UNIVERSITY OF CAPE COAST

OCCUPATIONAL HEALTH AND SAFETY AMONG AUTO-ARTISANS IN SUAME MAGAZINE-KUMASI, GHANA

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BY

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Thesis submitted to the Department of Population and Health of the Faculty of Social Sciences, College of Humanities and Legal Studies, University of Cape Coast, in partial fulfilment of the requirements for the award of Doctor of Philosophy degree in Population and Health

SEPTEMBER, 2019

DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this University or elsewhere.

Candidate's Signature……..... Date……..

Name: Addae Boateng Adu-Gyamfi

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Signature …… Date ……

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Name: Dr David T. Doku

ABSTRACT

Auto-artisanship plays a critical role in the economy of Ghana. It forms a large size of the informal economy in Ghana. The occupational health and safety of auto-artisans is therefore of exceptional concern because of their potential exposure to toxic chemicals, the tools and methods they apply, and the unregulated settings in which they operate. Even though some research work has been done to examine the safety of auto-artisans at the Suame magazine enclave, such studies focused on a few selected artisanal trades. In contrast, the current study sought to assess occupational health and safety among auto-artisans engaged in all the artisanal trades existing at the enclave with the aim to contribute to the broader understanding of workplace safety among auto-artisans in Suame magazine. The study was guided by the positivist philosophy. The protection motivation theory and DEFENS Study conceptual framework were employed for the study. Survey (N=957) and 58 observations were used to generate data for the study. Data was analysed using descriptive and inferential statistics. Twenty-nine auto-artisanal trades were identified at the enclave. It was also found that orientation on workplace safety is organised for new auto-artisans. Orientation on OHS was found to influence awareness of workplace hazards but not perception of risk of job. While organisational factors were found to be associated with safety practices among auto-artisans, they were not found to be associated with willingness to pay for occupational health and safety services. It is recommended that there should be intensive education on occupational health and safety among auto-artisans in Suame Magazine.

KEY WORDS

Occupational health and safety

Occupational injuries and illnesses

Suame magazine

Informal economy

Auto-artisans

Willingness-to-pay

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DEDICATION

To Nhyira Obeng Amoah, my beloved daughter

and

Abena Boama my late mother, to whom I owe my higher education

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LIST OF ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
DEFENS	Drug Exposure Feedback and Education for Nurses' Safety
EASHW	European Agency for Safety and Health at Work
EU-OSHA	European Union Information Agency for Occupational Safety and Health
GDP	Gross Domestic Product
GMT	Greenwich Mean Time
GNAG	Ghana National Association of Garages
HSE	Health and Safety Executive
ILO	International Labour Organisation
MMA	Magazine Mechanical Association
MOH	Ministry of Health
OHS	Occupational Health and Safety
PPE	Personal protective equipment
PMT	Protection Motivation Theory
PNDC	Provisional National Defence Council
SMIDO	Suame Magazine Industrial Development Organisation
SPSS	Statistical Package for the Social Sciences
WIEGO	Women in Informal Employment: Globalising and Organising
WHO	World Health Organisation
WTP	Willingness-to-pay

CHAPTER ONE

INTRODUCTION

Background to the study

The informal economic activity has remained a subject of intellectual investigations over the past decades because of its contributions to the world economies (Medina, 2007). There exist different definitions of the concept of informal economy in the literature. Hart (1973), who first coined the term, described it as unregulated economic enterprises or activities, referring to the income-generating activities of the urban poor in Ghana.

Generally, the informal economy has been the backbone of the economies of many developing countries of the world, especially sub-Saharan African countries. According to Medina (2007), the informal sector plays significant roles in the economies of developing countries and yields much benefit to such countries. Citing WIEGO (2000), Medina asserts that the informal economy accounts for a greater proportion of employment outside the agricultural sector across the globe with 65 percent and 72 percent in Asia and sub-Saharan Africa respectively. Medina goes further to indicate that when agricultural employment is included the figure for sub-Saharan Africa rises to beyond 90 percent. While Chen (2006) estimates that the informal economy provides between 50 and 75 percent employment opportunities outside the agricultural sub-economy in developing countries, Schneider (2002) suggests that it produces as much as 18

percent of employment in developed countries. The differences in the proportion of the contribution of the informal economy to employment in developing countries, as suggested by different studies need further investigations, particularly as there is a renewed interest in the informal economy in recent years globally (Chen, 2012), with more observers (ILO, 2002; Bhat & Yadav, 2017) concluding that the size of the informal economy is rising speedily than the formal economy in recent years.

Currently, the informal economy leads in the employment ratio in many developing countries including Ghana. Even though there is no specific data on the size of the informal economy in Ghana, several studies have made estimates. For example, the Ghana Statistical Service (2016) estimates that the informal economy employs 90 percent of the labour force in Ghana while Clarke (2005) puts the size of Ghana's informal economy at 70 percent. Similarly, Osei-Boateng and Ampratwum (2011) estimated that the informal sector in Ghana employs 80 percent of the working population. It is therefore not out of place to state that the informal economy in Ghana holds a greater percentage of the workforce of the country and serves as a wheel upon which the economy drives in terms of job creation and productivity. Despite the significant role played by the informal economy in the economic development of Ghana, issues of occupational health and safety (OHS) within the sector often receive less attention (Barling et al., cited in Puplampu & Quartey, 2015).

For some time now, health and safety of workers, especially at the workplace, has been the concern of all, including labour unions, governments, as

well as international and local organisations (Alli, 2008; Burton, 2010). Friend and Kohn (2007) are of the view that "*occupational safety and health is concerned with preserving and protecting human and facility resources in the workplace*" (p.2). For example, since the creation of the International Labour Organisation (ILO) in 1919, the protection of workers against accidents, sickness, disease and injury related to the working environment has been a central issue (Alli, 2008). Furthermore, due to the prominence placed on the health and safety of workers, various trade unions have attempted to unify workers in the informal economy to ensure that they work in environments which are not harmful to them while securing their basic human needs at the workplace (Osei-Boateng & Ampratwum, 2011).

Nonetheless, occupational health services are often not provided to workers in small and medium size enterprises, and those in the informal economy (Rantanen & Warshaw, 2011). Again, workers in the informal economy in many developing countries often find it difficult to access occupational health services because of inadequate resources allocated to the sector (Siriruttanapruk, Wada & Kawakami, 2009), leading to high rates of occupational injuries and diseases. Although safety management has generally advanced substantially during the last few decades, occupational accidents and injuries still form a significant proportion of work-related health problems globally (Willquist, 2005). It has been established that occupational hazards, risks, injuries and diseases are estimated to be more prevalent in Small and Medium Scale Enterprises (SMEs) than in large enterprises (Health and Safety Executive, 2005). As suggested by Lentz and

Wenzl (2006), workplace fatalities are higher in industries characterised by many small businesses since such businesses have inadequate resources and technical capacity to deal with health and safety concerns. Operators and workers of SMEs, mainly those in the informal economy also have limited awareness of the existence of occupational safety and health standards, and how to conform to those standards without destabilising business flow and performance (ILO, 2005), leading to occupational injuries and diseases with high economic and social costs.

The costs of occupational accidents, injuries and illnesses have been a cause for concern at all levels from the individual workplace through national to international arena. Jilcha and Kitaw (2016), estimates that over 2.3 million workers suffer from work-related diseases and injuries in the world yearly. He further states that about two-thirds of these workers stay away from work for four working days or longer resulting in economic, social and human costs.

Citing Rubens, Oleckno and Papaeliou (2005), Kendal (2005) posits that the workplace is a significant and regular contributor to diseases, injuries and injury fatalities. More so, it has been estimated that 2.34 million occupational deaths occur across the world every year while the annual rate of occupational accidents is estimated at over 270 million (ILO, 2013; Hamalainen, Takala, & Saarela, 2006) while Pillay (2014) estimates about 337 million accidents and 160 million illnesses occur each year. Similarly, it is estimated that 2 million health-care workers are exposed to the risk of contracting infectious diseases including HIV/AIDS and Hepatitis B from exposure to sharp instruments annually (WHO, 2002; Wilburn, 2004).

According to Mock, Adjei, Acheampong, DeRoo and Simpson (2005), occupational injuries are a significant danger among informal economy workers in Ghana. According to them, Ghana's annual occupational injury rates have been estimated around 11.5 injuries/1,000 and 44.9/1,000 persons in the urban and rural areas respectively. A study conducted by Kumah, Cobbina and Duodu, (2011) also revealed that 65.5 percent of welders at Suame Magazine in Kumasi have one or more ocular conditions, including macula problems, pterygium, photokeratitis and cataract, gritty and burning sensations.

In 1995, the World Health Assembly of the World Health Organisation (WHO) sanctioned the Global Strategy on Occupational Health for All which encouraged government across the world to establish national policies and programmes for occupational health (Burton, 2010:8). Ironically, Ghana does not have a national policy on OHS (Alfers, 2002), a draft policy document developed over a decade ago is yet to be adopted. Even though the 93rd session of the International Labour Conference in 2005 resolved that "*the building and maintenance of a national preventive safety and health culture and the introduction of systematic approach to OHS management at the national level are the fundamental pillars of a global strategy*" for the safety and health of workers (ILO, 2005:6). The irony is that Ghana is a signatory to the above conventions which enjoins it to have a national policy on OHS. The only refuge is sought in the Ghana Labour Act 2003, Act 651 which requires employers in Ghana to ensure that their employees are not exposed to conditions that would cause work related injuries or illnesses to them.

Significantly, there is no single specific national body which oversees OHS practices in Ghana, leaving the country with different agencies operating under different jurisdictions monitoring different industries for workplace and employee safety (Asumeng, Asamani, Afful & Badu, 2015). For instance, the Ghana Health Service has a guideline on health and safety for health care workers while the Road Safety Commission guidelines has been developed mainly for the transport industry. Similarly, the Minerals Commission of Ghana has also developed the Mining Regulations 1970, which guides the activities of mining and miners in the country. However, in the view of Menendez, Benach and Vogel (2009), the development of strong, proactive government measures on OHS ensures employers' compliance with health and safety standards and respect for workers' rights to safety work environments.

The management of occupational health, safety and well-being of workers is important to the effective operation of both large and small-scale firms and businesses. Evidence links client safety, firm growth and development with the safety, health and well-being of workers at the workplace (WHO, 2001). It is therefore important to make OHS services available and accessible to workers at all levels.

Major challenges within OHS and its management include how to estimate frequency and prevalence of disease and injury across variables such as occupational status, geographical location or number of years of working experience (Kendall, 2005). Another key element which affects the health and safety of workers in the informal economy is the willingness of both workers and

employers to pay for OHS services to ensure a life free of injuries and diseases in the workplace. For example, in a study on OHS practices among carpenters in the Oyo State of Nigeria, Bolaji (2005) found that 64.1 percent of the respondents indicated they were not willing to pay for OHS training. Willingness-to-pay (WTP) is therefore important in OHS studies.

Statement of the problem

The workforce of every nation is the mainstay of its economy and therefore the health and safety concerns of workers are to be considered paramount in the designing and implementation of policies and programmes to guide activities at the workplace. Subsequently, OHS has become a major public health concern across the globe (Tremblay & Badri, 2018) as it causes enormous economic and human losses to societies (Leppink, 2015). Injuries and illnesses related to occupation are increasing at an alarming rate (Tadesse, Bezabih, Destaw & Assefa, 2016). The ILO suggests that there are over 264 million accidents resulting in work-related illnesses, which lead to high number of days of absence from work (International Labour Office, 2014). For example, available evidence indicates high rates of work-related deaths and injuries in developing countries (Amponsah-Tawiah & Mensah, 2016; National Safety Council, 2014; Takala et al., 2014).

The continuous increases in the incidences of occupational hazards and diseases among workers in the informal economy have continually drawn the attention of researchers, governments and policy makers towards ameliorating the

situation (Oranusi, Dahunsi & Idowu, 2014). Similarly, many development agencies have paid much attention to the role the informal economy plays in the development and growth of developing countries (Feige, 1990) but little research has been conducted on the OHS of the main players (workers and employers) in the informal sector in developing countries especially among auto-artisans in Ghana. Researchers in OHS also usually focus on large industries where access to data is less difficult. Even though various studies have been conducted in Suame Magazine (Jaarsma, Maat, Richards & Wals, 2011; Kumah et al., 2011; Gheorghe, 2009; Amedorme & Agbezudor 2013), little has been done on the OHS of the auto-artisans at the enclave. Many of these researches focused on specific health problems; for example, Kumah et al. investigated "radiation-related eye diseases among the welders; Dartey et al. (2014) studied lead in airborne particulates from car battery repair work while Adei, Adei, and Osei-Bonsu (2011) investigated knowledge of occupational diseases arising out of spray particles among sprayers.

Similarly, consumers' WTP for OHS service has also not been well investigated in the informal economy in Ghana more especially among auto-artisans. Moreover, the available data on WTP are mainly on water resources, improved electricity, renewable resources and environmental pollution (Jianjun, Wenyu, Ying & Xiaomin, 2016; Baumgärtner et al., 2017; Yishay et al., 2017; Andor, Frondel & Sommer, 2018; Ntanos, Kyriakopoulos, Chalikias, Arabatzis & Skordoulis, 2018; Balasubramanian, 2019). Again, these researches do not reflect the views of artisans in developing countries such as Ghana and more particularly,

among auto-artisans in the Suame Magazine enclave. This, therefore, calls for a study on the WTP for OHS services by artisans at Suame Magazine. Research on the Suame Magazine enclave has been on piece-meal bases with studies touching on well-known trades at a time and specific health conditions. There has not been enough research involving all auto-artisanal trades at the enclave. Again, a profile of all auto-artisanal trades is needed for policy formulation and intervention. However, no such profile was sighted in the literature or was available at the offices of the Ghana National Association of Garages (GNAG) or the Suame Industrial Development Organisation. (SMIDO) As a result, there was the need to profile all auto-artisanal trades at Suame Magazine.

This study, therefore, sought to fill this gap by assessing the OHS issues among auto-artisans in Suame Magazine in Kumasi and to examine their awareness of workplace hazards, their safety practices and WTP for safety services. More importantly, the occupational health of auto-artisans at Suame Magazine is of exceptional concern because of their potential exposure to toxic chemicals, physical materials, the tools and methods they apply, and the unregulated settings in which they work. This is because in the view of Lentz and Wenzl (2006), workplace fatalities are higher in industries characterised by many small businesses such as those at Suame Magazine.

The dearth of research in the area raises a number of questions such as: are auto-artisans aware of OHS hazards and risk? What are the OHS practices among auto-artisans in Kumasi? Are auto-artisans willing to pay for OHS services? Is

there any relationship between perception of risky job and use of personal protective equipment (PPE) by auto-artisans?

Objectives of the study

The general objective of the study was to assess OHS among auto-artisans at Suame Magazine. Specifically, the study sought to:

i. Profile the various auto-artisanal trades at Suame Magazine;

ii. Examine the awareness of OHS hazards among auto-artisans in Suame Magazine;

iii. Assess the OHS practices among the auto-artisans; and

iv. Investigate the willingness of auto-artisans to pay for OHS services,

Hypotheses of the study

Hypothesis 1

Ho: There is no statistically significant relationship between OHS orientation artisans received and their awareness of workplace hazards

H1: There is statistically significant relationship between OHS orientation artisans received and their awareness of workplace hazards

Hypothesis 2

H_o: There is no statistically significant relationship between OHS orientation artisans received and perceived risky job among auto-artisans

H1: There is statistically significant relationship between OHS orientation artisans received and perception of risky job among auto-artisans

Hypothesis 3

H_o: There is no statistically significant relationship between awareness of occupational hazards and the use of PPE by auto artisans

H1: There is statistically significant relationship between awareness of occupational hazards and the use of PPE by auto artisans

Hypothesis 4

H_0: There is no statistically significant relationship between organisational factors and safety practices among auto-artisans

H1: There is statistically significant relationship between organisational factors and safety practices among auto-artisans

Significance of the study

For Ghana, a country where the informal economy employs 90 percent of its workers (Ghana Statistical Service, 2016), there is the need for a comprehensive framework on OHS to guide and protect the safety of the workplace and workers in the informal sector. However, Ghana has not developed any national policy on OHS of auto-artisans in the informal economy. This study will serve as the basis for increasing the awareness of workplace health and safety among auto-artisans and identify the weaknesses of the various strategies that auto-artisans employ to enhance health and safety at their workplaces and recommend possible ways of improving the health and safety practices among artisans.

The study will help stakeholders to improve safety systems at the Suame Magazine enclave to protect the health of auto-artisans and other people who are

engaged in various activities at the enclave. The outcome of the study will reveal how auto-artisans within the informal economy perceive and understand OHS risks associated with their work. It will also pinpoint gaps which need to be filled for artisans who need additional training regarding certain aspects of the OHS. It will therefore inform policy on the health and safety of auto-artisans in Ghana.

The study will fill the gap in literature with respect to socio-demographic changes in the membership of auto-artisans in Suame Magazine and Ghana in general. It will serve as a reference material for academics and students who intend to carry out research in OHS among informal sector workers. It will also inform areas of further research in the field of OHS. Finally, the study will contribute to the existing body of knowledge in the field of OHS among auto-artisans in Ghana.

Limitations of the study

Since the data were collected from individuals, there was the risk of social desirability bias in responses and possibly an over-reporting of good health and safety practices. The use of quantitative approach as the main approach for the study served as a limitation to this study because it could not provide adequate answers to the "why and how" of auto-artisans' actions towards OHS. For example, the study could not assign reasons for health and safety practices among respondents such as use of PPE. Again, there was little opportunity to explain specific issues on the minds of the respondents. This could have been better achieved with in-depth interviews or focus group discussions. This limitation did

not negatively affect the quality of the study because of the use of observation to confirm or ascertain some of the responses given by respondents such as the use of PPE. The study was limited to only auto-artisans at the Suame Magazine enclave. The subject matter of interest, time and resource constraints did not permit the inclusion of auto-artisans at other parts of Kumasi or Ghana as a result, the findings of the study could not be generalised to represent the views of all auto-artisans in Ghana.

Structure of the thesis

This study starts with a general introduction to some of the reasons accounting for the renewed interest in OHS in developing countries. This first chapter presents a brief profile of the informal economy in Ghana. It then looks at the question of occupational injuries and illnesses among various sectors from the global through regional to the Ghanaian perspective, concentrating on artisans in the informal economy. The statement of the problem, research objectives, and finally, the research hypotheses underlying the study and the significance of the study also feature in this chapter.

Chapter two provides a collated and synthesised definition of the key concepts that will be used in the study regarding their conceptualisation and application. It examines the concepts of occupational health, risk, hazard injury and occupational illnesses. The chapter also looks at the interrelationships or links between these concepts, which informed the basis of the theoretical and conceptual frameworks of the study, which is presented in detail.

Chapter three looks at a detailed literature review which provided focus for the study regarding identification of gaps as well as approaches and methodologies employed by other researchers in the field of OHS especially in developing countries.

The fourth chapter focuses on the research methodology. The Chapter provides information on the level of interactions between the players of the informal economy and risk, hazards, injuries and diseases. In this chapter, the cross-sectional research approach, and the rationale for adopting this approach are presented. It also reflects on the data collection and analyses processes as a way of establishing the reliability and validity of the data to be used in the study.

Chapter five marks the beginning of the empirical chapters which present the findings of the study based on the study objectives and set hypotheses. It discusses the findings taking into consideration the conceptual and theoretical frameworks employed for the study. Findings are examined using existing literature as a guide. This chapter also deals with the profile of the various artisanal trades at Suame Magazine and a description of the trades. It also looks at the personal characteristics of the artisans in relation to the artisanal trades.

Chapter six forms part of the empirical chapters and examines orientation on health and safety organised for new entrants. It also examines the awareness of occupational and safety hazards among respondents. It looks at the relationship between OHS orientation received by artisans and their awareness of workplace hazards.

