that lack of finances was a challenge while one hundred and eighty-three (78.54%) said it was not. Ninety-two respondents (39.48%) affirmed inadequate facility to be a challenge while one hundred and forty-one (60.52%) disagreed. Forty-nine (21.03% of total respondents) said lack of motivation was a challenge while one hundred and eighty-four (78.97%) disagreed. Seventy-four (31.76%) indicated lack of enforcement to have been a challenge while one hundred and fifty-nine (68.24%) respondents said it was not a challenge in the implementation of occupational health and safety regulations. Based on the formal system of reporting accidents and injuries at the workplace, only eight (3.43% of total respondents) affirmed that there was a formal system compared to the two hundred and twenty-five (96.57%) respondents who said there was no formal system for reporting accidents and injuries at the workplace. Regarding the training of artisans on occupational safety and health (OSH), only twenty (8.58%) of the total respondents indicated that they had undergone training on OSH, while two hundred and thirteen (91.42%) respondents admitted that they had not received any training on OSH.

Concerning keeping a general register for recording workplace accidents and injuries, only four respondents (1.72%) affirmed the availability of a general register for recording the occurrence of accidents and injuries, while two hundred and twenty-three respondents (95.71%) said that records were not kept for reporting accidents and injuries. Five respondents (2.15%) said they were unaware of the records for accidents and injuries while only one (0.43%) of the total respondents was somewhat aware of the records-keeping for accidents and injuries. Workers' adherence to safety culture during

task performance using a questionnaire and interview guide was examined. From the finding, it was clear that the challenge in poor application of safety procedures was caused by lack of training (80.26%) and discomfort in wearing personal protective equipment (PPE) as identified by respondents. This is possible because only 9.58% had training on occupational health and safety (OSH) as against 91.42% who never had training. This implies that hazards and accident prevention require training and adherence to safety applications at all levels. Artisans could therefore be unskilled in applying proper safety rules in work performance which could be in tandem with accidents, hazards and risks of fire outbreaks. This finding also affirms the study by Akple et al. (2013) who found that only 40% had orientation and training on accident prevention at the different automobile workstations considered in his study.

Also, many artisans in the urban informal sector operated in an unhealthy and unsafe working environment (Chattopadhyay, 2005) which could lead to hazards such as accidents, injuries and risk of fire. This poor workplace condition could be attributed to inadequate safety and health ethics, thus, making health and environmental hazards predominantly evident in the informal sector (Chattopadhyay, 2005). The study also assessed artisan's health complaints resulting from sustained injuries and accidents during work performance and their sources of medical treatment. More than half of the study participants (59.66%) said they sought medical treatment from a health physician. These findings are in contrast to Mwatu (2011) who found out that 52.9% of spray painters did not consult a health professional for medical attention but sought medical help over the counter. However, the result of this study shows that auto-mechanics have good health-seeking behaviour since a little below half of interviewees experienced cut (48.07%) and back pain (45.59%) leading to work absenteeism.

Conclusion

In terms of gender, artisans were all male, relatively young with a mean age of 32.28, found in the age brackets 18-37, who represent the majority in the study. Most of the study participants were married. The proportion of respondents with junior high school education was high (59.23%). The years of working experience of workers was between 1-7 years with a mean age of 12.14 (SD=±9.10). The outlier in the mean was caused by the number of respondents who worked between the years 1-7. The objective was to determine workers' adherence to safety culture during job performance. The study recorded that the challenge in poor application of safety procedures was caused by a lack of training (80.26%), and discomfort in wearing PPE. Artisans who had training in occupational health and safety were 9.58%. This supports the fact that hazards and accident prevention requires training and adherence to safety application at all levels. The most frequently worn PPE among artisans were goggles (65.78%), nose masks (55.56%), and safety boots (84.44%). However, nearly all the employees claimed ownership of PPE. Hence, failure to PPE adherence may undermine health and safety promotion and may result in injuries and accidents. Additionally, the study also revealed that more than half of the employees (59.66%) sought medical treatment from a health physician. The study, therefore, concludes that vehicle artisans have good health-seeking behavior.

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Conflict of interest

The authors confirm that there is no conflict of interest involve with any parties in this research.

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