OCCUPATIONAL RISKS AND HAZARDS ASSESSMENT AMONG VEHICLE ARTISANS AT SUAME MAGAZINES, KUMASI, GHANA

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Abstract. Occupational health and safety have been an issue as far back as people has gained workplace employment. Occupational Health and Safety aims at; promoting and maintaining the maximum degree of physical, mental and social welfare of workers in all professions; preventing employees from health problems arising from inappropriate working conditions; protecting workers in their workplaces from risks resulting from factors adverse to health; positioning and sustaining a worker in a working environment that is appropriate to his mental and emotional ability and; the adaptation of work to the man and not a man to work. A cross-sectional study by design and analytical by type was adopted for the research and utilized both quantitative and qualitative approaches. A total of 233 interviewees 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. Employees were exposed to physical hazards such as noise (67.38%), heat (62.66%), and smoke (60.52%); chemical hazards such as petrol and diesel; and ergonomic hazards like prolonged standing (92.27%), bending (69.1%), squatting (64.3%), and lying under the car (63.95%). The study concludes that regardless of the educational qualification of artisans, exposure to work-related hazards still occurs.
Keywords: *occupational risks, occupational hazard, Swame Magazine, vehicle artisans*

Introduction

Occupational health and safety (OHS) has been an issue as far back as people has gained workplace employment (ILO, 2019). Occupational Health and Safety aims at; promoting and maintaining the maximum degree of physical, mental and social welfare of workers in all professions; preventing employees from health problems arising from inappropriate working conditions; protecting workers in their workplaces from risks resulting from factors adverse to health; positioning and sustaining a worker in a working environment that is appropriate to his mental and emotional ability and; the

adaptation of work to the man and not a man to work (Jafarian et al., 2016). According to WHO (2010), a healthy workplace is a safe working space in by-which employees and employers work together to create a dependable work environment mechanism for protecting and promoting the health, safety, and well-being of employees and the sustainability of the workplace. This takes into account the following needs as identified: "health and safety concerns in the physical work environment; health, safety and well-being concerns in the psychosocial work environment including organization of work and workplace culture; individual health resources in the workstation; and ways of engaging in the community to advance the health of employees, their dependents, and other members of the community" (WHO, 2010).

Besides occupational health and safety, 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). World health organization (WHO) prioritizes the work environment as adequate for health promotion. The workspace is one of the most critical environments affecting the physical, emotional, economic, and social well-being of employees (Alli et al., 2008; Chu et al., 2000) but the problem spreads beyond persons and their families even further (WHO, 2010). According to Obeng-Odoom (2011), in Ghana, a large proportion of informal sector workers are stuck in poverty, because their income is limited to getting themselves and their dependents out of poverty (Obeng-Odoom, 2011). Worldwide, growth revolves around skilled, committed, diverse and balanced workers in the economies' direct and indirect sectors. The expansion of the informal sector economy is a global trend due to an increase in population and insufficient job prospects in the structured sector as well as entrepreneurship (Amfo-Otu and Agyemang, 2016). This implies that small and medium businesses, and those in the informal sector, contribute to the creation of the majority of new jobs for the bulk of the working people. The informal economy has, therefore, become the hub of employment for young people and those who are adapting to radical reforms in African countries. Regrettably, the unstructured existence of the sector makes the employees in the company suffer from policies and legislative negligence. Besides, according to Obeng-Odoom (2011), employees within the informal sector could either be ignorant of safety concerns in their area of operation or they certainly cannot afford safety gadgets. As such, employees are vulnerably subjected to poor environmental conditions and other unsanitary conditions that pose health and safety threats (Obeng-Odoom, 2011).

Activities of vehicle artisans at Suame Magazine take place in the open space resulting in indiscriminate disposal of waste, and the release of hazardous substances, and fumes into the environment. These hazardous particles endanger workers' health, exposing them to different forms of pollution such as noise and air. It also creates unhygienic conditions and an atmosphere for workers. A risky working environment not only poses various health hazards to the health of the workers but also minimizes the productivity of the company. Work-related health and safety are critical issues today, as the job market grows. To maintain an acceptable level of occupational safety and health at the workplace, and an overall baseline image of the current workplace situation, various hazards and their possible health consequences are critical. This study, therefore, seeks to examine the occupational risks and hazards among vehicle artisans at Suame Magazine in Kumasi, Ghana.

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) as shown in Eq. (1).

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

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=0.22x233=51. For sprayers: 100/450=0.22x233=51. For mechanics: 250/450=0.56x233=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 the Occupational risks and hazards (ORH).

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=±11.31) was 33.28. Data on demographic characteristics about gender indicates that all of the respondents were male. 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=± 9.10) was 12.14.

Table 1. *Sociodemographic characteristics.*

Variables	Frequency (N=233)	Percentage (%)	Mean	SD
Occupation				
Sprayers	51	21.89	-	-
Welders	51	21.89		
Mechanics	131	56.22		
Age of respondents in category (yr)				
18-27	92	39.48	33.28	11.31
28-37	58	24.89		
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 (yr)				
1-7	103	44.21	12.14	9.10
8-15	53	22.75		
16-23	51	21.89		
24-31	15	6.44		
>32	11	4.72		

Occupational risks and hazards at the workplace

Table 2 reveals the risks and hazards faced by artisans in the work environment. According to the frequency of public holidays, twenty-one workers representing 9.01% always observed public holidays, ten respondents accounting for 4.29% often observe

public holidays, and thirty-nine respondents (16.74%) sometimes observed public holidays. Eighty-eight (37.77%) respondents rarely observed public holidays while the remaining seventy-five representing 32.19% never observed public holidays at all. On the frequency of break periods among the 233 respondents interviewed, seventy-three artisans (31.3 3%) always had break periods daily while thirty-five (15.02%) often had break periods. Thirty-four (14.59%) of the respondents sometimes had break periods while eighty-nine of the workers (38.2%) rarely had break periods during working hours. Only two respondents (0.89%) never had break periods. On the duration of break periods, as shown in table 2, seventy-eight employees (33.77%) acknowledged the duration of break periods to be less than 15 minutes. Furthermore, the study showed the duration of break periods by eighty-eight of the study participants (38.1%) to be between 15-29 minutes, forty-two respondents (18.18%) experienced 30-44 minutes of break periods, and eighteen (7.79%) respondents had 45-60 minutes duration of break period, while only five respondents (2.16%) had break periods of 60 minutes and above. Regarding the awareness of potentially harmful items within the workplace, of the 233 artisans recruited for the study, two hundred and thirty-two (99.57%) acknowledged being aware of harmful items while only one respondent (0.43%) said he had no idea such items exist. Some of the potentially harmful items acknowledged by the respondents include saw blades, working tools, electrical cables, car parts, rods, paints inhalation, dust etc.

Table 2. *Occupational risk and hazards at workplace.*

	Variables	Frequency (N=233)	Percentage (%)
	Frequency of public holidays		
	Always	21	9.01
	Often	10	4.29
	Sometimes	39	16.74
	Rarely	88	37.77
	Never	75	32.19
	Frequency of break periods		
	Always	73	31.33
	Often	35	15.02
	Sometimes	34	14.59
	Rarely	89	38.2
	Never	2	0.86
	Duration of break period (mins)		
	<15	78	33.77
	15-29	88	38.1
	30-44	42	18.18
	45-60	18	7.79
	>60	5	2.16
	Awareness of harmful materials		
	No	0	0
	Yes	232	99.57
	I don't know	1	0.43
Physical hazards	Frequency of being exposed to noise		
	Always	157	67.38
	Often	26	11.16
	Sometimes	35	15.02
	Rarely	11	4.72
	Never	4	1.72
	Source of noise		
	Machines		
	No	39	17.03
	Yes	190	82.97
	Source of noise		
	Vehicles		
	No	97	42.36
	Yes	132	57.64
	Source of noise		
	Tools		

No	69	30.13
Yes	160	69.87
Other source of noise		
No	225	98.25
Yes	4	1.75
Magnitude of noise		
Very loud	86	36.91
Loud	91	39.06
Moderate	46	19.74
Low	10	4.29
The frequency at which noise affect hearing		
Always	62	27.07
Often	53	23.14
Sometimes	73	31.88
Rarely	34	14.85
Never	7	3.06
Accident of injury occurred at work		
No	52	22.32
Yes	181	77.68
Type of injury or accident exposed during work		
Cold		
No	216	92.7
Yes	17	7.3
Type of injury or accident exposed during work		
Heat		
No	87	37.34
Yes	146	62.66
Type of injury or accident exposed during work		
Dry air		
No	161	69.1
Yes	72	30.9
Type of injury or accident exposed during work		
Dust		
No	72	30.9
Yes	161	69.1
Type of injury or accident exposed during work		
Electric shocks		
No	101	43.35
Yes	132	56.65
Type of injury or accident exposed during work		
Smoke		
No	92	39.48
Yes	141	60.52
Type of injury or accident exposed during work		
Gas emission		
No	171	73.39
Yes	62	26.61
Type of injury or accident exposed during work		
Vibration		
No	145	62.23
Yes	88	37.77
Type of injury or accident exposed during work		
Shortness of breath		
No	226	97
Yes	7	3
Activities and materials posing greatest risk at work		
Fire		
No	154	66.09
Yes	79	33.91
Activities and materials posing greatest risk at work		
Slip and fall		
No	192	82.4
Yes	41	17.6
Activities and materials posing greatest risk at work		
Trips and fall		
No	181	77.68
Yes	52	22.32
Activities and materials posing greatest risk at work		
Tools and equipment		
No	164	70.39
Yes	69	29.61
Activities and materials posing greatest risk at work		
Exhaust emission		

	No	149	63.95
	Yes	84	36.05
	Activities and materials posing greatest risk at work		
	Lifting loads		
	No	137	58.8
	Yes	96	41.2
	Activities and materials posing greatest risk at work		
	Working under car		
	No	129	55.36
	Yes	104	44.64
	Activities and materials posing greatest risk at work		
	Welding and cutting		
	No	198	84.98
	Yes	35	15.02
	Activities and materials posing greatest risk at work		
	Spraying		
	No	193	82.83
	Yes	40	17.17
	Causes of injury among workers		
	Sharp objects		
	No	67	28.76
	Yes	166	71.24
	Causes of injury among workers		
	Abrasions		
	No	202	86.7
	Yes	31	13.3
	Causes of injury among workers		
	Burns		
	No	166	71.24
	Yes	67	28.76
	Causes of injury among workers		
	Falls		
	No	195	83.69
	Yes	38	16.31
	Causes of injury among workers		
	Welding and cutting		
	No	199	85.41
	Yes	34	14.59
	Causes of injury among workers		
	Sprayings		
	No	188	80.69
	Yes	45	19.31
	Causes of injury among workers		
	Tools and equipment		
	No	170	72.96
	Yes	63	27.04
Chemical hazards	Familiarity with the content of chemicals		
	Yes	133	57.08
	No	89	38.2
	Chemicals linked with work		
	Chromium		
	No	219	93.99
	Yes	14	6.01
	Chemicals linked with work		
	Cadmium		
	No	223	95.71
	Yes	10	4.29
	Chemicals linked with work		
	Lead		
	No	180	77.25
	Yes	53	22.75
	Chemicals linked with work		
	Brake cleaner		
	No	137	58.8
	Yes	96	41.2
	Chemicals linked with work		
	Carburetor cleaner		
	No	154	66.09
	Yes	79	33.91
	Chemicals linked with work		
	Gasket remover		
	No	139	59.66

	Yes	94	40.34
	Chemicals linked with work		
	Part cleaner		
	No	169	72.53
	Yes	64	27.47
	Chemicals linked with work		
	Motor oil		
	No	91	39.06
	Yes	142	60.94
	Chemicals linked with work		
	Transmission fluid		
	No	125	38.2
	Yes	108	61.8
	Chemicals linked with work		
	Gear oil		
	No	89	38.2
	Yes	144	61.8
	Chemicals linked with work		
	Grease		
	No	95	40.77
	Yes	138	59.23
	Frequency of wearing PPEs		
	Always	76	32.62
	Often	28	12.02
	Sometimes	58	24.89
	Rarely	52	22.32
	Never	19	8.15
	Frequency of respiratory usage		
	Always	27	11.59
	Often	12	5.15
	Sometimes	24	10.3
	Rarely	70	30.04
	Never	100	42.92
Ergonomic hazards	Posture at work		
	Standing		
	No	18	7.73
	Yes	215	92.27
	Posture at work		
	Bending		
	No	72	30.9
	Yes	161	69.1
	Posture at work		
	Sitting		
	No	130	55.79
	Yes	103	44.21
	Posture at work		
	Squatting		
	No	83	35.62
	Yes	150	64.38
	Posture at work		
	Lying under car		
	No	84	36.05
	Yes	149	63.95
	Posture at work		
	Comfortability of posture		
	Yes	134	57.51
	No	81	34.76
	Somewhat	18	7.73
	Posture at work		
	Frequency of body pain by posture		
	Always	78	33.48
	Often	69	29.61
	Sometimes	53	22.75
	Rerely	23	9.87
	Never	10	4.29
	Body part affected		
	Back		
	No	72	30.9
	Yes	161	69.1
	Body part affected		
	Neck		
	No	104	44.64

	Yes	129	55.36
	Body part affected Waist		
	No	49	21.03
	Yes	184	78.97
	Body part affected Legs		
	No	143	61.37
	Yes	90	38.63
	Body part affected Shoulder		
	No	96	41.2
	Yes	137	58.8
Psycho-social hazards	Satisfaction with work		
	Yes	220	94.42
	No	5	2.15
	Somewhat	8	3.43
	Safety of work environment		
	Very safe	77	33.05
	Safe	99	42.49
	Unsafe	57	24.46
	Relationship with employer		
	Very good	190	81.55
	Good	41	17.6
	Fair	2	0.86
	Person injuries are reported to: Police		
	No	233	100
	Yes	0	0
	Person injuries are reported to: Supervisor		
	No	136	58.37
	Yes	97	41.63
	Person injuries are reported to: Employer		
	No	196	84.12
	Yes	37	15.88
	Person injuries are reported to: First aid officer		
	No	227	97.42
	Yes	6	2.58
	Person injuries are reported to: Pharmacist		
	No	144	61.8
	Yes	89	38.2
	Person injuries are reported to: Hospital		
	No	190	81.55
	Yes	43	18.45
	Person injuries are reported to: Nobody		
	No	195	83.69
	Yes	38	16.31

Physical hazards (PH)

Based on the frequency of artisans' exposure to noise, the study showed that one hundred and fifty-seven respondents (67.38%) were always exposed to noise, twenty-six (11.16%) were often exposed to noise, thirty-five respondents (15.02%) sometimes were exposed to noise, while eleven (4.72%) were rarely to noise. Only four artisans (1.72%) were never exposed to noise. Considering the sources of noise, machines were found to be a source of noise by one hundred and ninety respondents constituting 82.97% while only thirty-nine (17.03%) did not perceive machines as a source of the noise. Vehicle was acknowledged as a source of noise by one hundred and thirty-two respondents (57.64%) while ninety-seven (42.36%) did not. Also, regarding tools as a source of noise, sixty-nine (30.13%) did not recognize tools as sources of noise in the

workstation while the majority-one hundred and sixty (69.87%) did. Similarly, other sources of noise were indicated by four (1.75%) respondents which include grinding machines, humans and information centres while two hundred and twenty-five (98.25%) respondents did not identify other sources of noise. Correspondingly, the magnitude of noise as being very loud was affirmed by eighty-six (36.91%) respondents, and ninety-one (39.06%) participants said the magnitude of noise was loud. Forty-six participants (19.74%) said it was moderate while only ten (4.29%) admitted that it was low. Additionally, respondents were asked about the frequency at which noise affected hearing. Sixty-two participants (27.07%) indicated that noise affected their hearing always. Fifty-three participants (23.14%) said that noise often affected their hearing. Seventy-three (31.88%) were sometimes affected, while thirty-four (14.85%) were rarely affected and seven (3.06%) respondents were never affected by noise.

On the occurrence of accidents or injury at work, more than half which account for one hundred and eighty-one (77.68%) affirmed the occurrence of accidents or injuries at work, while fifty-two (22.32%) did not. In multiple choice responses, the majority of the respondents suffered during work from the following types of work-related injuries or accidents. One hundred and sixty (69.1%) suffered from exposure to dust, followed by one hundred and forty-six (62.66%) who suffered from exposure to heat. Next, one hundred forty (60.50%) suffered from smoke exposure, one hundred and thirty-two (56.65%) admitted suffering from electric shocks, likewise eighty-eight (37.77%) suffered from exposure to vibration, seventy-two (30.9%) suffered from exposure to dry air, sixty-two (26.61%) suffered from exposure to gas emission, while seventeen (7.3%) suffered from exposure to cold and only seven (3%) suffered from shortness of breath.

Concerning the activities and materials posing the greatest risk at work in multiple-choice responses, less than half of the respondents admitted being at risk with the under-listed activities: one hundred and four (44.64%) consented to work under the car; ninety-six (41.2%) engaged in the lifting of loads; eighty-four (36.05%) were exposed to exhaust emission; seventy-nine (33.91%) agreed to be at risk of fire. Sixty-nine (29.61%) admitted that tools and equipment posed the greatest risk at the workshop, while fifty-two (22.32%) saw trips and fall, forty-one (17.6%) experienced slips and fall, forty (17.17%) felt spraying posed the greatest risk, while thirty-five (15.02%) opted for welding and cutting as the greatest activity posing risk at work. From the multiple choice responses, one hundred and sixty-six (71.24%) of the respondents identified sharp objects to be one of the major causes of injury among employees. Abrasions accounted for 13.3%, burns, for 28.76% and falls, for 16.31%. Also, 14.59% was recorded for welding and cutting, 19.31% for spraying and then 27.04% for tools and equipment. These were less significant.

Chemical hazards (CH)

More than half of the study participants (one hundred and thirty-three or 57.08%) were familiar with the content of the chemicals they worked with. Eighty-nine (38.2%) respondents were not familiar with the chemical contents while eleven (4.72%) were somewhat familiar with the chemical content. The multiple-choice responses also revealed that two hundred and nineteen (93.99%) respondents were not aware of the chemical chromium linked to their work; two hundred and twenty-three (95.71%) as the majority were not familiar with cadmium; one hundred and eighty (77.25%) were not familiar with lead, and one hundred and thirty-seven (58.8%) were not familiar with

brake cleaner. One hundred and fifty-four participants (66.09%) had no idea about the linkage of carburettor cleaner to their work; one hundred and thirty-nine (59.66%) were not familiar with gasket remover; one hundred and sixty-nine (72.53%) were not also familiar with the contents of part cleaner, while one hundred and twenty-five (53.65%) were not familiar with the contents of transmission fluid used at their work environment. On the other hand, one hundred and forty-two (60.94%) expressed their familiarity with the contents of motor oil, one hundred and forty-four (61.8%) were familiar with the contents of gear oil, while one hundred and thirty-eight (59.23%) also said that they were familiar with the chemical content of grease used among the artisans. Other chemicals mentioned were hardener, thinner, bold sprayer; brake fluid, engine oil, petrol, hydraulic oil, paint, nitrocellulose and super shine.

On the frequency of wearing personal protective equipment (PPE) to protect oneself when working with chemicals, seventy-six (32.62%) always wore PPEs, twenty-eight (12.02%) often had PPEs on, fifty-eight (24.89%) sometimes wore PPEs, fifty-two (22.32%) rarely had PPEs on, and nineteen (8.15%) respondents never had their PPEs on while on duty. In addition, regarding the frequency of respirator usage whilst spraying, twenty-seven (11.59%) participants were always on a respirator. Only twelve (5.15%) respondents often wore respirators; twenty-four (10.3%) sometimes had respirators on while spraying; seventy (30.04%) artisans interviewed rarely had their respirators on while one hundred (42.92%) respondents never wore a respirator while spraying or working with other chemicals.

Egronomic hazards (EH)

The multiple-choice responses also showed that there are ergonomic hazards to the usual body posture while at work. Two hundred and fifteen (92.27%) respondents were standing most of the time during working hours; one hundred and sixty-one (69.1%) found themselves bending; one hundred and three (44.21%) were sitting; one hundred and fifty (64.38%) were squatting while one hundred and forty-nine (63.95%) were usually lying under the car. Analyzing the comfortability of the usual body posture at work, one hundred and thirty-four (57.51%) or more than half of the respondents said they were comfortable with their usual posture at work. Eighty-one participants (34.76%) said they were not comfortable with their body posture while at work, and eighteen (7.73%) respondents were somewhat comfortable with their usual body posture while at work. Of the 233 respondents interviewed, seventy-eight (33.48%) were always aware of the frequency of body pain caused by their body posture at work; sixty-nine (29.61%) were often aware of the frequency of body pain caused by posture at work. Fifty-three participants (22.75%) were sometimes aware of the frequency of body pain by posture. Twenty-three participants (9.87%) were rarely aware of the body pain due to usual body posture at work and only ten (4.29%) respondents were never aware of the frequency of body pain resulting from posture at work. Similarly, about the part of the body affected, the back was cited by one hundred and sixty-one (69.1%) respondents; the neck was cited by one hundred and twenty-nine (55.36%). One hundred and eighty-four pointed to the waist (78.97%), ninety (38.63%) respondents identified the legs, while one hundred and thirty-seven (58.8%) respondents named the shoulder.

Psycho-social hazards (PSH)

Work satisfaction among study participants was analyzed to understand the relationship between psycho-social hazards and work performed by artisans, the work environment, the relationship between employer and employee, and the mode of reporting occupational injuries. Two hundred and twenty respondents (94.42%) said they were satisfied with their work, five (2.15%) said they did not find satisfaction with their work, while eight (3.43%) said they were somewhat satisfied. The reasons expressed by the few for lack of work satisfaction were due to the high risks involved, lack of job insurance, low-profit margins, lack of job fulfilment, low level of safety on the job, unsafe work environment and stress. Evaluating the safety of the work environment, seventy-seven (33.05%) found the work environment to be very safe, ninety-nine (42.49%) said the work environment was safe and fifty-seven (24.46%) said the work environment was unsafe. On the relationship of employees with their employer, one hundred and ninety (81.55%) had a very good working relationship amongst them, forty-one (17.6%) said their relationship was good, while two (0.86%) said their relationship with their employer was fair.

Focusing on the personnel that workers reported occupational injuries to in multiple-choice responses, ninety-seven (41.63%) reported injury occurrence to a supervisor, thirty-seven (15.88%) reported to the employer, six (2.58%) reported to a first aid officer, eighty-nine (38.2%) saw the pharmacist, forty-three (18.45%) went to the hospital, while thirty-eight (16.31%) reported to nobody. None (zero %) reported occupational injury to the police.

Chi-square test: Analysis of variance to determine differences in break period by occupation

Table 3(i) and *Table 3(ii)*, the section presents the analytical findings on the analysis of variance to ascertain if there is a difference between the break periods of artisans by their occupation/workshop units. At a significance level of 0.05, evidence is established to conclude that there is a significant difference in break periods between one or two occupational groups (p-value=0.028). Furthermore, while maintaining overall α=0.05, we conclude that there is a statistically significant difference in the mean break period between Welders and each of the other two groups.

Table 3(i). *Analysis of variance to determine if there is a difference in break period by occupation.*

Source	SS	df	MS	F	Prob>F	p-value
Between groups	12.95	2	6.47	6.62	0.01	0.03*
Within groups	223.08	228	0.98	-	-	-
Total	236.03	230	1.03	-	-	-

Table 3(ii). *Comparison of break period by occupation (Bonferroni).*

Row mean-Col mean	Sprayers	Welders
Welders	-0.60	-
	0.01	-
Mechanics	-0.46	0.23
	0.001	0.48

Chi-square test of association between activities or materials posing greatest risk and workshop units

In *Table 4*, the findings show that variables such as the risk of fire (p-value=0.03), exhaust emission (p-value=0.01), lifting of loads (p-value=0.01), working under the car (p-value=0.01), welding and cutting of metals (p-value=0.01) and spraying (p-value=0.01) are significantly related with workshop units.

Table 4. *Chi-square test of association among activities or materials posing greatest risk and workshop units.*

Variables	Total (%)	Workshop unit/occupation			p-value
		Sprayers (%)	Welders (%)	Mechanics (%)	
Risk of fire					
No	66.09	17.6	10.73	37.77	0.03*
Yes	33.91	4.29	11.16	18.45	
Slip and fall					
No	82.4	15.88	19.74	46.78	0.06
Yes	17.6	6.01	2.15	9.44	
Trips and fall					
No	77.68	16.74	18.88	42.06	0.24
Yes	22.32	5.15	3	14.16	
Tools and equipment					
No	70.39	15.45	17.17	37.77	0.33
Yes	29.61	6.44	4.72	18.45	
Exhaust emission					
No	63.95	17.6	14.16	32.19	0.01*
Yes	36.05	4.29	7.73	24.04	
Lifting load					
No	58.8	15.88	15.88	27.04	0.01*
Yes	41.2	6.01	6.01	29.18	
Working under car					
No	55.36	18.45	14.16	22.75	0.01*
Yes	44.64	3.43	7.73	33.48	
Welding and cutting of metals					
No	84.98	20.6	10.3	54.08	0.01*
Yes	15.02	1.29	11.59	2.15	
Spraying					
No	82.83	5.15	21.89	55.79	0.01*
Yes	17.17	16.74	0	0.43	

Distribution of posture at work by workshop units

In *Table 5*, regarding the posture at work, the results from the analysis show that the majority of the respondents identified standing to be their frequent posture while at work, and the mainstreams were the mechanics.

Table 5. *Distribution of posture at work by workshop unit/occupation.*

Variables	Total (%)	Workshop unit/occupation		
		Sprayers (%)	Welders (%)	Mechanics (%)
Standing				
No	7.73	0.43	2.15	5.15
Yes	92.27	21.46	19.74	51.07
Bending				
No	30.9	7.73	4.72	18.45
Yes	69.1	14.16	17.17	37.77
Sitting				
No	55.79	16.74	7.3	31.76
Yes	44.21	5.15	14.59	24.46
Squatting				
No	35.62	8.58	5.15	21.62
Yes	64.38	13.3	16.74	34.33
Lying under car				
No	36.05	12.02	12.88	11.16
Yes	63.95	9.87	9.01	45.06

Chi-square test of association among awareness of risk and hazard and some selected socio-demographic characteristics

In *Table 6*, the study shows that there is no significant association between awareness of risk and hazards and any of the selected socio-demographic characteristics.

Table 6. *Chi-square test of association among awareness of risk and hazard and sociodemographic characteristic.*

Variables	Total (%)	Awareness of occupational risk and hazard			p-value
		Yes (%)	No (%)	Don't know	
Occupation					
Sprayers	21.89	21.89	0	0	0.68
Welders	21.89	21.89	0	0	
Mechanics	56.22	55.79	0	0.49	
Age of respondents (yrs)					
18-27	39.48	39.48	0	0	
28-37	24.89	24.89	0	0	0.49
38-47	22.75	22.32	0	0.43	
48-57	10.73	10.73	0	0	
>58	2.15	2.15	0	0	
Marital status					
Married	47.21	46.78	0	0.43	
Single	39.48	39.48	0	0	0.77
Co-habitation	12.02	12.02	0	0	
Widow/widower	1.29	1.29	0	0	
Educational qualification					
Non-formal education	6.01	6.01	0	0	
Primary school education	9.01	9.01	0	0	0.95
Junior high school	59.23	58.8	0	0.43	
Senior high school	23.61	23.61	0	0	
Tertiary education	2.15	2.15	0	0	
Years of work experience (yrs)					
1-7	44.21	44.21	0	0	
8-15	22.75	22.75	0	0	0.47
16-23	21.89	21.46	0	0.43	
24-31	6.44	6.44	0	0	
>32	4.72	4.72	0	0	

Exposure to occupational hazards

Table 7 shows results for exposure to occupational hazards. The findings indicate that one hundred sixty-eight (72.1% of artisans) were exposed to noise, while in contrast forty-three (18.45%) did not think they were exposed to noise and only twenty-two (9.44%) said they were somewhat exposed to noise. Regarding the time duration of exposure to noise in the category, a little above half or one hundred and twenty-three respondents (52.79%) indicated that they were 1-2 hours exposed to noise daily at the workstation. Forty-one respondents (17.6%) said they were 3-4 hours exposed to noise, sixteen (6.87%) said they were 5-7 hours exposed to noise and fifty-three (22.75%) respondents said they were 8-10 hours exposed to noise. The mean responses confirming the time duration (SD) of exposure to noise by artisans were calculated as 2.605±2.107. Furthermore, two hundred and sixty-six artisans (97%), apparently had awareness about the use of personal protective equipment (PPE) while at work.

Table 7. *Exposure to occupational hazards.*

Variables	Frequency (N=233)	Percentage (%)	Mean	SD
Exposure to noise				
Yes	168	72.1	-	-
No	43	18.45		
Somewhat	22	9.44		

Time duration exposed to noise (hrs)				
1-2	123	52.79		
3-4	41	17.6	2.61	2.11
5-7	16	6.87		
8-10	53	22.75		
Awareness about PPEs at work				
No	7	3	-	-
Yes	226	97		
Frequency of protective gear usage				
Always	96	41.2		
Often	31	13.3		
Sometimes	62	26.61	-	-
Rarely	36	15.45		
Never	8	3.43		
Protective gears used (N=225)				
Overall	68	30.22		
No	157	69.78	-	-
Yes				
Protective gears used (N=225)				
Gloves				
No	137	60.89	-	-
Yes	88	39.11		
Protective gears used (N=225)				
Goggle				
No	148	65.78	-	-
Yes	77	34.22		
Protective gears used (N=225)				
Nose mask				
No	125	55.56	-	-
Yes	100	44.44		
Protective gears used (N=225)				
Earplug				
No	216	96	-	-
Yes	9	4		
Protective gears used (N=225)				
Safety boots				
No	35	15.56	-	-
Yes	190	84.44		
Protective gears used (N=225)				
Helmets				
No	210	93.33	-	-
Yes	15	6.67		
Instances of protective gear usage				
When spraying				
No	181	77.68	-	-
Yes	52	22.32		
Instances of protective gear usage				
Working with sharps				
No	179	76.82	-	-
Yes	54	23.18		
Instances of protective gear usage				
Welding				
No	175	75.11	-	-
Yes	58	24.89		
Instances of protective gear usage				
Working under vehicles				
No	126	54.08	-	-
Yes	107	45.92		
Instances of protective gear usage				
Always				
No	208	89.27	-	-
Yes	25	10.73		
Ownership of PPEs				
No	21	9.01	-	-
Yes	212	90.99		
Example of PPEs owned by respondent				
Risk of burns				
No	145	62.23	-	-
Yes	57	24.46		
Somewhat	31	13.3		
Example of PPEs owned by respondent				
Exposure to fume inhalation			-	-
Yes	161	69.1		

No	45	19.31		
Somewhat	27	11.59		
Example of PPEs owned by respondent				
Exposed to dust				
Yes	154	66.09	-	-
No	42	18.03		
Somewhat	37	15.88		
Example of PPEs owned by respondent				
Risk of fire				
Yes	106	45.49	-	-
No	99	42.49		
Somewhat	28	12.02		

About the frequency of wearing protective gear while at work, ninety-six (41.2% of the respondents) always had their protective gear on; thirty-one (13.3%) often had protective gear at work. Sixty-two respondents (26.61%) sometimes had protective gear while at work. Thirty-six respondents (15.45%) rarely had protective gear and eight (3.43%) never had protective gear while at work. The various protective gears worn by artisans in multiple choice responses were; overall, one hundred and fifty-seven (69.78% respondents), gloves eighty-eight (39.11%) respondents, goggles seventy-seven (34.22%) artisans, nose masks one hundred (44.44%) workers, ear plug nine (4%) artisans, safety boots one hundred and ninety (84.44%) respondents, and helmets fifteen (6.67%) respondents. When artisans were asked about the instances of using protective gear, fifty-two (22.32%) responded that they had protective gear while spraying, fifty-four (23.18%) had protective gear when working with sharp objects, fifty-eight (24.89%) when welding, one hundred and seven (45.92%) when working under vehicles, and only twenty-five (10.73%) had their protective gear always. Regarding the ownership of personal protective equipment, the majority of the study participants of two hundred and twelve (90.99%) artisans owned some form of personal protective equipment namely goggles, gloves, nose masks, safety boots, overalls, helmets, respirators and socks respectively.

Below are views articulated by two of the interviewees, a mechanic and a sprayer, on awareness of using personal protective equipment while at the workplace. One of the respondents commented on PPE usage as follows:

> "*As a mechanic who has worked for 17 years, one of the most dangerous aspects of my work among others is working under the car without appropriate safety goggles because one is being exposed to a lot of debris and oil spillage from beneath the car and this can be tantamount to blindness if frequently exposed*".

Another 65-year-old man who is a sprayer with over 40 years of work experience commented as follows:

> "*Persistent exposure to and inhalation of chemicals can lead to several health implications. For instance, I work with dibenzoyl peroxide as a hardener often and I have been having eye and skin irritation. Besides, the chemical may likely be toxic to aquatic life in the environment…. Another risk and hazard found in my work area as a sprayer is exposure to shock, frequent noise and fan belt when working with my machine and all these can lead to adverse health effects if not guarded against through proper personal protective gargets*".

This section of the study considered responses to variables related to risk and exposure. One hundred and forty-five (62.23%) expressed that they were at risk of burns, one hundred and sixty-one (69.1%) said they were exposed to fume inhalation, one hundred and fifty-four (66.09%) responded yes to exposure to dust while one hundred and six (45.49%) artisans were at risk of fire.

Chi-square test of association among awareness of PPEs usage and selected socio-demographic characteristics

From *Table 8*, the findings show that there is no significant association found in the study between awareness of the use of personal protective equipment and some selected socio-demographic characteristics

Table 8. *Chi-square test of association among awareness of PPE usage and selected socio-demographic characteristic.*

Variables	Total (%)	Awareness of PPE usage		
		Yes (%)	No (%)	p-value
Workshop unit/occupation				
Sprayers	21.89	20.17	1.72	0.07
Welders	21.89	21.46	0.43	
Mechanics	56.22	55.36	0.86	
Age of respondents (yrs)				
18-27	39.48	37.34	2.15	
28-37	24.89	24.03	0.86	0.35
38-47	22.75	22.75	0	
48-57	10.73	10.73	0	
>57	2.15	2.15	0	
Marital status				
Married	47.21	46.21	0.86	
Single	39.48	37.34	2.15	0.34
Co-hanitation	12.02	12.02	0	
Widow/widower	1.29	1.29	0	
Educational qualification				
Non-formal education	6.01	6.01	0	
Primary school education	9.01	9.01	0	0.29
Junior high school	59.23	56.22	3	
Senior high school	23.61	23.61	0	
Tertiary education	2.15	2.15	0	
Years of work experience (yrs)				
1-7	44.21	41.63	2.58	
8-15	22.75	2232	0.43	0.25
16-23	21.89	21.89	0	
24-31	6.44	6.44	0	
>32	4.72	4.72	0	

Chi-square test of association among ownership of PPEs and selected socio-demographic characteristics

Table 9 shows that marital status (p-value=0.035) as a socio-demographic characteristic is significantly associated with ownership of PPEs.

Table 9. *Chi-square test of association among ownership of PPEs and selected socio-demographic characteristic.*

Variables	Total (%)	Ownership of PPEs		
		Yes (%)	No (%)	p-value
Workshop unit/occupation				
Sprayers	21.89	21.89	2.15	0.13
Welders	21.89	21.46	0.43	
Mechanics	56.22	49.79	6.44	
Age of respondents (yrs)				
18-27	39.48	33.48	6.01	0.06

28-37	24.89	22.75	2.15	
38-47	22.75	22.32	0.43	
48-57	10.73	10.3	0.43	
>57	2.15	2.15	0	
Marital status				
Married	47.21	45.49	1.72	
Single	39.48	33.48	6.01	0.04*
Co-hanitation	12.02	10.73	1.29	
Widow/widower	1.29	1.29	0	
Educational qualification				
Non-formal education	6.01	5.58	0.43	
Primary school education	9.01	7.73	1.29	0.79
Junior high school	59.23	54.51	4.72	
Senior high school	23.61	21.03	2.58	
Tertiary education	2.15	2.15	0	
Years of work experience (yrs)				
1-7	44.21	37.77	6.44	
8-15	22.75	21.46	1.29	0.10
16-23	21.89	20.6	1.29	
24-31	6.44	6.44	0	
>32	4.72	4.72	0	

Socio-demographic characteristics

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. In addition, 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.

Occupational risk and hazards at the workplace

The findings from the study show that the majority of the respondents (37.77%) rarely observed public holidays. Similarly, the frequency of daily break periods was rarely observed (38.2%) by artisans during the execution of work while the total duration of 15-29 minutes was observed as break periods whenever possible. This was indicated by 38.1% of the study participants. These statistics seemingly imply that workers in the informal sectors have no assigned and planned time frame for rest periods integrated into their daily schedules. As such, artisans made their own time for

rest and time for food based on the daily workload. One of the respondents said, "*If I have more work to do then I will not have time to rest. I will always ensure that I try to complete my tasks before resting. When there is not much to do, I can rest for hours while waiting. My rest period varies depending on the workload at hand*". This could signify the probability of workers being exposed to a higher risk of occupational hazards due to the degree of contact hours put into work.

This study affirms the findings of Kumi-Kyereme and Boachie-Mensah (2012) on working hours amongst informal sector employees in Cape Coast which showed that 56.7% of auto-mechanics had less than an hour rest on the job. Similarly, Asamoah (2011) also reported poor working conditions among employees in informal firms and Ametepeh et al. (2013) found that about 57.5% of the respondents did not observe both public holidays and break periods. This also implies that the artisan's working hours far exceeded the recommended time required by Ghana's Labour Law (2003) Act 651, Sub-Part 11-Hours of work and Sub-Part 111-Rest periods (ILO, 2019). This study also reveals that there is a high level of awareness regarding harmful materials in the work environment by nearly all the respondents (99.57%). These include blades, working tools, electrical cables, car parts, paints inhalation, chemicals and dust. This affirms the findings of Ametepeh et al. (2013) that 86% of mechanics are highly aware of the poisonous contents of the chemicals they use.

Physical hazards (PH)

Physical hazards are factors found within the workplace that can cause harm to the body without necessarily touching it and can be quite challenging to pinpoint the source. According to the study, physical hazards found at Suame Magazine include noise (67.38%), heat (62.66%), electric shocks (56.65%), and smoke (60.52%). These are an aspect within the environment that can progressively cause damage to the body without physically coming into contact with them. The research found that study participants were constantly exposed to occupational noise arising from their workplace. It was also noticed that workers had no ear plug while discharging their duties. A greater percentage of 67.38% of interviewees perceived noise exposure and admitted being frequently exposed to occupational noise among others on daily basis. This implies that they were directly exposed to the noise produced from the source during working hours every day. The sources of the noise were the various machines, vehicles, and tools used. This is similar to a study done in Anambra state, Nigeria by Eguvbe et al. (2017), who found that the average noise level was higher in the medium-scale industries by 76.2%. This indicates that workers in the automobile industries are perhaps exposed to some physical hazards like occupational noise, and are at risk of progressively developing noise-induced hearing loss. It also agrees with the finding of Ametepeh et al. (2013) who revealed that 94% of drivers are exposed to noise. According to Mirmohammadi et al. (2020), there is a likelihood of a possible synergistic effect of noise exposure in increasing malondialdehyde (MDA) and decreasing superoxide dismutase (SOD) (Mirmohammadi et al., 2020) since oxidative stress seems to have a significant pathophysiological role on hearing loss among employees in noisy jobs (Pinar et al., 2011).

Regarding the types of hazards that influenced injuries and accidents suffered during work among respondents at Suame Magazine, artisans identified the following variables; heat (62.66%), dust (69.1%), electric shocks (56.65%), and smoke (60.52%) as the most frequent. The occurrence of these hazards can be due to the nature of the

working condition. These findings are in line with Ametepeh et al. (2013) who found that 67% were exposed to dust and fire while 86% were exposed to smoke. Exposure to dust above the threshold can potentially lead to an increase in oxidative stress by raising lipid peroxidation (MDA) and lowering antioxidant enzymes (SOD) levels (Mirmohammadi et al., 2020). Also, exposure to electrical shocks and accidents could be associated with a poor electrical network (wiring system) within the working environment. Persons exposed to inappropriate wiring of electrical cables not only feel shocks but could be a potential cause of vehicular fire (Akple et al., 2013) and life-threatening. High exposure to occupational shocks can result in skin burns, respiratory arrest, cardiac effects, and musculoskeletal and neurologic damage. These effects can lead to respiratory depression, loss of consciousness, and body weakness (Spies and Trohman, 2006). Statistical data show that electricity is a significant killer among employees, particularly those carrying out tasks that involve electric cables (Batra and Ioannides, 2001).

Exasperating the plight of auto-mechanics at Suame is the scorching conditions in which they operate due to a lack of adequate cooling resources and facilities. Thus, they could be at risk of additional health consequences. According to Jacklitsch et al. (2016), workers exposed to extreme heat are at risk of heat stress, including heat stroke, heat exhaustion, and heat syncope. The outcome of occupational exposure to heat has been reported to include injuries, disease morbidity, reduced productivity, and death (Jacklitsch et al., 2016). This implies that there is a need for all-inclusive environmental and biological assessment, monitoring and screening of auto-mobile artisans to be re-educated on health risks related to working in extreme heat.

Chemical hazards (CH)

A chemical hazard refers to any chemical within the work environment that an employee is exposed to either in the form of liquid, solid or gas. This induced hazardous exposure can be short or long-term, acute or chronic and exposure routes can be inhalation, ingestion, injection or dermal contact. From the research, respondents were frequently exposed to both petrol and diesel and exhaust emissions. Petrol and diesel have been recognized worldwide as priority pollutants due to their toxicity and carcinogenicity. Diesel contains carcinogenic properties and exhaust emissions contain different pollutants such as carbon monoxide, nitrogen oxides and Sulphur oxides and can cause cancer of the aero-digestive tract (Khanna and Gharpure, 2017). These pollutants are present in automobile garages and auto mechanics could likely be at risk of exposure to these chemicals. This is because most auto-mechanics disclosed pipetting diesel and petrol fuel with their mouth from in-depth interviews and observations made. The implication is that continuous contact with these chemicals can lead to cancer of the lips, tongue, and damage to salivary glands, gums and oral cavity tissues among others (Khanna and Gharpure, 2017). This finding is similar to Ametepeh et al. (2013) in his study on occupational health and safety of the informal service sector who found that drivers are exposed to diesel fuels containing carcinogenic properties and exhaust emissions.

Potentially hazardous chemicals continue to be present within the auto-mobile work environment and contact with these chemicals is apparent. Exposure to hazardous chemicals in auto-mechanics could be from waste chemicals inappropriately disposed of in the storage container. It can also be from contaminated rags used for cleaning spilt oils (Ametepeh et al., 2013). This implies that artisans in automobile garages could be at

risk of frequent exposure. Also, contact with these chemicals can serve as prospective hazards to environmental pollution besides the health hazards they pose (Pathberiya et al., 2017). Artisans in the automobile sectors should therefore be familiar with the content of the various chemicals exposed during work performance and within their work environment. Hence, stringent decontamination procedures and caution will be taken in handling chemicals. The result from this survey disclosed that 57.08% of the study participants claimed to be familiar with the content of the chemicals they work with. This is contrary to the statistical figures obtained from the questionnaire administered on the chemicals linked to their work. The high response rate by the majority of the interviewees responding to the under-listed chemicals indicated that artisans were either ignorant or not familiar with the chemicals they worked with. The chemicals included; chromium 93.99%, cadmium 95.71%, lead 77.25%, brake cleaner 58.8%, carburettor cleaner 66.09%, gasket remover 59.66%, part cleaner 72.53%, and transmission fluid 53.65%. The result from the researcher's assessment could however be deduced that respondents are not familiar with the chemical contents they work with. This could perhaps be influenced by the low level of educational qualification and the years of work experience of the artisans. The chemicals identified above correspond with the findings of Pathberiya et al. (2017) that chromium, cadmium and lead among others are found within auto-mobile workshops and are all sources of environmental pollution. In addition, the lack of awareness of the chemical contents may have influenced the artisans' compliance with the frequency of wearing PPEs and respirators to protect themselves against hazardous chemical contents and substances such as fumes, exhaust emissions and dust.

Ergonomic hazards (EH)

Ergonomic hazard (EH) refers to any physical factor or condition such as manual handling, furniture, equipment, repetitive movement, awkward posture and workplace designs found within the work environment that hurts. Workers in the informal sectors are exposed to various ergonomic hazards related to factors ranging from load lifting, work posture and others which can easily produce outcomes of accidents and failure to maintain workplace safety regulations (Akple et al., 2013). From the study, there were varied categories of perceived ergonomic health hazards challenging artisans in informal settings due to the various tasks they perform. This study divulges the awkward postures regularly used by artisans at Suame Magazine, zone 18. These postures include prolonged standing (92.27%), bending (69.1%), squatting (64.3%), and lying under the car (63.95%). It was not surprising when the majority of the interviewees reported back, neck, waist and shoulder pains as the most affected body parts which also confirm the findings of Nag et al. (2016). The findings in the research also agree with the study by Amfo-Out and Agyemang (2016) who reported that auto mechanics assumed awkward posture when working under the vehicles and that 78% affirmed body and joint pains after working periods. The implication therefore can result in musculoskeletal, body and joint pains. Despite the awkward position artisans are exposed to at work, respondents in this study still ascertained posture comfortability. This may be because they have been working under these postures over time and have had to adapt to them without knowing the health hazards associated with their working positions. Also, respondents may not have connected any health-related occurrence in their lives to the hazards resulting from the work they do.

Psycho-social hazards (PSH)

Psychosocial hazards are the aspects of the work design and management, its social and organizational frameworks that may have the potential to psychosocial harm (Lovelock, 2019). The workplace environment is very vital to workers' health since there is a growing awareness that individuals are social beings and the social context shapes health outcomes (Lovelock, 2019). When psychosocial hazards are reduced at the workplace, an increase in production is likely to be guaranteed in any organization. Workers' exposure to poor and unfriendly workplaces can result in occupational health complaints such as work stress, injury and accident. Accordingly, it can also affect employees' motivation and decrease productivity. Lack of work satisfaction and elongated hours at work can also lead to psychosocial hazards such as work stress. This study examines workers' satisfaction. The findings show that nearly all the respondents (94.42%) experienced work satisfaction. The remaining respondents said lack of work satisfaction was caused by work stress, lack of insurance coverage, low-profit margins, high risks, low safety and unsafe working conditions. This affirms the findings of Mersha et al. (2017) who said that the odds of not having job satisfaction increase the risk of occupational injuries by four folds in comparison to employees satisfied with their job (OR = 4.82, 95% CL (2.75-8.46) (Mersha et al., 2017). This study also examines the relationship between employer and employee. It was discovered that more than half (81.55%) of the study participants had a very good working relationship with their employers. This finding shows the connection between good working relationships, job satisfaction and an increase in production. When employers and employees are happily working together, they may generate a positive attitude towards their work. This means that when a mutual relationship exists between employees and employers, healthy working condition is likely to occur. This finding is in line with Xesha et al. (2014) who found that relationship plays a vital role in business and contributes to its growth.

Exposure to occupational hazards

The research found that artisans are exposed to multiple occupational hazards such as work-related noise 72.1% with a mean time duration of 2.605±2.107, heat 62.66%, dust 69.1%, electric shocks 56.65%, smoke 60.52%, sharp objects 71.24% and awkward postures as mentioned in the previous pages. This is similar to the results of Nag et al. (2016) who found dusty and hot environments, poor ventilation, and inappropriate work postures as occupational exposure that poses risk. Knowledge of personal protective equipment (PPE) while at work was also explored. The result showed that 97% of the study participants had good knowledge about the different PPE required for the work. This contradicts the finding of Nag et al. (2016) who said that artisans engaged in welding activities lacked knowledge of significant PPE requirements connected with their work.

The research findings also revealed that interviewees understood the importance of wearing PPE to give protection from accidents and injuries. Some of those who wore PPE did not wear the recommended PPE for the job. The consistency of wearing PPE was reduced although less than half (41.2%) of the respondents said they always wore PPE while at work. This is consistent with the study by Apreko et al. (2015) who stated that 45.8% of their respondents agreed to wear the prescribed PPE at work. It was startling as those who did not wear the required PPE such as gloves (60.89%), helmets

(93.33%), and earplugs (96%) said they were not comfortable wearing them. Some said it reduces the speed of work and would only wear them when the need arises. Few of the respondents said PPE are expensive to acquire. As such, it was observed that most of the respondents sustained a lot of hand injuries from burns, cuts and electric shocks which confirms the findings of Apreko et al. (2015). This general finding regarding knowledge of PPE usage while at work implies that even though nearly all of the respondents are aware of the significance of PPE usage, they do not feel comfortable wearing them. This outcome is somewhat similar to the findings of Apreko et al. (2015) who found that the majority of artisans understood the need for PPE usage. However, it contradicted his conclusion that artisans were willing to practice it.

Additionally, the most frequently worn PPE among respondents was equally identified as goggles (65.78%), nose masks (55.56%) and safety boots (84.44%). Nearly all the respondents (90.99%) claimed ownership of the PPE they used. The health hazards of PPE negligence were similarly assessed and the following were identified by respondents namely the risk of burns 62.23%, fume inhalation 69.1%, dust exposure 66.09% and a little below half (45.49%) acknowledged the risk of fire. This implies that employees in the automobile sectors are engaged in different occupations and exposed persons may be at risk of a variation of job-induced health hazards. This is because failure to PPE adherence may undermine health and safety promotion and may result in injuries and accidents. Therefore, since PPE usage is critical in safeguarding workers' health and safety in informal settings like automobile garages, recommended PPE must be worn by workers appropriately during work performance.

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 study found that there is a high level of awareness by nearly all the respondents regarding harmful materials in the work environment. These include blades, working tools, electric cables, car parts, paints inhalation, chemicals and dust. The study revealed the following physical hazards found at Suame Magazine namely: noise (67.38%), heat (62.66%), electric shocks (56.65%), and smoke (60.52%). It was also noticed that workers had no ear plug while discharging their duties. The sources of the noise were the various machines, vehicles, and tools used. On the types of hazards that influenced exposure to injuries and accidents during work, respondents identified the following: heat (62.66%), dust (69.1%), electric shocks (56.65%) and smoke (60.52%) as the most frequent. The occurrence of these hazards is likened to being influenced by the working condition.

From the research, the study concludes that vehicle artisans are frequently exposed to both petrol and diesel and exhaust emission. Petrol and diesel are priority pollutants due to their toxicity and carcinogenicity. Diesel contains carcinogenic properties and exhaust emissions contain different pollutants such as carbon monoxide, nitrogen oxides and Sulphur oxides and can cause cancer of the aero-digestive tract. The study concludes that vehicle artisans are at risk of exposure to these chemicals since they pipette diesel and petrol fuel with their mouths. Also, artisans' exposures to these

chemicals are from inappropriate disposal of waste chemicals from the storage container and contact with contaminated rags used for cleaning spilt oils. Although artisans claimed to be familiar (57.08%) with the chemical content they work with, the study concludes that artisans are either ignorant or not familiar with the chemicals linked to their work. The study divulges the awkward postures regularly used by artisans. The study concludes that prolonged standing (92.27%), bending (69.1%), squatting (64.3%) and lying under the car (63.95%) are the awkward postures found among vehicle artisans. The health implications associated with ergonomic hazards were identified as back, neck, waist and shoulder pains. Despite the awkward postures artisans are exposed to at work and the associated health hazards named, the study concludes that artisans still ascertained posture comfortability since they have been working under these postures over time. On psycho-social hazards, nearly all the employees experienced work satisfaction (94.42%). The few who experienced no work satisfaction attributed it to work stress, lack of insurance coverage, low-profit margins, high risks, low safety and unsafe working conditions. Similarly, 81.55% of workers had a very good working relationship with their employer. On the issue of elongated hours at work, 37.77% of the workers rarely observed public holidays and break periods (38.2%) and a total of 15-29 minutes were observed as break periods whenever possible. The study concludes that a low prevalence of psycho-social hazards exists among artisans at Suame Magazine.

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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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