Chapter seven assesses the OHS practices among auto-artisans. It discusses the relationship between personal characteristics of artisans, perception of risk, awareness of workplace hazards and safety practices. Chapter eight presents findings of the investigation into the willingness of artisans to pay for OHS services. Occupational health and safety services examined are the WTP for reading materials on OHS, WTP for training on OHS, and the WTP for the services of a medical doctor.

Chapter nine contains the summary of the study and concluding discussions. It provides the summary of the thesis, a recapitulation of the main conceptual and theoretical models and their relevance to the finding of the study, responses to research questions.

CHAPTER TWO

THEORETICAL AND CONCEPTUAL ISSUES IN OCCUPATIONAL HEALTH AND SAFETY

Introduction

This chapter looks at the theoretical and conceptual issues related to OHS. Issues discussed in the chapter include occupational health; workplace injuries and causes of occupational injuries and illnesses; WTP for occupational health services; and hazards, safety, and risk. Issues related to international OHS conventions as well as acts governing workplace safety in Ghana are also discussed. Various theories and models of OHS including the protection motivation theory, human factor theory of accident causation and risk homeostasis theory were also discussed.

Conceptualising occupational health and safety (OHS)

The concept of occupational health defies a single definition; and has therefore been defined differently by various authors. The Joint ILO/WHO Committee on Occupational Health stated in 1950 that, Occupational health should aim at the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention amongst workers of departures from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment

adapted to his physiological and psychological capabilities (Stellman, 1998). This definition has guided various authors in their attempt to define and assess OHS. According to Hughes (2007), OHS with the welfare of workers and the safeguards facilities and equipment at the workplace to maintain the highest level of health, safety and the well-being of workers at the workplace.

According to the WHO cited in Tadesse and Admassu (2006:4) "*OHS aims at protection and promotion of the health of workers by eliminating occupational factors and conditions hazardous to health and safety at work; enhancement of physical, mental and social well-being of workers and support for the development and maintenance of their working capacity"*. It also deals with professional and social development at work, development and promotion of sustainable work environments and work organisations. In the same vein, Johnson (2008) argues that OHS is concerned with minimising and eliminating potential safety hazards at the workplace. It must therefore, be recognised as an important corporate goal of an organisation (European Commission, 2011). Muto, Mizoue, Araki, Miyazaki and Marui (2002) are also of the view that occupational health is a basic component of the social and health dimensions of the principle of sustainable development which constitutes a set of key activities for development. Table 1 depicts some of the various definitions of OHS.

Table 1: Summary of key conceptualisation of occupational health

Author/year	Definition
ILO/WHO (1950)	Occupational health is the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations by preventing departures from health, controlling risks and the adaptation of work to people, and people to their jobs.
Industrial Accident Prevention Association (2007)	The development, promotion, and maintenance of workplace policies and programmes that ensure the physical, mental, and emotional well-being of employees.
Tadesse and Admassu (2006)	Occupational health is a diverse science applied by occupational health and others professionals who have an interest in the protection of the health of workers in the workplace
Bernet-Schuster (2008)	Multi-disciplinary issue concentrated with the protection for safety, health and welfare of people in work or employment.
Alli (2008)	The science of the anticipation, recognition, evaluation and control of hazards arising in or from the workplace that could impair the health and well-being of workers, taking into account the possible impact on the surrounding communities and the general environment.
European Agency for Safety at Work (2011)	Occupational health aims at the promotion and maintenance of the highest degrees of physical, mental and social well-being of workers in all occupations
Bhagawati (2015)	Occupational health is a multidisciplinary concept that concentrates on the promotion of safety, health, and welfare of people engaged in work or employment.

Amponsah-Tawiah and Dartey-Baah (2011)	Occupational health and safety encapsulate the mental, emotional, and physical well-being of the worker in relation to the conduct of his work and, as a result, marks an essential subject of interest impacting positively on the achievement of organisational goals.
Correll (2019)	Occupational health and safety is the field of public health that studies trends in illnesses and injuries in the worker population and proposes and implements strategies and regulations to prevent them.

Source: Author's compilation from various sources (2016)

Touching on its scope, Alli (2008:17) posits that "OHS is an extensive multidisciplinary field, bothering on issues related to areas such as medicine–including physiology and toxicology–ergonomics, physics and chemistry, as well as technology, economics, law and other areas specific to various industries and activities". This view is supported by Tadesse and Admassu (2006) who suggest that OHS is a broad discipline applied by professionals from engineering, environmental health, chemistry, toxicology, and all those with interest in the protection of workers in the workplace. Similarly, Friend and Kohn (2007:2) are of the view that OHS*" is concerned with preserving and protecting human and facility resources in the workplace …. a field wherein professionals attempt to prevent catastrophic losses*". This they believe involves assisting people at the workplace by making sure that they are not injured or become ill because of hazards in their workplaces. In the view of Ronda-Pérez & Moen (2017) OHS

aims at helping employers and employees comply with local and organisational health and safety regulations.

Even though workplace health and safety is important to the worker, employer, client, community and nations at large, occupational health services are not equally available to all workers around the world as should have been the case (Rantanen & Fedotov**,** 2011). According to Rantanen (2005), only about 15 percent of the world's working population have access to OHS services. This varies according to the part of the world one finds himself or herself working. In more developed countries the coverage of occupational health services ranges between 15 percent and 90 percent, while it varies between three percent and 20 percent in developing countries. This assumption is confirmed by Nicholson (2004) who reported that in 2003 only about 14 percent of workers in the United Kingdom benefited from comprehensive occupational health services. These services are not available to every worker partly due to the inadequacy of OHS professionals around the world (Nicholson, 2004). In many countries, especially in the developing world, despite efforts made by WHO and ILO to ensure that all countries provide workers with workplace safety, many sectors of their economies, especially those in the informal sectors, are generally not covered by appropriate and adequate OHS policies and programmes (Rantanen & Fedotov, 2011) thereby affecting the coverage of OHS which in turn impacts on the lives of workers negatively. This is because interventions to enhance OHS among workers often require huge resources or expertise which is beyond the pockets of entrepreneurs in informal economies (MacEachen et al., 2008).

Even though all relevant instruments and programmes of the ILO and others such as Friend and Kohn (2007) use the term "occupational safety and health" other authors including Alli (2008) and Tadesse and Admassu (2006) use the concept "OHS". For the purposes of this work, OHS is adopted rather than occupational safety and health. This does not mean approval and or support of or disapproval for either of the usages.

Operational definition of OHS

In operationalising OHS, the current study adapts the definitions of OHS by Bernet-Schuster (2008) and Correll, (2019) and defines occupational health and safety is a complex field which studies trends in injuries and illnesses and concerned with the protection and promotion of the health, safety and well-being of workers and recommends and implements policies, guidelines and interventions for their prevention. This is because health and safety among auto-artisans at Suame Magazine is multifaceted and involves education, training, protection, promotion, behavioural change and the welfare of artisans.

A brief background on occupational health and safety

Prior to the early 1990s, little was known about the global burden of diseases, injuries and risk factors at the workplace. This problem instigated the World Bank and the WHO to initiate a Global Burden of Disease study in 1991 meant to provide up-to-date information on the trend of global burden of occupational workplace injuries and diseases. The global burden of disease

studies in 187 countries in 2010 reported critical prevention mechanisms for occupational diseases and injuries (Murray & Lopez, 2013).

Indeed, work related injuries and illnesses are among the critical factors contributing to the global burden of diseases and injuries in recent times. Essentially, the impacts of such diseases do not only affect the individual, family, community and country but also the international community as it has implication on global productivity. For as many countries that report such incidences, the estimated cost is not consistent. While some countries have estimates of about 2 percent of Gross Domestic Products (GDP) others report GDP of around 14 percent (Leigh, Macaskill, Kousma, & Mandryk, 1999). The ILO for example, estimates it around 4 percent of annual global GDP (ILO, 2006). Hence, several scholars and international organisations (Rodgers et al., 2004; Nelson et al, 2005; Schulte, 2005; Takala et al., 2014; World Health Organisation [WHO], 2009) have taken keen interest in workplace injuries and diseases, reporting statistics on their growth and seeking ways to help reduce the rate of occupational injuries and diseases. Such concerns may be explained, in part, by the fact that knowledge on the causes, rate and regional distribution is key to preventing workplace diseases and injuries in various geographical settings (WHO, 2009).

The WHO, has taken much responsibility in updating the world on global burden of occupational injuries and diseases. In their project, *Global Burden of Disease,* the WHO reports estimate on mortality and morbidity by work related diseases for more than 135 different causes of workplace injuries and diseases. Other several documents on comparative risk assessment have been produced

including "*The Global Health Risk Report*" (WHO, 2009). Additionally, reports by the ILO (2005) estimate that, occupational injury and illness represent about 2.2 million deaths annually. About 350,000 deaths of this number account for only fatal occupational injuries. Nonetheless, the challenges of informing the world about such crucial issue are poor data and different reporting systems within countries, making inter countries comparisons difficult (Leigh et al., 1999).

While these studies are useful in updating future researchers on the current growth and dimension of occupational injuries and illnesses, the studies are done at the macro level with little emphasis on local dynamics of occupational injuries and illnesses. As Leigh et al. (1999:630) observed, to offer appropriate solution to the rising numbers of global burden of occupational illnesses and injuries, "local estimates, particularly, at the subnational and national levels would be valuable contribution." The current study moves in that direction by examining a national and local context on workplace injuries and illnesses with much focus on the informal economy in a developing country.

Occupational health and safety conventions

Global magnitude of occupational injuries, diseases, and deaths prompted the ILO and other recognised bodies to work towards the reduction of hazards associated with the workplace (WHO, 2014). This involves the promotion and protection of physical, mental, and social well-being of workers in all occupations against injuries and diseases caused by their working conditions and environment (MOH, 2010; ILO, 2012).

The safety and health of workers are the focus of OHS conventions in order to ensure a safe and healthy work environment (ILO, 2012). OHS conventions also focus on protection of co-workers, relatives, employers, customers, and among other people who might be affected by the workplace environment (Hughes & Ferrett, 2013).

OHS management and practices globally is based on conventions and policies enacted by the WHO and the ILO to prevent, control, cure, treat, rehabilitate, and promote workplace activities for the improvement of working conditions (Hamzoui, 2007). These Conventions and policies on OHS and its services provide that OHS services should be available. Recognising that workplace safety is the right of each worker, irrespective of the sector of the economy (ILO, 2012; WHO, 2014). The conventions therefore, include people who are self-employed in areas such as agriculture, home industries and artisans in the hidden economic sector (Hamzoui, 2007).

The conventions also cover the protection and promotion of occupational health for all working persons everywhere. It is also stipulated in the conventions that OHS across the globe at work settings should not only include health problems directly related to work, but also work-related diseases, problems of general health and working capacity of individuals (Hamzoui, 2007).

In addition, the main principles of OHS policies in every working environment are: avoidance of workplace hazards, combination of production and safety activities, efficiency in the development and regulation of working environment (Hamzoui, 2007; WHO, 2014). Again, ILO demands the protection

of the needs of older workers, including identification and elimination of occupational hazards and working conditions that hasten the ageing process and reduce their working capacity (ILO, 2009). These conventions are to ensure that the health and safety of all workers irrespective of age or sector of employment are protected.

During the ILO's General Conference in Geneva on the 3rd of June, 1981, the adoption of certain proposals was decided upon with regard to safety and health, and the working environment which led to the adoption of the OHS Convention, 1981 (No. 155) as an international convention (ILO, 2009; Abrams, 2001). While considering national conditions and practice, Occupational Safety and Health Convention recommend a coherent national occupational safety and health policy, as well as actions to be taken by governments and within enterprises to promote occupational safety and health and to improve working conditions (ILO, 2009). In view of the convention, the ILO provides for the formation of procedures and the intermittent evaluation of the measures for the recording and reporting of occupational accidents and illnesses for documentation and publication (ILO, 2009).

The occupational health and safety Conventions also apply to all aspects of economic activity and to all workers in in any economic activity (Takahashi, Smith, Yoshino, Tanaka, & Takala, 2006). Considering national conditions and practice, and in consultation with workers' representatives, each country is required to enact, implement and occasionally appraisal effective national policies on OHS including safe the working environment (Takahashi et al., 2006). This,

according to ILO, is to prevent accidents and injury to health arising out of work and by minimising the causes of hazards inherent in working environments (Takahashi et al., 2006). This noble idea is however missing in many developing countries including Ghana.

The WHO launched the Global Framework for Healthy Workplaces in April 2010 aimed at providing companies with basis of promoting good practices and tools that fit the physical, psychological, and social health conditions of workers and their workplaces (WHO, 2014). The WHO therefore recommends in its Resolution as part of promoting OHS that workers and their employers should team-up and protect the wellbeing of every worker to ensure a safety working conditions (WHO, 2014). Thus, member states, employers, and organisations should consider the health and safety concerns in the workplace (WHO, 2012).

The European Agency for Safety and Health at Work (EASHW) was founded by the EU in 1996 as part of EU's contribution to promoting OHS among member states (EU-OSHA, 2007). All the member states are therefore enjoined to guarantee the provision of all necessary legal requirements of the worker unions on OHS. All member states were further challenged to promote strong cooperation between employers and workers (EU-OSHA, 2007). European Union also requests employers to assess workplace risks and put in place preventive measures from the elimination of the hazard to the use of PPE (EU-OSHA, 2007).

In the United States, the Occupational Safety and Health Act (Public Law 91-596) was passed in 1970, requiring an employer to provide workers with safer work environment devoid of dangers which can cause injuries or death (WHO,

2014; Fanning, 2003). According to the Act, employers are required to provide safe workplaces for their workers through provision of training and education on workplace safety to workers (Fanning, 2003).

In Ghana, Section 24(1) of the 1992 4th Republican Constitution establishes the right of everyone to work under safe and healthy conditions without any injury and hazards (Republic of Ghana, 1992; Abrams, 2001; Amponsah-Tawiah & Dartey-Baah, 2011; Annang, 2014). In line with this fundamental human right, the Labour Act, 2003 (Act 651) was promulgated for employment and labour related matters, such as, labour laws, industrial relations and occupational safety and health (Adjotor, 2013). To ensure safety of workers and their employers, the Labour Act, 2003 (Act 651) of Ghana requires that every worker employed works under satisfactory, safe and healthy conditions (Amponsah-Tawiah & Dartey-Baah, 2011). By this, employers are required to provide and maintain equipment and tools at the workplace and make sure that are safe and has no potential risk to health and safety of workers (Amponsah-Tawiah & Dartey-Baah, 2011).

To ensure safety at the workplaces, every worker is also obliged by the Labour Act, 2003 (Act 651) to use safety appliances and PPE the employer makes available to workers and also comply with the employer's safety directions. In addition, as a way of ensuring safety, the Act protects the rights of workers to remove themselves from any situation in the workplace which they have reasonable cause to believe presents an imminent danger to their life (Annang, 2014). In effect, the Act obliges all organisations and employers to ensure the

enforcement of its provisions relating to the working conditions of workers, the protection of workers from harm and the safety of the entire workplace (Annan, 2010).

There is no national policy on OHS in Ghana, however, the Factories, Offices and Shops Act 1970, Act 328 and the Workmen's Compensation Law 1987, PNDC Law 187 are the two main statutes that inform the execution of OHS of workers in Ghana (Adjotor, 2013; MOH, 2010). The Factories, Offices and Shops Act 1970, Act 328 (Republic of Ghana, 1970) was passed into law in 1970 by act of parliament in Ghana in order to regulate activities in the formal sectors of employment in the country (MOH, 2010). This act obliges employers to reduce risk and injury as well as safeguard workers' safety in the performance of their respective roles through the notifications the act provides (Adjotor, 2013). Act 328 therefore requires every worker either in factories, offices or shops to have access to the act and to adhere to what is stipulated in it. Accordingly, the Department of Factory Inspectorate was created by Act 328 of 1970 to ensure the inspection of workplaces so as to guarantee the maintenance of reasonable standards of health and safety, prosecution of offences against the Act, and investigation of reportable occupational accidents and dangerous occurrences (MOH, 2010). However, not covered under this Act, are industries operating within the informal economy of the country, including those in the vehicle repair industry, many of whom work under trees and public open spaces. Provisions in the Act are also very limited in scope and do not provide inadequate protection for workers (Amponsah-Tawiah & Dartey-Baah, 2011). For example, preventive

strategies such as risk assessments, medical surveillance and control of hazards are not catered for in the Act therefore making the Act inadequate to protect workers' health and safety.

The Workmen's Compensation Law 1987, PNDC Law 187 was also enacted to ensure that the employee is offered cash compensation by the employer for personal injuries resulting from accidents at workplace to ensure OHS at work. The PNDC Law 187 requires employers to pay a compulsory compensation to their workers for personal injuries, death or disablement caused by accidents during work but not under the influence of drugs or alcohol at the time of the incident (Annan, 2010).

Theoretical and conceptual perspectives

Theories are vital elements of social science research which should not be ignored. The choice of theory shapes the way researchers gather and interpret data (Alderson, 1998). This study was guided by a number of theoretical and conceptual approaches because the study examined OHS from different perspectives within the health and safety framework. This is because according to Feige (1990: 990), "*all measurements require a theory and conceptual framework since measurement without theory is vacuous*". To better understand the OHS practices among auto-artisans, accident causation theories were reviewed to guide the study. Some of the theories which guided are the protection motivation theory, human factors theory of accident causation and the risk homeostasis theory.

Protection Motivation Theory

The study was guided by the Protection Motivation Theory (PMT) which postulates that fear can motivate individuals to modify their behaviour by engaging in protective activities. It is a theoretical model aimed at explaining the factors and processes involved in individuals' decisions on whether to engage in protective behaviours against potential threats or not (Wong, Gaston, DeJesus & Prapavessis, 2016; Gharaei et al., 2017; Rainear & Christensen, 2017; Westcott, Ronan, Bambrick & Taylor, 2017; Bai et al., 2018). The theory was proposed by Ronald Rogers in 1975 with later revision and additions in 1983 (Bai et al., 2018). The theory explains individual, social factors and cognitive processes involved in the decision to engage in protective behaviour (Rainear & Christensen, 2017). It predicts that the use of protective measures results from fear of a threat, a view supported by Pádua, Santos, and Horta (2013). Rogers (1975:100) further stated that attitudinal change is a function of the amount of protection motivation aroused by the cognitive appraisal of an individual, and incorporates a more complex psychological or rational choice making decision (Clubb, 2012).

The PMT has offered solutions in several different realms of enquiry since 1983, as predicted by Rogers (Westcott, Ronan, Bambrick & Taylor, 2017). It has been used in various fields such as public health, psychology, sociology and geography. For example, it has advanced the understanding of a number of behaviours, including alcohol consumption (Gibbons, Houlihan & Gerrard, 2010), and sexual risk behaviour for HIV infection (Cheng et al., 2010), adherence to outpatient rehabilitation (Grindley, Zizzi & Nasypany, 2008). It has also been

applied to examined cervical cancer screening (Bai et al., 2018); sedentary behaviour (Wong, Gaston, DeJesus & Prapavessis, 2016); pro environmental behavioural intentions (Rainear & Christensen, 2017); substance abuse and smoking (Yan et al., 2014), nutritional improvement (Gharaei et al., 2017) and protective behaviours against schistosomiasis (Xiao et al. 2014).

The theory consists of three primary components: a fear appeal, a cognitive mediating process, and an attitude change. The fear appeal consists of three types of information regarding potential threats: a) the magnitude of the threats potential effects, b) the probability that such a threat will affect the individual, and c) the efficacy of a recommended response in protecting an individual from a potential threat (Clubb, 2012; Rogers, 1975). In the current study the fear appeal which is represented by the fear of being involved in an occupational accident leading to workplace injury would influence or compel an auto-artisan to employ safety practices if the individual is of the belief that employing safety practices will protect him or her from workplace injuries.

The other component is the cognitive mediating process. An individual auto-artisan is expected to consider the information presented by the fear of accident and decide the extent to which the accident and injury would affect him or her. This assessment determines an individual's motivation to engage in safety practices as a response to the potential threat of accident. This will ultimately initiate the final part of the PMT model: intent to adopt a recommended protective response. When the perceived severity, perceived potential for exposure to the threat, and/or the perceived effectiveness of a recommended protective response

are high enough, an individual would be expected to have the motivation to engage in a protective response to the potential threat.

However, when the perceived injury or illness, perceived potential for exposure to accident, and/or the perceived effectiveness of a recommended protective action or response are low an individual auto-artisan would have little or no motivation to engage the protective response to the potential threat.

In 1983, Rogers revised his original theory to clarify and elaborate the processes involved in the decision to use protective measures, thus creating the current PMT model. This process begins with the provision of information from the environment and interpersonal interaction regarding potential threats and options for protective behaviour, commensurate with the fear appeals component of the earlier model. Next, the individual assesses this information through two processes: threat appraisal and coping appraisal. In the threat appraisal process, the individual balances the rewards of not engaging in a protective behaviour with the severity and vulnerability of a potential threat which in this case is workplace injuries and illnesses.

Fear arousal has a reciprocal effect with severity and vulnerability, each serving to perpetually increase the other (Clubb, 2012). The coping appraisal involves a balance of perceived efficacy of the protective response with the costs of such a response such as inconvenience, expense, and difficulty in acting (Al-Ghaith, 2016) (that is, the balance between the cost of employing safety practices and benefits derived from employing the safety practices by an auto-artisan). The results of these threat and coping appraisals lead to protection motivation (Clubb,

2012; Rogers, 1975).

In the field of OHS, a number of studies (Sakhvidi et al., 2015; Morowatisharifabad, Faryabi, Sardooei, Fallahzadeh and Sakhvidi, 2017; Moeini et al., 2018) have employed the protection-motivation theory and concluded on the importance of educational intervention on OHS for workers. Wanjiku (2017) has also used the PMT to study factors influencing the use of PPE among auto-artisans in Kenya.

Human factors theory of accident causation

The human factors model of accident causation refers to distracting effects on the worker by either internal or external factors (HSE India, 2016). As stated by Male (2003), human factors are likely to contribute to this problem on different levels including factors relating to individuals, the nature of the job, and the organisational factors. The premise here is that, human errors cause accidents. Thus, the human factors theory of accident causation attributes accidents to a chain of events ultimately caused by human error. It consists of three broad factors which lead to human error: overload, inappropriate response, and inappropriate activities (Reason, 2000; Reason, 2016).

According to Heinrich (1959), overload amounts to an imbalance between a person's capacity at any given time and the load that person is carrying in a given state. A person's capacity is the product of such factors as his or her natural ability, training, state of mind, fatigue, stress, and physical condition. The load that a person is carrying consists of tasks for which he or she is responsible and

added burdens resulting from environmental factors (noise, distractions, and so on), internal factors (personal problems, emotional stress, and worry), and situational factors. The state in which a person is acting is the product of his or her motivational and arousal levels (Donaldson, Corrigan, & Kohn, 2000; Reason, 2000; Reason, 2016).

According to the theory, inappropriate response and incompatibility relates to how a person's response in a situation can cause or prevent an accident. If the person detects a hazardous condition but does nothing to correct it, he or she has responded inappropriately. The incompatibility of a person's workstation regarding size, force, reach, feel, and similar factors can lead to accidents and injuries. The human factor theory of accident causation has been used to investigate aviation accidents (Shappell & Wiegmann, 2012).

This theory is of relevance to the current study because factors which have the potential of resulting in workplace injuries at Suame Magazine relate to the individual artisans and their characteristics, the nature of their work (how risky or otherwise the work is) and organisational factors existing at the workshops.

Risk homeostasis theory

The risk homeostasis theory hypothesises that there is a degree of risk which individuals are prepared to take (Wilde, 1987). The theory considers the expected benefits of risky behaviour alternatives, the expected costs of risky behaviour alternatives, the expected benefits of safe behaviour and the expected costs of safe behaviour. It also looks at the target level of risk in recognition of the

understanding that people do not try to diminish risk which is at the level of risk at which the net benefit is expected to peak (Wilde, 1998). For example, when Sweden changed from left-hand to right-hand driving in 1967, the intervention in the immediate led to a significant surge in perceived risk which exceeded the target level and was therefore followed by a cautious driving behaviour resulting in a major decrease in road fatalities (Rudin-Brown, Jamson & Boase, 2013).

Even though, the theory was developed to investigate road traffic safety, the mechanisms and strategies involved in risk homeostasis are universal have been found to be effective in different areas of risk and safety assessment and prevention (Wilde, 1998). For example, this theory has been employed to investigate lifestyle-related injuries and deaths (Wilde, 1982) such as injuries and deaths resulting from driving, work-safety practices and sports. Again, Sam (2012) agrees that in as much as the theory was originally developed to examine road safety, it can be applied to the study of OHS. Similarly, Lingard and Rowlinson (2005) have stated that the risk homeostasis theory has implication for engineering technologies at the workplace but cautioned that OHS managers at the workplace should address risk perception among workers together with engineering approaches. This is because according to Pádua, Santos, and Horta (2013) people engage in positive health practices and modifiable risk behaviours when they perceive that they are at risk.

Even though researchers such as Pless (2016) have criticised the Risk Homeostasis theory as being used as a cover-up by people who are opposed to safety measures, it is of relevance to the current study because to ensure safety at

the workplace, workers consider the expected benefit of alternatives to identified risky behaviour, the expected benefits of safe behaviour and the expected cost of risky or safe behaviour alternatives. The risk homeostasis, according to Neyens and Boyle (2006) provides insights into challenges facing decision makers in all areas including safety and concludes that if workers consider risky behaviour to be costly, they will be willing to adopt an alternative safety behaviour.

Conceptual framework

The study reviewed some frameworks on OHS to find one which suits the objectives of the study. These frameworks include the antecedents and outcomes of healthy workplaces by Kelloway and Day (2005). The model addresses two basic categories of social interactions at the workplace which are, positive interpersonal interactions among colleague workers, supervisors and clients as well as culture of support, respect and fairness. The model posits that health and safety at the workplace is based on workers' physical safety and health, involving workers in decisions on workplace safety and characteristics of the job and tasks assigned to employees. It identifies factors which determine safety workplaces to include safety work environment, work content and characteristics, culture of support, respect and fairness, and employee involvement and development.

The framework further suggests that the above factors lead to healthy workplace which in turn results in individual outcomes, organisational outcomes and societal outcomes. According to Kelloway and Day (2005) individual outcomes include psychological, physiological and behavioural strains on the

individual worker which leads to injuries and illnesses. Organisational outcomes are made up of low turnover, poor performance, low organisational reputation and poor customer satisfaction while societal outcomes include high national health care cost and the cost of government programmes.

The second framework which was reviewed is the framework for organising and directing future theory, research, and practice regarding health and well-being in the workplace. This framework developed by Danna and Griffin (1999). looks at the antecedents and consequences of health and safety at the workplace. The framework focuses on work setting, personality traits and occupational stress as the antecedents to occupational safety which affect well-being in the workplace which in turn have consequences for the individual and the organisation. Work setting, personality traits and occupational stress have the potential to lead to accidents and injuries at the workplace. The framework highlights the role of interventions such as training on OHS, and demonstrates their potential impact on the antecedent factors, health and well-being, and the consequential factors.

This framework is relevant to the current study because the intervention in the form of training on OHS provided by master artisans to new entrants and apprentices on workplace safety is predicted to influence awareness of hazards which in turn is likely to affect WTP for workplace safety and OHS practices such as use of PPE. Evidence has shown that artisans who received training on workplace safety experience less workplace injuries, and violate safety rules less

than those who have not received any training (Cavazza & Serpe, 2010; Boini, Colin & Grzebyk, 2017).

Even though the "antecedents and outcomes of healthy workplaces framework" and the "framework for organising and directing future theory, research, and practice regarding health and well-being in the workplace" are both relevant to the study of workplace safety, they are both limited in aiding to fully achieve the objectives of the current study. Both frameworks do not link the variables of interest (orientation, awareness, risky job, personal factors and organisational factors) to the outcome of interest (WTP for OHS services and OHS practices). The study therefore settled on the DEFENS Study Conceptual framework developed by Friese et al. (2015). The DEFENS framework (see Figure 1) has six main constructs-educational module, personal factors, knowledge, perceived risk, organisational factors and outcome. According to the DEFENS study framework, personal factors and organisational factors are moderators while educational module served as an intervention; knowledge and perceived risk are referred to as mediators and the outcome of interest is use of PPE.

The framework hypothesises that the intervention (which in the current study is orientation on workplace safety respondents received upon their admission as artisans) will likely lead to an increased awareness of safety practices and WTP for OHS. It will also increase perceived risk of job (Friese et al., 2015). This view is in line with an earlier study by Martin and Larson (2003)

and Geer et al. (2007) who established that safety practices (e.g. use of PPE) and perceived risk of job increase after an educational intervention.

Awareness and perceived risk further serve as mediators between the intervention and the outcome of interest which in the current study are WTP for OHS services and safety practices. Studies have shown that artisans who are aware of occupational hazards are more likely to employ safety practices in their work than those who are unaware of occupational hazards (Marahatta, Gautam, Paudel & Yadav, 2018; Budhathoki, Singh, Sagtani, Niraula & Pokharel, 2014).

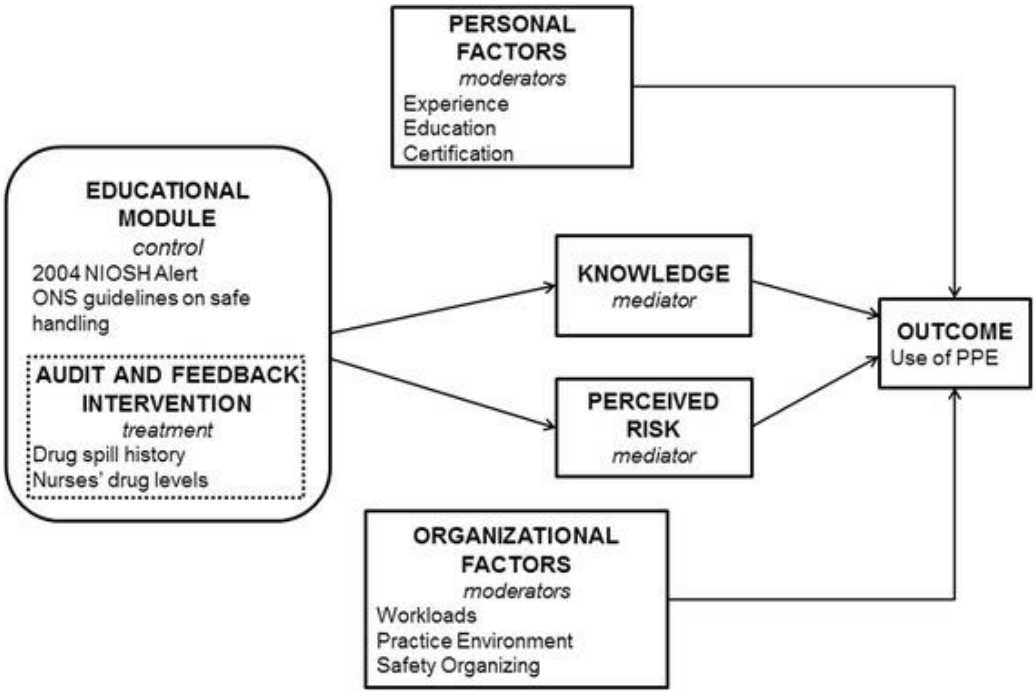

Figure 1: DEFENS Study Conceptual Framework
Source: Friese et al. (2015).

The framework further considers personal factors and organisational factors as moderators because they are likely to strengthen or weaken the effect of

the outcome, that is, WTP for OHS services and safety practices among artisans (Friese et al., 2015).

The DEFENS study conceptual framework was modified to incorporate variables relevant to the current study which are not found in the original framework (see Figure 2). For example, in the DEFENS study framework, the educational intervention is the one-hour web-based educational module on hazardous drug handling while the outcome of interest is use of PPE. In the modified framework, the educational intervention is the orientation in the form of training on workplace safety respondents received when they were admitted into apprenticeship and the outcome of interests are WTP for OHS services and safety practices.

Again, in the DEFENS study framework, personal factors are nurse experience, level of education and certification while in the conceptual framework employed for the current study, personal factors are age, level of education, occupational status, income, membership of association and experience. The framework for the current study has safety culture and priority of workplace safety as variables under organisational factors as against workload, practice environment and safety organising in the original framework by Friese et al. (2015). Safety culture has been described by Misnan and Mohammed (2007) as a set of beliefs, norms, attitudes, and social, practices concerned with minimising the exposure of individuals, within and beyond an organisation to conditions considered dangerous or injurious.

In the current framework, it is hypothesised that the educational intervention does not lead to increased awareness of workplace hazards and perceived risk of job. It is hypothesised again that awareness and perceived risk would not mediate between the intervention and the outcome which are workplace safety practices and WTP for OHS services. Furthermore, it is hypothesised that there is no statistically significant relationship between personal and organisational factors and the outcome of interest (WTP and safety practices).

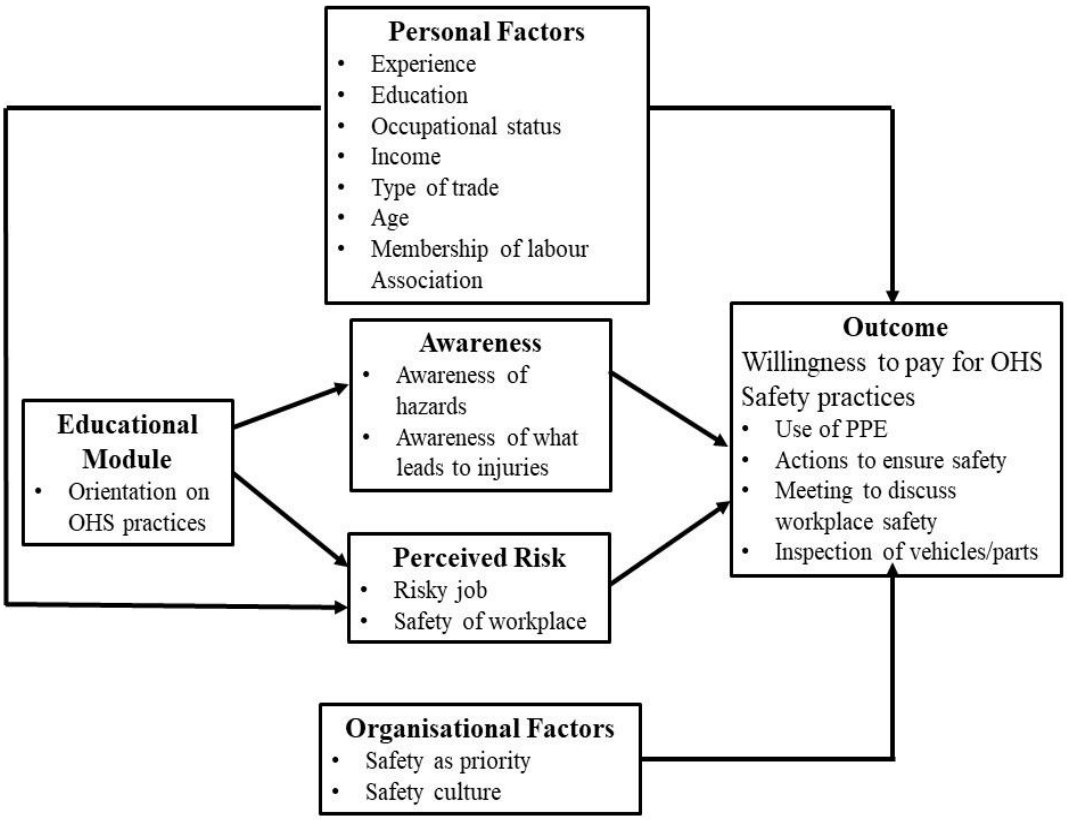

Figure 2: Conceptual framework for the study of OHS among auto-artisans

Source: Adapted from DEFENS Study Conceptual Framework: Friese et al. (2015) with permission from Friese.

Summary

The chapter focused on the theoretical and conceptual issues related to OHS. The chapter discussed the definition of concepts such as occupational health, workplace injuries, causes of occupational injuries and illnesses, WTP for occupational health services. hazards, safety, and risk. The chapter reviewed international conventions on OHS as well as acts governing workplace safety in Ghana concluding that Ghana has no policy on the occupational safety of the informal sector. Various theories and models of OHS including the Domino theory of accident causation, Human factor theory of accident causation, Accident/incident theory of accident causation and the System theory of accident causation are also discussed in this chapter. A number of conceptual frameworks including antecedents and outcomes of healthy workplaces framework and the DEFENS Study conceptual framework were also reviewed. The DEFENS Study conceptual framework was finally selected for the study. This is because of its advantage over the others reviewed. The DEFENS Study conceptual framework is capable of helping the study to achieve the set objectives.

CHAPTER THREE

REVIEW OF EMPIRICAL LITERATURE ON OCCUPATIONAL HEALTH AND SAFETY

Introduction

This chapter discusses empirical issues on OHS. It examines literature related to OHS. Issues discussed include the role of employers and workers in ensuring workplace safety, causes of occupational injuries and illnesses, nature and type of occupational health among artisans, OHS management in Ghana, awareness of OHS hazards and use of PPE. The chapter also looks at the importance of OHS as well as WTP for OHS services at the workplace. It further examines the causes of occupational injuries and illnesses as well as workplace fatalities. The chapter ends with discussions on the cost of OHS and workplace fatalities.

Ensuring workplace safety: The role of employers and workers

Workplace safety is the responsibility of both employers and employees. The former has much responsibility in successful management of occupational safety and health at the workplace. For example, the 1989 Framework Directive (89/391/EEC) of the European Commission has placed greater responsibility of general assessment of risks involved in workplace health and safety on the door-step of the employer. This is because it is believed employers know and control the work processes and are therefore in the best position to identify and control workplace hazards (van Stolk, Staetsky, Hassan & Kim, 2012). As a result,

employers generally have the duty of ensuring that the health and safety of every employee is protected while they are at work (Adeneyi, 2010). The Labour Act 2003 (Act 651) of the Republic of Ghana (2003) section 118(I) for instance states that it is the duty of an employer to ensure that every worker under the organisation works under satisfactory, safe and healthy conditions (Adei & Kunfah, 2007). Adu-Amankwah (2007) is of the view that an essential aspect of the role of the employer is to engage in risk management processes at the workplace. Risk management system/process, according to Adeneyi (2010), is a system which identifies the OHS risks that are relevant to a workplace. It involves identifying hazards, assessing risks, controlling the risks and reporting accidents that occur.

Globally, employers have the obligation to ensure that employees are protected from all health hazards that they may be exposed to, which will in turn pose threats to their health and safety. Safety hazards, as noted by Alfers (2012), are those aspects of work environment that have the propensity of violent harm to the employee. Socially responsible employers across the globe always put in place, active health and safety mechanisms prior to the occurrence of any hazard. However, some employers or management, comply with safety measures, only when hazards have already been recorded (Burton, 2010). Aworemi, Abdul-Azeez, Adewoye and Oyedokun (2009) argue that all employers, whatever the size of the organisation, play the role of ensuring that they make the workplace safe, prevent risks to health, ensure that plant and machinery are safe to use, ensure safe working practices are set up and followed. Employers are also

mandated to make sure that all materials are handled, stored and used safely, provide adequate first aid facilities, inform employees about potential hazards from the work and give them information, instructions, training and supervision as needed to avoid safety hazards (Aworemi et al., 2009). To ensure workplace safety, employers are obliged to provide the right work equipment and to make sure they are properly used and regularly maintained, to prevent or control exposure to substances that may damage the health of employees. They are also obliged to take precautions against the risks caused by flammable or explosive hazards, electrical equipment, noise and radiation, and also avoid potentially dangerous work (Aworemi et al.).

Employers, irrespective of their location, according to Atim, Fleisher, Hatt, Masau and Arur (2009), must ensure workplace health and safety, by providing adequate supervision, protective clothing and equipment to workers, and ensuring that the right warning signs are provided and looked after, to avoid hazards. OHS in Ghana is backed by the Labour Act, 2003 (Act 651). Section 113 (1) (b) stipulates, among others functions that the tripartite committee is to "advise on employment and labour market issues, including labour laws, international labour standards, industrial relations and occupational safety and health".

Section 118 (1) of Act 651 places a responsibility on the employer to ensure that his employees work under satisfactory, safe and healthy conditions. Subsection (2) of Section 118 specifies that: Without limiting the scope of subsection (1), an employer shall provide and maintain at the workplace, plant

and system of work that are safe and without risk to health as well as ensure the safety and absence of risks to health in connection with use, handling, storage and transport of articles and substances. Act 651 again mandates the employer to provide the necessary information, instructions, training and supervision having regard to the age, literacy level and other circumstances of the worker to ensure, so far as is reasonably practicable, the health and safety at work of those other workers engaged on the particular work and take steps to prevent contamination of the workplaces, and protect the workers from toxic gases, noxious substances, vapours, dust, fumes, mists and other substances and materials likely to cause risk to safety or health.

The employer must also supply and maintain at no cost to the worker adequate safety appliances, suitable fire-fighting equipment, PPE, and instruct the workers in the use of the appliances and equipment. Sub section (2) of Section 118 of Act 651 also requires the employer to prevent accidents and injury to health arising out of, connected with, or occurring while work, by minimising the causes of hazards inherent in the working environment Labour Act, 2003).

Much responsibility has been placed at the doorstep of the employer in ensuring workplace safety. However, worker participation in health and safety plays a major role in contemporary national approaches designed to improve health and safety management. Being the ones exposed to risks, workers are in a better position to appreciate the source of health hazards or accidents occurring at their workplace (Walters, Nichols, Connor, Tasiran & Cam, 2005; Baruah 2014). The European Agency for Safety and Health at Work (2011) is of the view that

employees' involvement in health and safety matters is a two-way process. First, employers and their worker representatives must speak to one another, listen to each other's concerns, share information, discuss pertinent issues, take decisions together and share a relationship of trust and respect. Secondly, employers should involve workers in all discussions pertaining to workplace health and safety (Baruah, 2014).

The worker responsibilities at ensuring workplace safety include reporting hazards in the workplace; working safely and following safe work practices and using the required PPE for the job at hand. He or she is also enjoined to participate in health and safety programmes established for the workplace. Again, every worker must protect his or her own health and safety by complying with the law and with safe work practices and procedures set out by the employer (Ontario, 2015). It should be noted that the obligations to ensure and implement OHS measures at the workplace are not the responsibility of the employers alone. It is required that workers cooperate in ensuring safe workplaces by taking part in training courses offered by management or employers, cooperation of workers and their representatives in workplace safety decision making is essential in workplace safety (European Commission, 2011). For example, paragraph 1 of Article 13 of Directive 89/391/EEC of the European Economic Community states that: "It shall be the responsibility of each worker to take care as far as possible of his own health and safety and that of other persons affected by his acts or omissions at work in accordance with his training and the instructions given by his employer." Article 13 of Directive 89/391/EEC therefore places a significant

responsibility on workers regarding workplace safety. In Australia for example, workers are entreated to take a reasonable care of their own health and safety at the workplace. They are also to avoid endangering the health of others through their actions or inactions (WorkSafe Victoria, 2004).

In Ghana, sub-section (3) of the Labour Act, 2003 (Act 651) compels every worker to use safety appliances, fire-fighting equipment and PPE provided by the employer in compliance with the employer's instructions. Sub-section (4) of the Act further absolves the employer of liability for injury suffered by a worker who contravenes the provisions of subsection (3) where the injury is solely due to non-compliance of the worker. The Act therefore makes it the responsibility of the worker to as much as possible protect himself from harm at the workplace by following all safety regulations in place at the workplace. To ensure adequate workplace safety, the worker is further mandated and expected to report hazards, injuries and unsafe working conditions to supervisors or management. In situations where hazards are reported to supervisors and no proper action is taken the worker can report to safety representative or committee member (Ministry of Health/Ghana Health Service, 2010; Safety Matters at Work, 2011). Workers are obliged to use protective clothing, devices, and equipment provided by the employer. They are again entreated to perform work in a safe manner and not engage in work while impaired by alcohol, drugs, or other causes. Workers are also mandated to participate in all activities to ensure workplace safety and be given the opportunity to express their views on workplace safety (Baruah 2014).

From the above, it can be observed that both employers and workers are to collaborate fully in ensuring workplace safety. However, most employees believe their employers should be solely responsible for creating a healthy working environment devoid of injuries and illnesses at the workplace (Hu, Lee, Shiao & Gua, 1998).

Causes of occupational injuries and illnesses

The ILO estimates suggest that about 2.2 million workers die every year from work related ill-health and injury. Three hundred and fifty thousand (3500) of these deaths result from accident while the rest are due to workplace illnesses and diseases (Pearson, 2009). There are varied opinions in the literature concerning the causes of workplace accidents, injuries and illnesses. Muchemedzi and Charamba (2006) are of the view that accidents do not occur from a single cause but from a combination of factors acting simultaneously. According to them a potentially unsafe situation does not result in an accident until someone is exposed to it. Accidents are therefore caused by the result of unsafe situations, exposure and acts or practices by humans. Citing other authors (Crawford et al., 1998; Choi et al., 2005; Girard, et al., 2009; Hymel et al., 2011) posit that hearing loss and poor eyesight are major conditions associated with injuries at the workplaces.

However, Cheng, Leu, Lin and Fan (2010) are of the view that factors which contribute to accidents in the workplace include lack of value of the importance of safety measures employed at workplaces, insufficient safety

education to newly employed workers and management failure to hire well-trained safety and health personnel to implement safety measures at workplaces. They concluded from a statistical analysis of 1,347 occupational accidents and fatalities that both workers and management are aware of safety issues and potential hazards. However, most workplace accidents leading to injuries were found to occur due to management's failure to implement adequate and appropriate safety measures to protect workers against potential hazards in the working environment and unsafe acts committed by workers.

Another major cause of workplace accident leading to injuries is stress which is most often results from work demand (Kodom-Wiredu, 2019). Burton (2010) is of the view that stress is a significant factor which causes workplace injuries leading to fatalities and loss of working hours. Basing his argument on the American Institute of Stress Traumatic model, Burton (2010) concludes that workplace induced stress or stress resulting from other factors affects an individual's performance at work causing performance impairment which results in errors at work. The error will lead to accidents which will cause injury or death. This assertion is supported by Johnson (2008) who argues that anxiety, stress and neurotic disorders are the most common non-fatal injuries and workplace disorders more than all other non-fatal injuries combined. Cifuentes et al., (2008) and Yamasue, Hayashi, Ohshige, Tochikubo and Souma (2008) have also observed that workers engaged in occupations that are often subjected to rigid and irregular time schedules and associated heavy workload are typically found to experience hypertension and high levels of stress and mental illnesses and that a

decrease in overtime work hours can improve mental health among workers (Hino, Inoue, Mafune & Hiro, 2019). The varied views expressed on the causes of workplace injuries are an indication that a holistic study on the causes of occupational injuries and illnesses has not been done at all levels of employment within the formal and informal economies of the world.

Nature and type of occupational health and safety among artisans

Vehicle repair artisans have a greater risk of sustaining serious workplace injuries through body piercing injury where the injured person could be absent from work for more than ten days (WorkSafe Victoria, 2004). The most common type of injuries among artisans in automotive workshops is manual handling injuries. Such injuries result from carrying heavy or awkward objects, lifting heavy objects (engines, radiators, gearboxes, transmissions, mufflers) and from prolonged or sustained work in awkward postures. This injury trend occurs across all types of vehicle repair, maintenance and or installation work, and on all types of vehicles (WorkSafe Victoria, 2004). Given the nature of work involved in automotive repair and maintenance, there is always the risk of severe injury or fatality. Some risks associated with automotive repair work such as vehicles falling from hoists and jacks, being hit by a passing vehicle while working on the road side, or tyre explosion during inflation are obvious. However, others such as long-term inhalation of asbestos fibre or fumes from solvents and automotive paints are less obvious and preventable (WorkSafe Victoria, 2004).

Occupational health and safety management in Ghana

Safety management according to Benjaoran and Bhokha (2010) is a set of actions or procedures relating to health and safety in the workplace. It comprises three key tasks namely hazard identification, safety measure planning, and control. According to Safety Matters at Work (2011) there is evidence to show that some workplaces have a high rate of injuries while others, with similar work have none or less. The difference has been identified in how workplace health and safety plans are managed in various workplaces.

Occupational health and safety management in Ghana is a process which constitutes a core management function (Dwumfour-Asare & Asiedu, 2013). Its success necessitates management commitment to health and safety, professional freedom of the service, privacy and consultation among management and workers. According to Quansah (2008), OHS management entails, managing the mental, social and physical welfare of workers, and for that matter the whole person. The working capability of a labour force sustains the material and economic base of a society. OHS of workers are thus vital pre-requisites for productivity and is of importance to socio-economic and sustainable development (Adei, Adei & Osei-Bonsu, 2011).

At minimum, seven percent of Ghana's GDP is expended on resolving problems associated with the inappropriate management of health and safety (Adjotor, 2013). According to Monney, Dwumfour-Asare, Owusu-Mensah & Kuffour (2014) the safety of workers against work-related injuries and illnesses has over past decades, been a subject of pronounced distress to workers,

employees, governments, and the entire populace in Ghana. This is because a safe working environment does not only promote the mental, physical, and social well-being of workers, but also saves cost associated with work interruption, medical bills, compensation, loss of experienced personnel (Monney et al., 2014).

In Ghana, regulations which seek to address issues regarding management of the OHS of employees at the workplace are fragmented. There is the Labour Act 2003 (Act 651), the Factories, Offices and Shops Act 1970 (Act 328) and the Workmen's Compensation Law 1987 (PNDC Law 187) (Dwumfour-Asare & Asiedu, 2013; Adei et al., 2011; Adei & Kunfaa, 2007). The execution of these laws is fraught with numerous challenges including loopholes in existing laws guiding OHS management (Ametepeh, 2011; Cudjoe, 2011).

According to Lambert (2005), when there is an effective management of the safety of the work environment, there is the tendency to increase productivity beyond the initial observed level (Fartasch, Diepgen, Schmitt & Drexler, 2012). Policy level initiatives in health and safety management and the advancement of workers' health are relevant, especially those are initiated through increased stakeholder involvement within frameworks such as collective agreements and enterprise responsibility (Leka, Jain, Iavicoli, Vartia & Ertel, 2010). This will lead to compliance of safety regulations. According to Park (2018) businesses usually comply with health and safety regulations when they have experienced occupational injuries in preceding years.

Institutions such as the Trades Union Congress exist in Ghana with the objective of taking health and safety initiatives and establishing employee unions

within organisations to improve the quality of working life of employees (Fartasch et al., 2012; Adei & Kunfaa, 2007). These institutions, often, protect workers who refuse to accept hazardous tasks, and offer support and representation for workers in accident compensation claims (Dartey, Adimado & Agyarko, 2010).

Awareness of OHS hazards

The application of health promotional measures at workplaces (especially among artisans) is an essential step towards providing a healthier workplace, especially in developing countries where such measures are generally not well considered. Although in developed countries awareness and regulatory measures to adhere to safety precautions exists, same cannot be said of many developing countries (Kumar, Dharanipriya & Kar, 2013). However, awareness of occupational hazards and its safety precautions among artisans is an important health issue which needs to be addressed, especially in developing countries (Kumar et al., 2013). Awareness of occupational safety and health play an important role in the prevention of injuries and diseases at the workplace (Manuel, Daphnie, D'cunha & Suresh 2015).

The understanding of occupational exposure is important for all exposed individuals; nonetheless, many workers are not aware of potential hazards present in their workplaces making them more vulnerable to injuries and diseases (Pui et al., 2017; Tam & Fung, 2008). Research findings have identified knowledge gaps of potentially harmful workplace exposures and that awareness differed

substantially across different occupations and exposures (Pui et al., 2017). Some studies have found high level of knowledge and awareness while others found otherwise. The awareness of occupational health hazards tends to be high among some workers in the informal economy. For instance, Budhathoki et al. (2014) found that awareness of occupational hazards and use of safety measures among welders was high; specifically, 90.7% of welders were aware of at least one hazard of welding.

In a similar situation, Kumar et al. (2013) suggested that artisans (mainly welders) are more aware of occupational hazards than safety measures and practices. A study conducted by Diwe et al. (2016) in South Eastern Nigeria also concluded a high level of awareness of occupational hazards among timber workers, a situation they explained to be due to the level of education attained by respondents and the length of work experience. Relatedly, Tadesse et al. (2016) found high (86.5%) awareness level of occupational hazards and its associated factors among welders. They further concluded that the awareness level was significantly associated with work experience, presence of well-defined work regulation, job satisfaction, marital status and the attainment of higher education.

Similarly, Awosan et al. (2017) observed that almost all the respondents in their study had knowledge of OHS. Their findings were not different from those by Pui et al. (2017) that study participants were aware and concerned about their exposure to diesel exhaust but had incomplete and sometimes incorrect understanding of the exposure pathways, health effects, and effective strategies to reduce their exposures to the diesel exhausts. Manuel et al. (2015:42) in a study

on awareness of hazards in the laundry department of a hospital in Karnataka, India found that 53.3 percent of the respondents were aware of the falls which could occur due to their profession, 93.3 percent were aware of hearing problems, and 20 percent showed awareness of headaches. In relation to chemical hazards, 93.3 percent of them were aware of latex allergy as a hazard, 26.6 percent mentioned dermatitis while 13.3 percent were aware of respiratory problems as occupational hazard occurring due to their profession.

Despite the high level of knowledge found in some studies, others have recorded low level of knowledge and awareness among workers. For example, lower level of knowledge and awareness was found among welders in Nigeria by Isah and Okojie (2006) compared to the previous studies reviewed. Hassan, Nasir, Anwar and Talib (2018) also reported a prevalence of lack of awareness among the welders in Pakistan regarding the health risks and safety hazards associated with their trade. The study showed that as much as 45.7 percent of the respondents indicated that there is no major risk to their health in the welding profession. Budhathoki et al. (2014) found that a gap exists between being aware of workplace hazards (90%) and use of PPE (47%) at work. With reference to socio-demographic characteristics, Budhathoki et al. (2014) found a positive association between level of education and awareness of hazards among the welders in Nepal indicating an increase in awareness with higher education. However, they found that number of years spent as an artisan was negatively associated with awareness of hazards, a finding which is not supported by the conclusion of Tadesse et al. (2016) which suggests a significantly positive

relationship between work experience and awareness of workplace hazards. Tadesse et al. (2016) also found marital status and educational level to significantly relate to awareness of workplace hazards. Awareness of workplace hazards was associated with age among Indian sand and stone miners in (Ahmad, 2017). A similar situation was reported by Onowhakpor, Abusu, Adebayo, Esene, and Okojie (2017) who aver that knowledge of occupational hazards increases as one advances in age among respondents of saw mill workers in Nigeria.

The plausible explanations to the discrepancies among the various study findings could be due to methodological differences, such as study population, definitions of hazard awareness, methods of data collection, and workplace conditions as well as the differences in the times the studies were conducted.

Awareness of safety practices

Several studies have been conducted across the world on the awareness of safety practices. For example, in Nepal, Marahatta et al. (2018) studied the awareness of occupational hazards and associated factors among automobile repair artisans in Kathmandu Metropolitan City. They found that 56 percent of those who were aware of occupational hazard were literate.

Joseph et al. (2017) conducted a study to assess awareness of occupational hazards and usage practices of protective gears among welders. The study, which was cross-sectional found that awareness of occupational health hazards was fairly associated with welding (62.6%). Syed, Ahmed, Akram, Qureshi, and Shakoor (2010) conducted a study on welding and its associated ocular injuries. It

was revealed that their knowledge of safety measures was satisfactory.

Similarly, awareness of occupational hazards among auto-artisans have well been documented in countries such as Nigeria, Zambia and India. The studies further revealed that work experience, employment pattern, marital status, educational status, job satisfaction, safety training, supervision and work regulation showed significant association with awareness. (Eze, Okoye & Aguwa, 2015; Adewoye et al., 2014; Kumar et al., 2013; Awosan et al., 2017, and Tadesse et al., 2016).

Adewoye et al. (2014) on the other hand posit that educational intervention has a positive relationship with awareness and use of PPE. In their study on the effect of educational intervention on awareness and use of PPE they found that 97.9 percent of artisans reported that educational intervention has impacted positively on their awareness of the use of eye goggles as a means of protection. However, Abraham, Megbelayi and Akpan (2015) reported that 78% percent of artisans studied claimed they had never heard about protective eye wear at work.

Use of PPE

The use and adoption of PPE plays a very crucial role in minimising exposure to workplace accidents and health problems (Johnson & Motilewa, 2016). Several studies have been conducted on the use and adoption of PPE. As some of these results present low use of PPE, others also revealed high level of usage of PPE. A study in Uganda conducted by Izudi, Ninsiima and Alege (2017),

for instance, found that only 15.6 percent of the respondents used PPE. Similarly, low level of usage was also observed in Nigeria by Johnson and Motilewa (2016). They found that 27.8 percent of the respondents used PPE the most utilised PPE being overalls (78.8%).

In Nepal, Marahatta, Gautam, Paudel and Yadav (2018) studied awareness of occupational hazards and associated factors among automobile repair artisans in Kathmandu Metropolitan City. It was found that 44.3 percent of artisans were using the PPE. Budhathoki et al. (2014) found similar results in Nepal who studied the awareness of occupational hazards and use of safety measures among artisans. It was found that 34.2 percent of the respondents used one or more types of protective device with eye goggles (60.9%), hand gloves (50.3%) and boots (34.5%) being more frequently used.

Artisans involved in welding, spray painting and metal work in Dar es Salaam, Tanzania, showed low use of PPE (Rongo, Barten, Msamanga, Heederik & Dolmans, 2004). Fiebai and Awoyesuku (2011) also showed in Port Harcourt that 15.3 percent of welders used protective eyewear. Similarly, a study carried out in Al Khobar, Saudi Arabia, also reported low use of PPE (Taha, 2010). In Nigeria, Johnson and Motilewa (2016) found that only 27.1 percent of auto technicians used PPE.

In the same vein, Ihekaire and Oji (2017) also found that only 2 percent of respondents claimed to constantly use eye-wear, 14 percent (often users) and 41 percent (occasional users). In Ghana, Monney et al. (2014) showed that less than a third (27%) of the artisans interviewed in Asante Mampong were observed to be

using PPE during their work**.** Moreover, a similar study carried out to assess the occupational chemical hazards perceptions, safety practices and their enforcement in Kumasi, reported that only 0.7 percent of the respondents reported always using appropriate PPE during spray painting process (Adei et al., 2011). Relatedly, in Nigeria, Abraham, Megbelayi and Akpan (2015) found that ninety-five subjects (87.2%) were not wearing any form of eye protection at work.

However, high level of utilisation of PPE was found in some studies. For example, Amani, Bahadoram and Hazrati, (2017) reported that**,** 86 percent of welders used protective glasses. In India, Kumar et al., (2013) found that the majority (95.7%) of studied welders utilised at least one protective measure in the preceding week. Megbele, Lam, and Sadhra (2012) did a study on the risks of cataract in Nigerian metal arc welders and found that 60 percent of the welders used eye protection equipment. