



## **Occupational Health and Safety Issues among Artisans in the Bibiani Municipality**

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**Abstract:** This study sought to identify and document key issues affecting occupational health and safety among artisans in the informal sector in the Bibiani Municipality of the Western North Region of Ghana. To realize this objective, a descriptive cross-sectional study using the qualitative approach was employed. This was done after ethical clearance had been obtained from the Ghana Health Service Ethics Committee and prior consent sought from all participants and managers of the study sites. A total of fifteen artisans participated in the study. The artisans spanned three major categories namely: fabrication, construction, and auto mechanic. A semi-structured interview guide was used to obtain responses from the participants through in-depth interviews. Valuable notes were also made from observations during the interview process. Data from the interview were transcribed, coded, and analyzed thematically. Firstly, most respondents displayed adequate knowledge on the concept of occupational health and safety especially in the area of hazard identification. Secondly, most of the respondents showed positive attitudes toward occupational health and safety. This was evident in their expressed prioritization of occupational safety among all other factors needed to be productive at work. Thirdly, the artisans exhibited an appreciable level of occupational safety practices. Each respondent used at least one PPE on a regular basis. Finally, it was observed that emergency preparedness of the respondents in the area of first aid responses and fire outbreak management was inadequate. The findings showed that there is more room for improvement for the artisans in the informal sector with regard to their knowledge, attitudes, and utilization of safe practices. There must be regular training for artisans to help update their knowledge and practices on occupational health and safety issues. The district and municipal authorities together with the Environmental Protection Agency (EPA) must organize such trainings on a regular basis for artisans. Artisans must be strongly encouraged to join well-organized associations to make such trainings effective. There must be a national law targeting occupational health and safety issues for workers in the informal sector, with an enforcement regime visible at the local level. This will help improve compliance and minimize the incidents of workplace injuries and ill-health.

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**Keywords:** Health, artisans, health and safety, occupational health

### **1. INTRODUCTION**

People leave their homes every day in pursuit of daily livelihood. Others work within their home environment. Regardless of their place of work, people may face varied risks in the line of duty. This brings to focus concept of occupational health and safety (OHS). Occupational health and safety encompass the various disciplines that deal with the welfare, health, and safety of people at their workplace. Through occupational injuries and diseases, people lose their livelihoods with the attendant burden on their families and others. The economic cost of work-related illnesses and injuries range from 1.8% to 6% of gross domestic product (GDP) in terms of country estimates, with the International Labor Organization (ILO) average being 4% (Takala et al., 2014).

Having access to adequate occupational health and safety services remains a challenge in many places. It has been estimated that access to adequate OHS services is available to only about 5% to 10% of workers in developing countries and 20% to 50% of workers in industrialized countries (Lucchini & London, 2014). Organization of occupational health and safety varies from one jurisdiction to the other. A global survey of 49 economies which constitute 70% of the world's labor force reported that a mixture of curative and preventive services existed with the preventive section relatively lower (29%) and only a third (33%) of OHS financing being done by employers (Rantanen et al., 2017). The International Organization for standardization (ISO) has set standards for occupational safety. The current one is ISO 45001 which was published in the first quarter of 2018. It is aimed at reducing occupational diseases and injuries whilst promoting and preserving mental and physical health (International Organization for Standardization, 2018). In the United States, organization of occupational health and safety has evolved over the last 5 decades with the advent of the Occupational Safety and Health Act of 1970, which provided for a research, recommendations and guidance wing called NIOSH (National Institute Of Occupational Safety and Health), an implementation body called OSHA (Occupational Safety and Health Administration), and a support platform for employers by both NIOSH and OSHA (Howard & Hearl, 2012). The OHS issues came up early in Southern Africa after the discovery of gold in the late 19<sup>th</sup> century and it is largely private-sector led in the mining industry compared to the public sector (Masekameni et al., 2020).

Safety and health in the workplace are pertinent all over the world. Hygienic and safety conditions are important in ensuring the health and safety of workers. Failure to provide such conditions allows injuries to fester at the workplace. An estimated 2.3 million deaths occur annually in the world, 2 million related to work-related diseases, and 0.3million related to occupational injuries (Takala et al., 2014). Up to 2.4million occupational accidents occurred in Europe in 2009/2010, leading to 4500 fatalities with 90,000 of them permanently disabled (Jørgensen, 2016). According to the Pan American Health Organization, a total of 25,667 disability adjusted life years was lost to a host of occupational incidents ranging from exposure to airborne particles to accidents in 2013 (Ivan, 2013). Workplace injuries and fatalities appear to be disproportionately high among males with the European Union reporting that males accounted for 94% of occupational mortalities (The Journal of Men's Health and Gender, 2013). Populous India suffers close to 48,000 occupational deaths annually from an estimated 37 million accidents with an average of 4 days of absence from work (Patel & Jha, 2016) A study in South Africa implicated occupational injury as one of the causes of unnatural deaths in the country, accounting for 17% of deaths among miners in a cohort of 40,034 between 1992 and 2008 (Lim et al., 2011). Disability associated with occupational injury has been described as a predictor for early retirement, with one study in South Africa suggesting a 15% chance of a construction worker being permanently disabled from a construction-related accident while at work (Manu et al., 2019).

Most quarry workers interviewed at Miotso in the Ningo-Prampram District of Ghana had increased risk of developing a respiratory condition such as silicosis and they worked without the requisite personal protective gear (Apenteng & Asare, 2016). Workers face various forms of hazards in the line of duty. These include, but not restricted to chemical hazards, biological hazards, physical hazards, ergonomic hazards, and a host of psychosocial factors. Common physical hazards at the workplace include noise, sharp ends of machinery, and heat emanating from machinery. Hearing impairment can result from exposure to excessive noise; workers can sustain cuts from sharp edges of devices or sustain burns from hot surfaces. Common biological hazards include microorganisms such as viruses and bacteria. When these microbes are inhaled by workers, they may get infected with certain respiratory diseases. Anthrax is a bacterium that causes respiratory illness when people inhale them at their workplace. Chemical hazards can emanate from several sources such as smoke, quarry dust and sawmills. Workload and stress are forms of psychosocial hazards that workers face.

Work-related injuries and disorders are rampant and pervasive around the world. Frequent standing, sitting, lifting and bending are inevitable at the workplace, making musculoskeletal pain a logical consequence. About 44% of work-related ill-health in the United Kingdom is attributable to musculoskeletal disorders (Chib & Kanetkar, 2014). The situation is no different in Sub-Sahara Africa. Out of over 60,000 workers surveyed in Zambia, 8.1% reported having been injured in the last 12 months from work-related causes (Siziya et al., 2010). Close to 20% of male electronic waste workers surveyed in Accra, reported having sustained a form of work-related injury within the past 6 months (Burns et al., 2019). Occupational health and safety is a multidisciplinary field. The work environment and regulatory frameworks all revolve around the human factor,

which is at the center of occupational health and safety. Workers' awareness, attitudes, and specific practices within their environment impact on their safety or otherwise at their workplaces.

A study in the Iranian petrochemical industry found out that more than half of respondents (52%) had low knowledge of occupational health and safety (Nasab et al., 2009). In Gujarat, India, the knowledge of construction workers on occupational hazards and prevention was low, with a resultant underutilization of personal protective equipment, leading to injuries (Jasani et al., 2016). It had been reported that only 18% of South African workers reported having knowledge about legislation regarding occupational health and safety in the country (Pilusa & Mogotlane, 2018). However, in Nigeria, the majority of sawmill workers surveyed (89%) knew of sawdust as an occupational hazard (Onowhakpor et al., 2017).

Workers are expected to translate their knowledge on occupational health into practice if the needed intrinsic and extrinsic motivations are available. Among some textile dye workers in Nigeria, although the majority had fair knowledge and attitude on occupational hazards, their lack of observance of safety practices brings to attention the need for direct supervision and retraining (Okafoagu et al., 2017). The objective of this study was to identify and record major concerns influencing occupational health and safety among artisans working in the informal sector in the Bibiani Municipality of the Western North Region of Ghana.

## **2. MATERIALS AND METHODS**

### **2.1 Study design and type**

This was a descriptive cross-sectional study with a qualitative research design, using the phenomenological approach. This method explores shared experiences among a particular group. Interviews and observation are commonly adopted in this approach. The design employed was intended to explore the research questions and did not intend to offer final and conclusive solutions to existing problems. Besides, this study design was employed to determine the nature of the problem, and not intended to provide conclusive evidence, but contribute to a better understanding of the situation. In most cases, interviews are conducted with a group of individuals who have first-hand knowledge of an event, situation, or experience (Chambers, 2013). Through this approach, a researcher may develop a general meaning of the event, situation, or experience and arrive at a deeper understanding of the phenomenon.

### **2.2 Sampling technique and size**

The study population was artisans from the informal sector within the Bibiani municipality. The data on their number was not readily available. However, artisans in Bibiani span several sectors, such as construction, auto mechanic industry, and fabrication. Purposive and convenience sampling methods were used to recruit respondents (employers and employees) in this study. A minimum of one employer and two employees were selected from each of the three main subsectors of artisans (construction, auto mechanic industry, and fabrication). In all, fifteen artisans were sampled. A criterion for selection was a minimum of one year of experience in the trade and a minimum age of 18 years. Apprentices who had served less than one year were excluded from the study. Also, there was no sample size calculation, be that inquiries were required until saturation occurred. The maximum of fifteen sampled participants were large enough to obtain feedback for most issues regarding OHS. (Chambers, 2013) Obtaining most or all of the OHS issues led to the attainment of saturation. Saturation occurred when adding more participants to the study did not result in additional perspectives or information. There are no specific rules when determining the appropriate sample size in qualitative research. Qualitative sample size may best be determined by the time allotted, resources available, and study objectives (Sim et al., 2018, 2018)

### **2.3 Data collection tools**

A one on one in-depth interview guide was used to collect data from artisans who resided in the municipality. Although the guides were written in the English language, they were translated verbally into the local language (Twi) which enabled communication with participants (artisans) who did not understand the English language. The responses of the respondents during the interview were recorded (artisans with at least one year working experience) were interviewed at their workplace separately as per an interview schedule. The purpose of the study was explained to the respondents and consents were sought from them to be part of the study. The interview guide included five sections. Section 1 sought to measure demographic characteristics which included age, religion, status at workplace, the highest educational level reached and year (s) of service. Section 2 assessed the knowledge of the artisans on OHS. Section 3 determined the attitude of the artisans towards

OHS. Section 4 determined the practices of artisans on OHS and finally, section 5 determined the key occupational health and safety issues in the Municipality. The credibility and transferability were determined via pre-testing. The interview guide was pretested in some communities in the Sefwi Bekwai sub-district, with 20 artisans. Which had similar environment and demographic characteristics as the communities in the Bibiani Municipality and the necessary corrections were made before the guide was sent to the field for data collection. The one on one interview data were collected at workplace of the artisans. The in-depth interviews were recorded with a tape recorder during the data collection procedure. This was made known to respondents. They were given the option to participate or decline to be part of the study.

## 2.4 Data analysis

Data analysis followed the coding of all the audio records of the interviews and was reviewed on daily basis. Each of the audio recorded interviews was repeatedly listened to and transcribed verbatim and also were translated into English language by the Principal Investigator (PI). Data collected were analysed manually, but thematically. Quotes of respondents were presented to support the issues discussed. To mitigate any potential loss of original meaning during word-to-word translation from Twi to English, much emphasis was placed on the overriding meaning rather than specific word choices during analysis.

## 3. RESULTS

### 3.1 Socio-demographic characteristics of respondents

The socio-demographics characteristics of respondents included in the study were: age, religion, occupational status, years of service, educational status, status at workplace. The 15 respondents who were interviewed were aged 18 to 40 years and above. Five were aged 18 to 24 years, representing 33.3% of the respondents. Four were aged 25 to 32 years, representing 26.6% of the respondents. Another five were aged between 33 and 39 years. Only one respondent was above the age of 40 years.

Christians formed the majority of the respondents who were interviewed representing 80% with the remaining 20% being Muslims. Out of the occupational status captured during the interviews, five were mechanics representing 33.3%. There were two carpenters and a tiller among the respondents. With regard to the number of years served in their respective trades, eight out of the fifteen respondents had served 1 to 5 years representing 53.3%. Three had served between 6 and 10 years (20%) with the remaining four having served above 10 years (26.7%). Out of the 15 respondents that were interviewed, only one of them terminated their education at the primary school stage. A third (33.3%) of the respondents had junior high school as their highest education attainment. About 60% of the respondents had either senior high school or technical/vocational level of education.

**Table 1 Socio-demographic characteristics of respondents**

Variable	Frequency	Percentage (%)
<b>Age</b>		
18-24	5	33.3
25-32	4	26.7
33-39	5	33.3
40 and above	1	6.7
<b>Religion</b>		
Christianity	12	80.0
Islam	3	20.0
<b>Occupation</b>		
Mechanic	5	33.3
Carpenter	1	13.3
Welder	3	18.8
Mason	4	26.7
Tiler	1	6.3
<b>Years of service</b>		
1-5 years	8	53.3
6-10 years	3	20.0

Above 10 years	4	26.7
<b>Highest level of education</b>		
Primary	1	6.7
Junior High	5	33.3
Senior High/tech/vocational	9	60.0
<b>Status at workplace</b>		
Apprentice/employee	9	60.0
Employer/supervisor	6	40.0

### 3.2 Knowledge of artisans on occupational health and safety

According to the results of this study, the respondents in Bibiani Municipality had an 84.1% degree of awareness about the occupational hazards that they faced and their adherence to the safety measures that were implemented in the workplace. It was determined that the respondents had appropriate knowledge regarding the health and safety measures in place at their job. The bulk of their responses focused on the notion of occupational safety and health, their personal experiences with hazards in the workplace, and the resources connected to OHS that they make use of.

The quotes below summarize their views and understanding of OHS:

*"Thank you. My work deals with tiles. It entails precautions to avoid injury. First and foremost, to make sure you don't get injured by the tiles. A piece of the tile can chip off and hurt you. It also involves wearing of safety boots. Also, we use electric machines to cut the tiles and it generates a lot of noise that can affect your hearing so we have gadgets that we use to protect our ears. At other places, we use helmets to protect our heads from falling objects. We also use reflectors on our clothing for easy identification at night. These are some of the things I can say about safety at my workplace. In case you have any further questions, you can ask me".*

- Respondent 1, male, aged 35 years, Tiler (IDI)

*"I know a lot about occupational safety. This includes control of certain workshop behaviours. For instance we must not distract a colleague who is working by spanking them or whistling in their ear (he paused to think) Safety protects the lives of artisans at the workplace (looking at the atmosphere) For example; we are not supposed to spill oil on the floor. Such a spillage can cause environmental degradation by polluting nearby water bodies such as wells. This can endanger aquatic life or the lives of humans who obtain drinking water from such a source (very enthusiastic in his views). (Bell rings in the background)".*

-Respondent 7: 23 year old mechanic

With regard to their knowledge on what constituted hazards at their workplace, this is what some of the respondents had to say:

*"Workplace hazards at my workplace include fall from a height, a hammer hitting someone's hand, lifting a heavy load leading to muscle strain, trips, falls and near misses."*

-Respondent 2, 42 year old carpentry supervisor

*Hazards at my workplace are many. Let me start with sliding doors before I come to masonry: Glassware is a major hazard whilst working with sliding doors. The cutting machine can also cause injuries when handled poorly whilst working on a profile. In masonry, wet cement is hazardous. It can cause blindness if it splashes on the eye. Poor handling of a shovel can cause injury. The handle of a wheelbarrow can also cause injuries at the workplace: the pointed handles can slip and hurt one's loins.*

-Respondent 4, a 25 year old masonry and sliding door apprentice

### 3.3 Sources of knowledge on occupational health and safety



The respondents obtained information on occupational health and safety from varied sources. Some obtained their information from the electronic media; others obtained theirs from training sessions both within their workplaces and outside. There were respondents who obtained a lot of information through a well-structured training regime set up by their employer and supervisor. This is how they described their source of information on OHS and training:

*"I obtain information on safety from different sources including the media, peers, and workshops. I remember recently I attended a safety training held at Shangrila Hotel in Accra. They gave us training on safety. The work itself also gives us experience and knowledge about safety. It entails cutting, and one risk sustaining a cut when precautions are not taken. We pick lessons from all these."*

-Respondent 1; a 35 year old tiler

*"I obtain most of my information on safety at the workplace, primarily from our scheduled safety meetings..... We have fixed dates for safety meetings. It takes place three times in a week. It is organized on Mondays, Wednesdays, and Fridays. We learn a lot of things at these training sessions. These include workshop behavior, near miss, material safety data, environmental degradation, waste segregation..... Our supervisor, an engineer with many years of experience from the mining industry is the main instructor for most of these sessions. Each session lasts an hour."*

-Respondent 7; 23 year old mechanic

### **3.4 Attitudes of artisans towards occupational health and safety**

In general, most of the respondents (12 out of 15) representing 80% had a positive attitude towards occupational health and safety principles. They narrated how adherence to safety was important in protecting them at the workplace. The quotes below reflect the general attitude of the respondents toward OHS:

*"I get to hear information about safety from sources such as the television, radio, and also rely on previous knowledge acquired during early school days. For example when you're using the chisel, you need to wear gloves; when you are removing a block, you need to wear a helmet; wear safety boots to prevent cuts from shovels". He further added that: "Ehm.....I have bought helmets, gloves, and boots to be used at the workplace. All these protect us at the workplace"*

- Respondent 3, male, aged 37 years, Mason supervisor and employer (IDI)

*"Specific PPEs we use as sliding door technicians include the use of lens/glasses: this protects the eye. There is also the need for safety boots to protect the feet, there is the need for protective clothing. A drilling machine can easily pierce through the skin: this makes a firm protective clothing handy, providing a first layer of protection for the skin. Helmets are important in shielding the head from falling objects such as cement blocks. These items are equally necessary in masonry work."*

- Respondents 4, male, aged 25 years, Mason (IDI)

Most respondents (12 out of 15) ranked safety as number one when asked of their topmost priority as far as what they needed to be productive at the workplace was concerned. This statement from one respondent (a supervisor) encapsulates the views shared by most respondents:

*"I will rank safety on top of all my priorities at the workplace. Without safety, a single injury can cancel the entire work meant for the day. In worse cases, there can be death. The losses are many; you will still have to pay the people you took to the site regardless of the incident."*

There were however, a few dissenting views (3 out of 15). Respondent 3, a 37 year old mason and a supervisor had this to say:

*"I will place safety at number ....(after a brief pause to think) 4 on my priority list with my work. First on my list is having my materials to work, followed by hiring of workers to execute the*

*task..... Without acquiring these initial needs, there will be no work in the first place to think of safety."*

Some respondents described their workplace injury history and how it had shaped their approach to safety at the workplace. All but one of the respondents agreed that being injured at the workplace had heightened their safety precautions:

*"I once had an accident at Abuakwa-Manhya. I was standing on a two-storey building, whilst standing on a scaffold to receive a piece of block, I fell when the scaffold collapsed. I had an ankle sprain. On another occasion, I fell from a bench, landing on my waist, I was bed-ridden for 2 months. For 3 weeks, I could not obtain an erection..... These experiences have heightened my precautions when approaching any task."*

*"The minor injuries I've experienced have not changed my approach to work. If I do not come to work, it is either due to tiredness or sickness."*

-Respondent 9: 27 year old welder.

### **3.5 Practices of artisans in relation to occupational health and safety**

This section of the study established a wide range of factors related to OHS injury, illnesses and diseases. These factors highly contributed to the level of practice of OHS principles for both the employees and employers. In this case employers' OHS practice was determined through observation of basic OHS principles which require their hand if they are to be practiced by their employees. Most artisans (13 out of 15) representing 86.7% had suffered an injury which was minor in nature requiring only first aid or minor treatment. They expressed several actions they took to remain safe at their workplace. These include the use of personal protective equipment (PPE) like as helmets and safety boots. They also discussed the need of working in a coordinated way in order to prevent injuries that may have been caused by a lack of coordination. Others discussed the importance of maintaining a safe and clean home by doing tasks such as sweeping and washing the floors. The quotes below capture their views:

*"To improve safety, there must be self-awareness and utilization of safety tools or personal protective equipment. A tiler must alert an electrician when he identifies any electrical fault.*

*Specific safety equipment mostly used (though not all are used) include helmet, gloves, goggles, ear pin(plug), reflectors on clothing, firm fabric trousers, and safety boots.*

*These protective equipment are very essential. It limits my exposure to injury and improves productivity. I have encountered several injuries at the workplace before. At a construction site, I witnessed an incident where a construction worker dropped an object from a height, which landed on a colleague's head, killing him instantly (after an altercation)*

*The precautions I stress on to minimize risk of injury at the workplace includes heightened awareness. Also I advise against recklessness. I ensure that wet floors are mopped without delay to avoid slips and falls.*

*The rules pertaining to safety at my workplace include the precautions I've listed above. I see to their enforcement. In my absence, my chief apprentice takes charge".*

- Respondent 1, male, aged 35 years, Tiler/supervisor (IDI)

Other respondents also shared how they practiced safety at within their respective professions:

*"Safety can be improved at the workplace if supervisors show much commitment and regular prompting of apprentices. Apprentices must be reminded of the dire consequences of workplace injuries. There must not be undue pressure on workers to meet task deadlines. This can lead to injuries.*

*Equipment for safety includes safety harness. As carpenters, we strap on it whilst climbing heights. We also ensure effective housekeeping at the workplace. Other safety equipment we use includes use of scaffolds, reflectors, helmets, safety boots, goggles, ear plugs, nose covers. All these tools are relevant. Use of hammer prevents injury to the hand, the use of reflectors on clothing promote*

*better identification at night by other people such as drivers whose light throws on the person. The use of personal protective equipment provides confidence and an air of safety for workers as they undertake their tasks”.*

- Respondent 2, aged 42 years, male, Carpenter (IDI)

*“Precautions to minimize the risk of injury at the workplace include acting as each other’s keeper. If a colleague ignores safety rules, and ignores prompting from a colleague, he must be reported to the supervisor.... (Bell rings in the background). Some people do not care about the safety of their colleagues. This is a bad principle and it must be discouraged.”*

-Respondent 7: 23 year old mechanic

Respondent 3, a 37 year old mason supervisor touched on what he does to keep his workplace safe:

*“Being engrossed with lots of thoughts whilst at work can cause errors, which can lead to injuries. There is the need for full concentration. Hunger and thirst can be distractions whilst working. We encourage workers to eat before starting their shift. Use of alcohol at the workplace is prohibited.”*

### **3.6 Occupational health and safety issues among Artisans**

The need to know the measures put in place by the artisans to reduce or prevent accidents and injuries in the course of their work was important in this study. This is because workers in informal small-scale enterprises can only be assured of their daily wages and incomes when they work in a safe and healthy workplace. When accidents occur, various things result from it: damage to property, injuries to people, loss of time, and reduced productivity. Workplace injuries and diseases are of concern because they impose costs not only on injured workers and their employers. Some of these injuries include trips, falls and cuts from tools with sharp ends.

Most of the respondents (11 out of 15) representing 73.3% indicated that, the major issue that was of concern to them was that of the emergency services at their disposal in time of need. Others further stated that, even though they had been trained by these emergency service providers (Fire service department and the National Ambulance Service), they did not have their contacts to call in case there is an emergency. Most of the respondents (12 out of 15) (80%) however, did not know of emergency contact information in times of injury and fire outbreak. The approach to reaching emergency services had to go through the long route of either contacting their employers or an acquaintance who may have the contact number for the emergency services. This was apparent in the account from respondent 9, a 27 year old welder and steel bender when asked if he knew of the contact number for emergency services such as the fire service and the national ambulance service:

*“I do not know the contact number of the fire service department off the top of my head..... That’s a serious question. The truth is... I haven’t been... I haven’t really, to be honest, I’ve never, I mean thought of that myself...But....ok I will contact them through police. I have a friend who is a police officer”*

*“Our supervisor once briefly touched on first aid principles during one of our morning safety training sessions. Currently we do not know of the emergency number for the national ambulance service. Its unfortunately I do not remember the number for fire service department off hand....(Chuckles)”*

-Respondent 5, aged 23 years, male, Mechanic (IDI)

Another issue was how the use of the PPEs interferes with the speed of their daily activities. Some respondents narrated their side of such a disturbing issue:

*“Generally, the use of PPEs is not convenient. Notwithstanding, they are very necessary and hence must be used because of their safety benefits. In some regards, it slows down the speed of work. For instance whilst cutting an object, and the goggle lens is dirty (impeding visibility), one may want to take it off to get a clearer view, though such an act can expose the eyes to falling particles Among the PPEs, the ones I use least are gloves. For instance when I’m plastering, the trowel becomes slippery and handling it with gloves makes it become inconvenient”. (Such situations sometimes create ambivalence for the worker).*



- Respondent 6, aged 21 years, male, Mechanic (IDI)

Another issue at the work place concerning OHS was that most of the artisans did not possess any form of health insurance. One employer described the situation at his workshop:

*“Unfortunately not all my apprentices have registered with the national health insurance scheme. It is something I’m working on. Recently, one of my apprentices had to access healthcare and he was not insured. It got me worried. Workplace injuries are rare at my workshop, if an apprentice gets injured, most of the time, they sustain it out there whilst playing football or indulging in another activity”.*

- Respondent 8, aged 36 years, male, Welder (IDI)

The occupational status of the respondents and the type of trade respondents are engaged in affected their practice and knowledge on OHS. A descriptive analysis was performed on respondents’ occupational status. Generally, there were three occupational classes of artisans identified at Bibiani cluster, namely, master artisans, work-and-pay artisans and apprentices. Master artisans are individuals or artisans of consummate skills and direct the work of others particularly the “work-and-pay” artisans and apprentices. Master artisans, by their characteristic, are known to own or have set up their enterprises to engage in a specific trade, manage the enterprise and train apprentices. Master artisans are also employers who engage others such as work-and-pay artisans to work for them. The master artisans represent the enterprise at meetings organized by the worker associations and the District Assemblies. Work-and-pay artisans are artisans hired/employed by master artisans to help in the day-to-day activities of the enterprise and receive wages/salaries on either daily, weekly, or monthly bases. Work-and-pay artisans are generally master craftsmen who have not been able to start-up their own shops due to financial or other challenges. Apprentices, on the other hand, are those who work for the master craftsmen and the work-and-pay artisans to learn a trade of their choice. It was found that apprentices learning any form of trade are not given wages or salaries but are paid daily stipends referred to as “chop money” by their masters. In terms of ranking at a workshop, the master artisan comes first, followed by the work and-pay artisan and lastly the apprentice.

#### 4. DISCUSSION

The occupational status of the respondents and the type of trade respondents are engaged in affected their practice and knowledge on OHS. Generally, there were three occupational classes of artisans identified at Bibiani cluster, namely, master artisans, work-and-pay artisans and apprentices. The master artisans per their duties discharged always gives orders to the apprentices and the work-and-pay artisans. Hence, this work force from the master artisan affected the OHS practices at the work place. It was observed that, due to the fact that the apprentices and the work-and-pay artisans follow others, they are likely to observe the safety protocols at the work as compared to the master artisan. On the other hand, the master artisans practice the safety protocols to serve as an illustration to the apprentices and the work-and-pay artisans. The main artisans that were captured in these current studies at the Bibiani Municipality were the mechanics, carpenters, welders, masons and the tillers. Organizational factors were presumed to influence the workplace safety the artisans received on OHS practices. According to Fugas et al., (2012), there is a relationship between organizational factors and worker safety behavior such as action taken to ensure safety at the workplace. It has also been suggested by Esterhuyzen (2019), that safety culture of an organization influences workers’ behavior which can lead to injuries or accidents. Factors within the organization considered were; safety as a priority in the workshop and the presence of well-established safety culture. Safety culture was adopted because Effah Antwi et al., (2013) argued that safety culture is important because it forms the setting within which ones’ safety attitudes develop and persist while others argue that, safety culture influences employees’ attitudes and behavior towards an organization’s health and safety measures. Among the artisans interviewed, there were no well-structured organizational health and safety factors established at the workplace.

Educational level of respondents was recorded based on the level completed. Few of the respondents (22.2%) indicated that they completed basic education (junior high school/middle school) followed by 77.7% who completed senior high school. As part of the profile, the respondents were asked to state the number of years they had worked as artisans. The level of education of the respondents did not appear to influence their knowledge on occupational health and safety as some less educated respondents were able to describe

occupational health and safety in more detail than their more educated counterparts and vice versa. It emerged that 55.5% of the respondents had worked as artisans at the enclave between 1 and 5 years while 11.1% had worked as artisans for 6 to 10 years. Finally, 33.3% had work for 10 years and more. Many differences were not found in the number of years respondents had worked as artisans in terms of the type of artisanal trade engaged in. For instance, 33.3% of auto-body workers, 11.1% of carpentry works. 22.2% of welders and mason and 11.1% of tillers had worked between 1 and 10 years as compared to master artisans (33.3%). No direct relationship between work experience and attitude to OHS was discovered. However, artisans in senior positions such as supervisors and employers displayed more positive attitudes towards safety since they held answerable positions in case there were any incidents of workplace injuries.

The responses of the respondents in this current study highlighted that their knowledge on occupational health and safety at the work place as artisans were adequate. The findings of this study on the knowledge of the artisans been adequate is in congruence with a study conducted by Nibelo and Manu, (2020) that, most of the respondents agreed that PPE usage such as wearing of the prescribed attire for the workshop, use of strong workshop attire and shoes were enough to give them some amount of safety. In addition, most respondents agreed that PPEs are used to prevent specific body parts from being exposed to hazards.

More so, the study found that, training sessions organized and attended updated their knowledge on housekeeping and health and safety at the work place, hence their adequacy in the knowledge level regarding occupational health and safety. Apreko et al., (2015) reported that, a clean and tidy workplace environment is essential to ensure the health and safety of the workers at workplaces. Most respondents agreed that spacious environment, clear and accessible exit, adequate lighting, well ventilated environment, clean environment and slip free environment were very important factors to reduce accidents at local garages. This was obtained during a workshop organized for automotive garages in Ghana. Knowledge of artisans on occupational hazards largely centered on physical and chemical hazards within their working area which are the imminent causes of most of their workplace injuries. No respondent made mention of biological or ergonomic hazards. It underscores the orientation of the respondents on the concept of occupational health and safety: most of them viewed it from the lens of prevention from injury and touched less on other aspects of ill-health such as respiratory conditions from inhaling fumes, waist pains from poor lifting techniques and damage to hearing from exposure to excessive noise. The age of respondents did not appear to have any bearing on their knowledge of occupational health and safety. On the contrary to a study conducted in rural communities in Edo state, Nigeria (Osayande et al., 2019) that, workers who fell within the ages of 20 to 29 had inadequate knowledge on how to protect themselves at a quarry site. This finding is at variance with these current study findings in Bibiani among artisans. Knowledge on the use of PPEs and hazard identification were satisfactory. The main area where most respondents had limited insight had to do with the handling of medical and fire emergencies. Most respondents did not know of these emergency contact numbers.

The vast majority of respondents received their knowledge on occupational health and safety either from the mainstream media or from their colleagues. The majority of the training arrangements for responses at the other sites were haphazard, with the exception of one workshop that had a well-structured safety training regimen for its workers. This workshop was the only one of the locations. Another observation was the possible link between an employer's knowledge and attitude on safety and its effect on his employees. Among the respondents, those that exhibited the highest level of knowledge on occupational health and safety all belonged to one mechanic workshop where their supervisor had formal training in safety. This reflected in the presence of a well-structured safety training program at this workshop which took place three times in a week.

As already alluded to early on, positive attitude towards occupational health and safety principles is a positive ingredient in the achievement of workplace safety. The responses from the participants illustrated that, they had a positive attitude with regards to OHS. This study findings agree with a study conducted by Simukonda, (2019) that, when people are working in situations that suit their physical and mental abilities, the correct fit between the person and the work task is accomplished. People are then in the optimum situation for learning, working and achieving, without adverse health consequences. All these were as a result of positive attitudes towards OHS by the artisans. On the contrary, a study conducted by Oranusi et al., (2014) in Malawi on the practice of OHS by building contractors found out that, most of the contractors even though had received training, did not practice OHS at their work places, and this posed to them a higher risk at their daily activities at the working site.

The influence of previous injuries in guiding safety attitudes appeared mixed. Whereas some respondents admitted that their previous encounters with injuries and absence at the workplace had made them approach their work in a safer manner than before, others were of the view that it had no bearing on their approach to tasks. This raises concerns about the impact of knowledge they have acquired because the object of learning be it structural or experiential is to change the way people perceive and behave. The majority of respondents ranked health and safety at the top of their priority lists as far as being productive at the workplace was concerned. They affirmed that without safety, they would not be alive or fit enough to carry out their tasks. This disposition, however, did not necessarily translate to safe attitudes at all times. This is because all the workplace injuries sustained by the respondents occurred at times when they were not fully clad in their appropriate PPEs. This underscores the need to maintain a positive attitude to safety at all times, and not some of the times.

From the experiences shared by participants on the use of PPEs in working condition, the practice of occupational health and safety on the average was quite encouraging. Their knowledge on specific PPEs and their functions were adequate and reflected in their actions as observed at their workplace. This is consistent with findings by (Rantanen & Lehtinen, 2012) where 86% of respondents (welders) used protective glasses. All respondents used at least one PPE at their workplace. The findings of this study were in contrast with a study conducted among quarry workers at Ife-Ife in Nigeria where only a third (34%) of the respondents used a PPE (face mask) in spite of them having expressed knowledge on the use in importance of PPEs (Aigbokhaode et al., 2011). This could be as a result of the unskilled nature of the job and the operating system in the quarry which involves subcontracting of the quarries to operators whose major interest would be to maximize profit and so they would not bother to train or educate the workers of the dangers associated with working in such exposed site.

One curious observation was that almost all participants mentioned one or two personal protective equipment that they do not use most often. Most of their reasons bothered on inconveniences associated with usage of that particular PPE. Some would not use gloves because it appeared clumsy when they are engaged in fine motor activities such as tightening of screws. Others explained that they did not like to use face masks because it muffled their sounds thereby impeding smooth communication. Notwithstanding these concerns, they all agreed that PPEs are useful. These seeming disconnect between knowledge and practice was pervasive among the respondents. It brings to the fore the need for an enforcement regime on the wearing of PPEs so that it would not be left at the discretion or convenience of the artisans. It was also observed that most of the accidents that the respondents recounted occurred outside their normal place of work. Artisans per the nature of their work tend to be itinerant. Once they are called to render services at a distant location, there is the potential of leaving some of their safety accoutrement behind for the sake of convenience in mobility.

The hazardous nature of an artisan's work call for optimal knowledge and preparedness in times of an emergency. Areas of concern centered on knowledge of first aid, how to contact emergency services such as the national ambulance and fire services, and how to handle the fire extinguisher when there is a fire outbreak. The artisans had not received any training on the administration of first aid. Only a few respondents could mention the contact numbers of either the national ambulance service or the fire service department. Demonstration of the use of fire extinguishers was a struggle for many, except the staff of one workshop, where the trainees had been taken through series of fire drills.

The need to know the measures put in place by the artisans to reduce or prevent accidents and injuries in the course of their work was important in this study. This is because workers in informal small-scale enterprises can only be assured of their daily wages and incomes when they work in a safe and healthy workplace. When accidents occur, various things result from it: damage to property, injuries to people, loss of time, and reduced productivity. Workplace injuries and diseases are of concern because they impose costs not only on injured workers and their employers, but also on the larger interconnected support systems. The artisans indicated that they faced direct financial problems as a result of the accidents and injuries they sustain at work. Also unavailability of insurance packages (mostly among employees) was an OHS issue which was a major concern to most of the employers. This was in congruence with a study conducted by Onowhakpor et al., (2017) in Lagos, Nigeria. In his study, he found that, there were inadequate knowledge and enrolment options, and procedures involved in the insurance scheme and documented to be barriers why many informal sector workers such as artisans have not been enrolling in the insurance scheme. Ghana has a health insurance scheme that is affordable and covers all primary health care needs and most secondary health care needs.

However, not all respondents had enrolled, and their employers had not checked the insurance status of their workers. This is in contrast to another study, which reported a higher level of awareness among artisans on assurance packages and its utilization (Campbell et al., 2016).

## 5. CONCLUSION

This study identified and documented the key issues affecting occupational health and safety among artisans in the informal sector in Bibiani. Precisely, it determined the knowledge of artisans on occupational health and safety, the attitudes of artisans towards occupational health and safety, the practices of artisans in relation to occupational health and safety in Bibiani and finally, the study determined the key occupational health and safety issues among artisans at Bibiani. The study revealed that the majority of workers understand the need for PPE and want to be protected against accident, injury and illness. However, there is a need to address the issues of availability, comfort and education with respect to PPE usage to ensure that the equipment is properly used to protect the artisans. Proper maintenance and replacement of PPE would also go a long way in improving the practices of PPE use in automotive workshops in Ghana. Policies and regulations with respect to PPE need to be developed and implemented. Finally, the study also identified that, most artisan lacked insurance packages and emergency contact numbers of the emergency services, case the need arises for an emergency rescue. Other literatures found similar findings of the current study with regard to knowledge level, attitude towards OHS, practice and other issues regarding OHS. Although most artisans exhibited sufficient knowledge and positive attitude towards occupational health and safety, they did not necessarily practice all that they knew owing to absence of an enforcement regime for occupational health and safety at the local level, differences in workplace safety rules, personal orientations, and a general sense of wanting to forego processes that they deemed inconvenient.

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## REFERENCES

- Aboagye, D., Adu-Prah, S., & Ansah, C. E. (2018). Assessing social vulnerability to fire hazards at the kumasi central market, Ghana. *International Journal of Applied Geospatial Research*. Provide volume and page range <https://doi.org/10.4018/IJAGR.2018100104>
- Adebola, J. O. (2014). Knowledge, Attitude and Compliance with Occupational Health and Safety Practices among Pipeline Products and Marketing Company (PPMC) Staff in Lagos. *Merit Research Journal of Medicine and Medical Sciences*. Provide volume and age range
- Adei, E., & Adei, D. (2011). *ASSESSMENT OF PERCEPTION AND KNOWLEDGE OF OCCUPATIONAL CHEMICAL HARZARDS, IN THE KUMASI METROPOLITAN SPRAY PAINTING INDUSTRY, GHANA*. 31(2), 83–94. Use lower case letters for the title of the paper
- Ahmad, Iftikhar, Qadir, S., Muhammad, Yasir, M., Irfanullah, M., Khan, M. A., ... Waqas, M. (2012). Knowledge, attitude and practice related to occupational health and safety among textile mills workers in Dera Ismail Khan. *Gomal Journal of Medical Sciences*, 10 (2), 222–226.
- Ahmad, Ijaz, Balkhyour, M. A., Abokhashabah, T. M., & Ismail, I. M. (2018). Assessment of Personal Protective Equipment use and Occupational Exposures in Small Industry in Jeddah : Health Implications for Workers Assessment of Personal Protective Equipment use and Occupational Exposures in Small Industry in Jeddah : Health Implic. *Saudi Journal of Biological Sciences*, (November). <https://doi.org/10.1016/j.sjbs.2018.06.011>
- Ahmed, H. O., & Newson-Smith, M. S. (2010). Knowledge and practices related to occupational hazards among cement workers in United arab emirates. *The Journal of the Egyptian Public Health Association*. Provide volume, number and page range
- Ahmed, J., Malik, F., Arif, T. Bin, Majid, Z., Chaudhary, M. A., Ahmad, J., Khalid, M. (2020). Availability of Personal Protective Equipment ( PPE ) Among US and Pakistani *Doctors in COVID-19 Pandemic Study design and*



*duration*. 12 (6). <https://doi.org/10.7759/cureus.8550> What journal is this?

- Ahmed, S., & Waqas, H. (2017). OCCUPATIONAL INJURIES AND EMPLOYEES TURNOVER INTENTION : A MODERATING EFFECT OF SAFETY CULTURE. *Monash Business Review*, Provide volume, number and page range. Use lower case letters for the title.
- Aigbokhaode, A., Ec, I., & Ar, I. (2011). Knowledge And Practice of Occupational Safety Among Quarry Workers in A Rural Community in Edo State. *Journal of Community Medicine and Primary Health Care*, 23, 16–24.
- Akuoko, K. O., Yeboah, M. K., Kanwetuu, V. D. P., & Kwankye, E. A. (2013). Worker Characteristics and Compliance to Occupational Health and Safety of Wood Workers in Naja David Wood Industry Limited in Kumasi, Ghana. *International Journal of Research in Commerce and Management*. Provide vol, number and page range
- Aljazeera. (2017). Ghana: Gas depot blasts kill at least seven in Accra | Ghana News | Al Jazeera. Retrieved December 14, 2020, from <https://www.aljazeera.com/news/2017/10/8/ghana-gas-depot-blasts-kill-at-least-seven-in-accra>
- Amfo-Otu, R., & Agyemang, J. K. (2016). Occupational health hazards and safety practices among the informal sector Auto Mechanics. *Applied Research Journal*. Provide vol, number and page range
- Amponsah-Tawiah, K., & Dartey-Baah, K. (2011). Occupational health and safety: Key issues and concerns in Ghana. *International Journal of Business and Social Science*. Provide vol, number and page range
- Annan, J. S., Addai, E. K. & Tulashie, S. K. (2015). A Call for action to improve occupational health and safety in Ghana and a critical look at the existing legal requirement and legislation. *Safety and Health at Work*, 6 (2). <https://doi.org/10.1016/j.shaw.2014.12.002>
- PLEASE SEE THE ABOVE CORRECTIONS AND DO SAME FOR THE REMAINING REFERENCES
- Apenteng, J. A., & Asare, C. O. (2016). the Risk of Pulmonary Disease and Other Health Hazards Among Small Scale Stone Quarry Workers : a Study At Miotso in the Ningo - Prampram District of Ghana the Risk of Pulmonary Disease and Other Health Hazards Among Small Scale Stone Quarry Workers : a S. *International Journal of Development Research*, 6(October), 9739–9747.
- Apreko, A. A., Danku, L. S., & Akple, M. S. (2015). Occupational Health and Safety Management: Safe work environment in the local Automotive Garage in Ghana. *International Journal of Academic Research in Business and Social Sciences*, 5(2), 226–229. <https://doi.org/10.6007/ijarbss/v5-i2/1479>
- Apreko, A. A., Danku, L. S., Selase, M., Adokou, A., & Apeletey, F. (2015). *Occupational Health and Safety Management : The Use of Personal Protective Equipment ( Ppe ) by Artisans in The Local Automotive Industry in Volta International Journal of Engineering Trends and Technology ( IJETT ) – Volume 19 Number 4 – Jan 2015 Occupat.* (January). <https://doi.org/10.14445/22315381/IJETT-V19P236>
- Asare, T. O., Ibrahim, A. F., & Nyarko, M. O. (2019). Occupational health and safety status of workers in the garment industry in ghana. *Fashion and Technology Review*, 1(1), 37–50.
- Asibey, M. O., Amponsah, O., & Yeboah, V. (2019). Solid waste management in informal urban neighbourhoods. Occupational safety and health practices among tricycle operators in Kumasi, Ghana. *International Journal of Environmental Health Research*, 29(6), 702–717. <https://doi.org/10.1080/09603123.2019.1569211>
- Badri, A., Boudreau-Trudel, B., & Souissi, A. S. (2018). Occupational health and safety in the industry 4.0 era: A cause for major concern? *Safety Science*. <https://doi.org/10.1016/j.ssci.2018.06.012>
- Banan, G. J., S, S. B., & Che Shaari, S. (2019). Mediating Effects of Workers' Attitude on Relationship Between OSHMS and OSH Culture: Construction Industry in Sarawak. In *MJBE* (Vol. 6). Retrieved from Online website: [www.dosh.gov.my](http://www.dosh.gov.my)
- Boston, C., Kurup, R., & Zaman, S. (2020). Perception of Sawmill Workers towards Occupational Health and Safety at Linden/Soesdyke Highway, Guyana. *Asian Journal of Advanced Research and Reports*, 9(1), 14–22.



<https://doi.org/10.9734/ajarr/2020/v9i130211>

- Boyes, W. K., Thornton, B. L. M., Al-abed, S. R., & Christian, P. (2017). environmental health and safety implications of engineered nanomaterials. *Critical Reviews in Toxicology*, 0(0), 1–44. <https://doi.org/10.1080/10408444.2017.1328400>
- Burns, K. N., Saylor, S. K., & Neitzel, R. L. (2019). Stress, health, noise exposures, and injuries among electronic waste recycling workers in Ghana. *Journal of Occupational Medicine and Toxicology*. <https://doi.org/10.1186/s12995-018-0222-9>
- Campbell, P. C., Owoka, O. M., & Odugbemi, T. O. (2016). *National health insurance scheme : Are the artisans benefitting in Lagos state , Nigeria ?* <https://doi.org/10.4103/2468-6859.185249>
- Chambers, T. (2013). *Phenomenological Research | Qualitative Research in Corporate Communication*. 135–136. Retrieved from <https://blogs.baruch.cuny.edu/com9640epstein/?p=543>
- Cheng, C. W., Leu, S. Sen, Lin, C. C., & Fan, C. (2010). Characteristic analysis of occupational accidents at small construction enterprises. *Safety Science*. <https://doi.org/10.1016/j.ssci.2010.02.001>
- Chib, S., & Kanetkar, M. (2014). Safety Culture: The Buzzword to Ensure Occupational Safety and Health. *Procedia Economics and Finance*. [https://doi.org/10.1016/s2212-5671\(14\)00183-x](https://doi.org/10.1016/s2212-5671(14)00183-x)
- Clarke, S. (2010). An integrative model of safety climate: Linking psychological climate and work attitudes to individual safety outcomes using meta-analysis. *Journal of Occupational and Organizational Psychology*. <https://doi.org/10.1348/096317909X452122>
- Coggins, M. A., Van Lente, E., McCallig, M., Paddan, G., & Moore, K. (2010). Evaluation of hand-arm and whole-body vibrations in construction and property management. *Annals of Occupational Hygiene*. <https://doi.org/10.1093/annhyg/meq064>
- Danso, F. O. (2010). Occupational Health and Safety Issues Involving Casual Workers on Building Construction Sites in Ghana, a Kumasi Study. *KNUSTSpace, Unpublishe*(July), 1–133. Retrieved from <http://hdl.handle.net/123456789/488>
- Darko, S. (2015). Ghana petrol station inferno kills about 150 in Accra - BBC News. Retrieved January 19, 2020, from BBC website: <https://www.bbc.com/news/world-africa-33003673>
- Dickson, Idungafa, E., & Tobin-West, C. (2019). Socio Demographic Factors Associated with Knowledge of Occupational Hazard and Safety Measures among Workers in Selected Downstream Petroleum Companies in Port Harcourt, Rivers State, Nigeria. *Journal of Advances in Medicine and Medical Research*, 29(11), 1–12. <https://doi.org/10.9734/jammr/2019/v29i1130140>
- Diwe, K. C., Duru, C. B., Iwu, A. C., Merenu, I. A., Uwakwe, K. A., Oluoha, U. R., & Ogunniyan, T. B. (2016). Occupational Hazards , Safety and Hygienic Practices among Timber Workers in a South Eastern State , Nigeria. *Occupational Diseases and Environmental Medicine*, (August), 63–71.
- Effah, B., Antwi, K., Adu, G., & Boampong, E. (2013a). The Safety Culture of Artisans at the Sokoban Wood Village Enclave, Ghana. *American International Journal of Contemporary Research*, 3(12), 121–128.
- Effah, B., Antwi, K., Adu, G., & Boampong, E. (2013b). The Safety Culture of Artisans at the Sokoban Wood Village Enclave, Ghana. *American International Journal of Contemporary Research*, 3(12).
- Esaiyas, A., Sanbata, H., & Mekonnen, Y. (2018). Occupational Health and Safety Related Knowledge, Attitude and Practice among Wood and Metal Workers in Hawassa, Ethiopia. *Annual Research & Review in Biology*, 22(6), 1–9. <https://doi.org/10.9734/arrb/2018/38958>
- Esterhuyzen, E. (2019). Small business barriers to occupational health and safety compliance. *The Southern African Journal of Entrepreneurship and Small Business Management*, 11(1), 1–8. <https://doi.org/10.4102/sajesbm.v11i1.233>
- Faremi, F., Ogunfowokan, A., Mbada, C., Olatubi, M., & Ogungbemi, A. (2014). Occupational hazard awareness and safety practices among Nigerian sawmill workers. *International Journal of Medical Science and Public*

Health. <https://doi.org/10.5455/ijmsph.2014.260620142>

- Fugas, C. S., Silva, S. A., & Meliá, J. L. (2012). Another look at safety climate and safety behavior: Deepening the cognitive and social mediator mechanisms. *Accident Analysis and Prevention*. <https://doi.org/10.1016/j.aap.2011.08.013>
- Garcia, G. M., & De Castro, B. (2017). Working Conditions, Occupational Injuries, and Health among Filipino Fish Processing Workers in Dutch Harbor, Alaska. *Workplace Health and Safety*, 65(5), 219–226. <https://doi.org/10.1177/2165079916665396>
- Ghana Districts. (2019). Ghana Districts: A repository of all Local Assemblies in Ghana. Retrieved February 17, 2020, from <http://www.ghanadistricts.com/Home/LinkData/7188> website: <http://www.ghanadistricts.com/Home/District/202>
- Ghasemi, Z., & Mehdad, A. (2018). Comparison of personality characteristics and attitude towards safety among injured and non-injured workers. *Iran Occupational Health*, 14(6), 47–56.
- Guerin, R. J., & Toland, M. D. (2020). An application of a modified theory of planned behavior model to investigate adolescents' job safety knowledge, norms, attitude and intention to enact workplace safety and health skills. *Journal of Safety Research*, 72, 189–198. <https://doi.org/10.1016/j.jsr.2019.12.002>
- Hassan, S. M., Nasir, U., Anwar, K., & Talib, U. (2018). An assessment of the level of awareness and reported complaints regarding occupational health hazards and the utilization of personal protective equipments among the welders of. *International Journal of Occupational and Environmental Health*, 3525, 1–12. <https://doi.org/10.1080/10773525.2018.1426259>
- Howard, J., & Hearl, F. (2012). Occupational safety and health in the USA: Now and the future. *Industrial Health*, 50(2), 80–83. <https://doi.org/10.2486/indhealth.MS1356>
- Ifelebuegu, A. O., Martins, O. A., Theophilus, S. C., & Arewa, A. O. (2019). The Role of Emotional Intelligence Factors in Workers' Occupational Health and Safety Performance—A Case Study of the Petroleum Industry. *Safety*, 5(2), 30. <https://doi.org/10.3390/safety5020030>
- Islam, R., Hossain, M. S., & Siddique, M. A. B. (2017). Occupational health hazards and safety practices among the workers of tannery industry in Bangladesh. *Jahangirnagar University Journal of Biological Sciences*. <https://doi.org/10.3329/jujbs.v6i1.33727>
- ISO - International Organization for Standardization. (2017). ISO 45001 - Occupational health and safety. *Official Website*.
- Ivan, I. (2013). Workers' Health Situation. Retrieved December 27, 2020, from Health in the Americas website: <https://www.paho.org/salud-en-las-americas-2017/?p=1707>
- Izudi, J., Ninsiima, V., & Alege, J. B. (2017). Use of Personal Protective Equipment among Building Construction Workers in Kampala, Uganda. *Journal of Environmental and Public Health*, 2017(November 2015).
- Jasani, P., Joshi, J., Kartha, G., Mehta, H., & Shah, I. (2016). A study of knowledge and utilization of safety measures against occupational hazards among constructional workers in Surendranagar city, Gujarat, India. *International Journal of Community Medicine and Public Health*, 3055–3058. <https://doi.org/10.18203/2394-6040.ijcmph20163910>
- Johnson, O. E., & Motilewa, O. (2016). *Knowledge and Use of Personal Protective Equipment among Auto Technicians in Uyo, Nigeria*. (January). <https://doi.org/10.9734/BJESBS/2016/24546>
- Jørgensen, K. (2016). Prevention of “simple accidents at work” with major consequences. *Safety Science*, 81. <https://doi.org/10.1016/j.ssci.2015.01.017>
- Kao, K. Y., Spitzmueller, C., Cigularov, K., & Thomas, C. L. (2019). Linking safety knowledge to safety behaviours: a moderated mediation of supervisor and worker safety attitudes. *European Journal of Work and Organizational Psychology*, 28(2), 206–220. <https://doi.org/10.1080/1359432X.2019.1567492>
- Kasaeinasab, A. A. (2016). *c r v i h o e f c r v i h o e f*. *Health Sci Surveillance Sys*.

- Katsuro, P., Gadzirayi, C. T., Taruwona, M., & Mupararano, S. (2010). Impact of occupational health and safety on worker productivity: A case of Zimbabwe food industry. *African Journal of Business Management*, 4(13), 2644–2651.
- Kearney, G. D., Rodriguez, G., Quandt, S. A., Arcury, J. T., & Arcury, T. A. (2015). Work safety climate, safety behaviors, and occupational injuries of youth farmworkers in North Carolina. *American Journal of Public Health*. <https://doi.org/10.2105/AJPH.2014.302519>
- Khan, M. W., Ali, Y., De Felice, F., & Petrillo, A. (2019). Occupational health and safety in construction industry in Pakistan using modified-SIRA method. *Safety Science*, 118, 109–118. <https://doi.org/10.1016/j.ssci.2019.05.001>
- Kumar, G., Dharanipriya, A., & Kar, S. (2013). Original Article. *Int J Occup Environ Med*, 4(4), 172–177.
- Kwame, O.-B., Kusi, E., & Lawer, E. A. (2014). Occupational Hazards And Safety Practices: A Concern Among Small Scale Sawmilling Industries In Tamale Metropolis, Ghana. *Undefined*, 3(10), 234–236.
- Laberge, M., MacEachen, E., & Calvet, B. (2014). Why are occupational health and safety training approaches not effective? Understanding young worker learning processes using an ergonomic lens. *Safety Science*. <https://doi.org/10.1016/j.ssci.2014.04.012>
- Le, S., Bazger, W., Hill, A. R., & Wilcock, A. (2014). Awareness and perceptions of food safety of artisan cheese makers in Southwestern Ontario: A qualitative study. *Food Control*. <https://doi.org/10.1016/j.foodcont.2014.01.007>
- Lim, M. S. C., Murray, J., Dowdeswell, R. J., Glynn, J. R., & Sonnenberg, P. (2011). Unnatural deaths in South African platinum miners, 1992-2008. *PLoS ONE*. <https://doi.org/10.1371/journal.pone.0022807>
- Loosemore, M., & Malouf, N. (2019). Safety training and positive safety attitude formation in the Australian construction industry. *Safety Science*, 113, 233–243. <https://doi.org/10.1016/j.ssci.2018.11.029>
- Lucchini, R. G., & London, L. (2014). Global occupational health: Current challenges and the need for urgent action. *Annals of Global Health*, 80(4), 251–256. <https://doi.org/10.1016/j.aogh.2014.09.006>
- Maceachen, E., Kosny, A., & Marcia, K. S. (2010). Workplace Health Understandings and Processes in Small Businesses : A Systematic Review of the Qualitative Literature Workplace Health Understandings and Processes in Small Businesses : A Systematic Review of the Qualitative Literature. *J Occup Rehabi*, 20(February), 180–198. <https://doi.org/10.1007/s10926-009-9227-7>
- Manu, P., Emuze, F., Saurin, T. A., Hadikusumo, B. H. W., Agumba, J. N., & Musonda, I. (2019). Occupational accidents predicting early retirement of construction workers in South Africa. In *Construction Health and Safety in Developing Countries*. <https://doi.org/10.1201/9780429455377-19>
- Marahatta, S. B., Gautam, S., Paudel, G., & Yadav, U. N. (2018). Awareness of occupational hazards and associated factors among automobile repair artisans in Kathmandu Metropolitan City, Nepal. *Indian Journal of Occupational and Environmental Medicine*. [https://doi.org/10.4103/ijoem.IJOEM\\_106\\_17](https://doi.org/10.4103/ijoem.IJOEM_106_17)
- Masekameni, M. D., Moyo, D., Khoza, N., & Chamdimba, C. (2020). Accessing occupational health services in the Southern African development community region. *International Journal of Environmental Research and Public Health*, 17(18), 1–11. <https://doi.org/10.3390/ijerph17186767>
- Maxwell, J. A., & Rebold, L. E. (2015). Qualitative Research. In *International Encyclopedia of the Social & Behavioral Sciences: Second Edition*. <https://doi.org/10.1016/B978-0-08-097086-8.10558-6>
- Men's Health, T. J. of. (2013). The Vienna declaration on the health of men and boys in Europe. *The Journal of Men's Health & Gender*, 2(4), 446–447. <https://doi.org/10.1016/j.jmhg.2005.10.004>
- Mohammadfam, I., Kamalinia, M., Momeni, M., Golmohammadi, R., Hamidi, Y., & Soltanian, A. (2017). Evaluation of the Quality of Occupational Health and Safety Management Systems Based on Key Performance Indicators in Certified Organizations. *Safety and Health at Work*. <https://doi.org/10.1016/j.shaw.2016.09.001>

- Mohd Kamar, I. F., Lop, N. S., Mat Salleh, N., Mamter, S., & Suhaimi, H. A. (2014). Contractor's Awareness on Occupational Safety and Health (OSH) Management Systems in Construction Industry. *E3S Web of Conferences*, 3, 0–5. <https://doi.org/10.1051/e3sconf/20140301019>
- Mojapelo, T. J., & Kok, L. (2017). Adherence to Occupational Health and Safety Standards : The Case of a South African Steel Processing Company. *African Journal of Governance and Development*, 6(1), 51–71.
- Monney, I., Bismark, D., & Isaac, O. (2014). Occupational health and safety practices among vehicle repair artisans in an urban area in Ghana. *Journal of Environmental and Occupational Science*, (October). <https://doi.org/10.5455/jeos.20140528072614>
- Motey, F. (2013). Investigation into Safety Practices by Automobile Mechanics at Siwdo Kokompe. *Industrial Engineering Letters*, 3(11), 1–17.
- Murray, C. J. L., & Lopez, A. D. (2013). Measuring the Global Burden of Disease. *The New England Journal of Medicine*. <https://doi.org/10.1056/NEJMra1201534>
- MUSTAPHA, Z., AIGBAVBOA, C., & THWALA, W. D. (2016). *OCCUPATIONAL HEALTH AND SAFETY CHALLENGES IN GHANA : THE WAY FORWARD*. (2007), 11–15.
- Muto, T., Mizoue, T., Araki, Y., Miyazaki, S., & Marui, E. (2002). HOW IS “ COVERAGE ” DEFINED FOR OCCUPATIONAL HEALTH SERVICES ? *International Journal of Occupational Medicine and Environmental Health*, 15(2), 147–154.
- Nana-otoo, A. (2016). *Occupational Health and Safety Issues in The informal Manufacturing Sector of Cape Coast Metropolis*. 1–167.
- Nasab, H. S., Ghofranipour, F., Kazemnejad, A., Khavanin, A., & Tavakoli, R. (2009). Evaluation of knowledge, attitude and behavior of workers towards occupational health and safety. *Iranian Journal of Public Health*.
- Ndejjo, R., Musinguzi, G., Yu, X., Buregyeya, E., Musoke, D., Wang, J., ... Ssempebwa, J. (2015). Occupational Health Hazards among Healthcare Workers in Kampala , Uganda. *Journal of Environmental and Public Health*, 2015. <https://doi.org/10.1155/2015/913741>
- Ndep, A. O., Okeke, J. E., Ekpenyong, B. N., & Osuchukwu, P. N. C. (2020). Using the Health Belief Model to Describe Factors Influencing Factory Workers ' Workplace Safety Practices in Nnewi , Anambra State , Nigeria. *International Journal of Innovative Science and Research Technology*, 5(1), 1222–1224.
- Nibelo, M., & Manu, E. (2020). Knowledge and Other Predictors of Child Welfare Clinic Completion among Children Aged 24 – 59 Months in the Garu-Tempene District of Northern Ghana : A Cross-Sectional Study of Caregivers. *Advances in Preventive Medicine*, 2020.
- Okafoagu, N. C., Oche, M., Awosan, K. J., Abdulmulmuni, H. B., Gana, G. J., Ango, J. T., & Raji, I. (2017). Determinants of knowledge and safety practices of occupational hazards of textile dye workers in sokoto, nigeria: A descriptive analytic study. *Journal of Public Health in Africa*. <https://doi.org/10.4081/jphia.2017.664>
- Okoffo, E. D., Mensah, M., & Fosu-Mensah, B. Y. (2016). Pesticides exposure and the use of personal protective equipment by cocoa farmers in Ghana. *Environmental Systems Research*. <https://doi.org/10.1186/s40068-016-0068-z>
- Oladipo, I.O & Fasasi, T. . (2013). EFFECT OF EIGHT-WEEK INTERVENTION PROGRAMME ON THE KNOWLEDGE, ATTITUDE AND UTILIZATION OF EYE PROTECTIVE DEVICES AMONG WELDERS IN IBADAN NORTH LOCAL GOVERNMENT AREA OF OYO STATE, NIGERIA. *Nigerian School Health Journal*, 25(1), 164–170.
- Oliveira, H. R. De, & Alchorne, A. D. O. D. A. (2011). Fundamentals of the knowledge about chemical additives present in rubber gloves. In *Anais brasileiros de dermatologia*. <https://doi.org/10.1111/j.1749-6632.2011.06077.x>
- Onowhakpor, A., Abusu, G., Adebayo, B., Esene, H., & Okojie, O. (2017). Determinants of occupational health and



- safety: knowledge, attitude, and safety practices toward occupational hazards of sawmill workers in Egor Local Government Area, Edo State. *African Journal of Medical and Health Sciences*, 16(1), 58. <https://doi.org/10.4103/2384-5589.209487>
- Onowhakpor, A. O., Abusu, G. O., Adebayo, B., Esene, H. A., & Okojie, O. H. (2017). Determinants of Occupational Health and Safety: Knowledge, Attitude, and Safety Practices Toward Occupational Hazards of Sawmill Workers in Egor Local Government Area, Edo State. *African Journal of Medical and Health Sciences*, 58–64. <https://doi.org/10.4103/2384-5589.209487>
- Oranusi, U. (2014). Assessment of Occupational Diseases among Artisans and Factory Workers in Ifo, Nigeria. *Journal of Scientific Research and Reports*, 3(2), 294–305. <https://doi.org/10.9734/jsrr/2014/5554>
- Oranusi, U. S., Dahunsi, S. O., & Idowu, S. A. (2014). *Assessment of Occupational Diseases among Artisans and Factory Workers in Ifo, Nigeria*. 3(2), 294–305.
- Organization, I. L. (2005). *Prevention : A global strategy*.
- Osagbemi, G.K; La-Kadri, R.T; Aderibigbe, S. . (2010). EBSCOhost | 53290958 | Awareness of Occupational Hazards, Health Problems and Safety Measures among Sawmill Workers in North Central Nigeria. Retrieved May 16, 2020, from <https://web.a.ebscohost.com/abstract?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=1303734X&AN=53290958&h=gUWU6dON0PfgFDMIO%2Fgs4ySrpYwHttTBnhxiGHZYvowatfGVKIS16zDGUxwaFxmRX3Iije3ioebMpXkg6B4DjQ%3D%3D&crl=c&resultNs=AdminWebAuth&resultLocal=E>
- Osayande, Festus, & Okolie, U. . (2019). (PDF) PERSON-JOB FIT AND EMPLOYEE ENGAGEMENT IN EDO STATE SECRETARIAT, BENIN CITY. Retrieved September 12, 2021, from Annals of Spiru Haret University of Economics Series website: [https://www.researchgate.net/publication/337979999\\_PERSON-JOB\\_FIT\\_AND\\_EMPLOYEE\\_ENGAGEMENT\\_IN\\_EDO\\_STATE\\_SECRETARIAT\\_BENIN\\_CITY](https://www.researchgate.net/publication/337979999_PERSON-JOB_FIT_AND_EMPLOYEE_ENGAGEMENT_IN_EDO_STATE_SECRETARIAT_BENIN_CITY)
- Patel, D. A., & Jha, K. N. (2016). An Estimate of Fatal Accidents in Indian Construction. In *Association of Researchers in Construction Management* (Vol. 1).
- Paul Abiodun, O. (2018). Assessment of the Knowledge, Attitudes and Perception of Potential Occupational Hazards by Automobile Workers in Makurdi, Benue State, Nigeria. *American Journal of Health Research*, 6(2), 37–43. <https://doi.org/10.11648/j.ajhr.20180602.11>
- Pilusa, M. L., & Mogotlane, M. S. (2018). Worker knowledge of occupational legislation and related health and safety benefits. *Curationis*, 41(1). <https://doi.org/10.4102/curationis.v41i1.1869>
- Ramdan, I. M., Candra, K. P., Arlita, D., & Tura, S. (2019). Association of demographic characteristics of construction workers and work environments to workplace accident in high building (hotel) construction. *Indian Journal of Public Health Research & Development*, 10(12), 1251–1256. <https://doi.org/10.37506/v10/i12/2019/ijphrd/192218>
- Rantanen, J., & Lehtinen, S. (2012). Occupational health services in selected International Commission on Occupational Health (ICON) member countries. *Scandinavian Journal of Work, Environment & Health*, (August). <https://doi.org/10.5271/sjweh.3317>
- Rantanen, J., Lehtinen, S., Valenti, A., & Iavicoli, S. (2017). A global survey on occupational health services in selected international commission on occupational health (ICOH) member countries. *BMC Public Health*, Vol. 17, pp. 2–11. <https://doi.org/10.1186/s12889-017-4800-z>
- Robson, L. S., Stephenson, C. M., Schulte, P. A., Amick, B. C., Irvin, E. L., Eggerth, D. E., ... Grubb, P. L. (2012). A systematic review of the effectiveness of occupational health and safety training. *Scandinavian Journal of Work, Environment and Health*. <https://doi.org/10.5271/sjweh.3259>
- Rupakheti, D., Singh Pradhan, P. M., & Basel, P. (2018). Occupational safety and health vulnerability among brick factory workers in Dhading district, Nepal. *Annals of Global Health*. <https://doi.org/10.29024/aogh.2313>
- Saracino, A., Antonioni, G., Spadoni, G., Guglielmi, D., Dottori, E., Flamigni, L., ... Pacini, V. (2015). Quantitative



- assessment of occupational safety and health: Application of a general methodology to an Italian multi-utility company. *Safety Science*. <https://doi.org/10.1016/j.ssci.2014.08.007>
- Sim, J., Saunders, B., Waterfield, J., & Kingstone, T. (2018). Can sample size in qualitative research be determined a priori? *International Journal of Social Research Methodology*, 21(5), 619–634. <https://doi.org/10.1080/13645579.2018.1454643>
- Simukonda, W. (2019). Occupational health and safety practices among contractors in Malawi: A generic overview. *Proceedings of Institution of Civil Engineers: Management, Procurement and Law*, 172(3), 118–124. <https://doi.org/10.1680/jmapl.18.00030>
- Siziya, S., Muula, A. S., Ryan, A., & Rudatsikira, E. (2010). Compensation patterns following occupational injuries in Zambia: Results from the 2009 labour survey. *International Archives of Medicine*. <https://doi.org/10.1186/1755-7682-3-19>
- Tadesse, T. (2006). *For Environmental and Occupational Health Students Occupational Health and Safety*.
- Takala, J., Hämäläinen, P., Saarela, K. L., Yun, L. Y., Manickam, K., Jin, T. W., ... Lin, G. S. (2014). Global estimates of the burden of injury and illness at work in 2012. *Journal of Occupational and Environmental Hygiene*. <https://doi.org/10.1080/15459624.2013.863131>
- Taufek, F. H. B. M., Zulkifle, Z. B., & Kadir, S. Z. B. A. (2016). Safety and Health Practices and Injury Management in Manufacturing Industry. *Procedia Economics and Finance*. [https://doi.org/10.1016/s2212-5671\(16\)00088-5](https://doi.org/10.1016/s2212-5671(16)00088-5)
- Tobor-Osadnik, K., Wyganowska, M., & Manowska, A. (2017). Employee attitudes to work safety in Poland's coal mining companies. *Journal of the Southern African Institute of Mining and Metallurgy*, 117(1), 3–5. <https://doi.org/10.17159/2411-9717/2017/v117n1a7>
- Umeokafor, N., Kostis, E., Lundy, S., Isaac, D., Stuart, A., Igwegbe, U., & Boniface Umadi. (2014). The Pattern of Occupational Accidents , Injuries , Accident Causal Factors and Intervention in Nigerian Factories. *Developing Country Studies*.
- VISUOMENĒS SVEIKATA. (2014). 1(64).
- Wekoye, S. A., Moturi, W. N., & Makindi, S. M. (2019). Knowledge and Attitudes on Practices of Occupational Safety and Health in the Informal Non-food Manufacturing Sector in Kampala City, Uganda. *Current Journal of Applied Science and Technology*, 36(6), 1–12. <https://doi.org/10.9734/cjast/2019/v36i630266>
- World Health Organization. (2010). *WHO Healthy Workplace Framework and Model : Background and Supporting Literature and Practices*.
- World Health Organization. (2014). *Ebola virus disease ( EVD ) – Occupational Safety and Health*. (September), 1–4.
- Zainol, N. Z., Mohd Zahid, M. Z. A., Ahmad, M. M., Zailani, Z. N., & Ab Manaf, M. B. H. (2020). Influence of Worker's Attitude and Communication Skill towards Safety Performance in Construction Site. *IOP Conference Series: Earth and Environmental Science*, 476(1), 12014. <https://doi.org/10.1088/1755-1315/476/1/012014>
- Zanko, M., & Dawson, P. (2012). Occupational Health and Safety Management in Organizations: A Review. *International Journal of Management Reviews*, 14(3), 328–344. <https://doi.org/10.1111/j.1468-2370.2011.00319.x>
- Živković, S., & Ivanovab, T. (2016). Organizational culture as one of the main factors for the successful safety management. *Serbian Journal of Management*, 11(1), 69–80. <https://doi.org/10.5937/sjm11-7990>
- Živković1, D., Todorović, S., & Ivana B, U. (2015). MANAGEMENT OF HEALTH , SAFETY AND WELLBEING OF. *Economics of Agriculture*, 2015(6), 677–692.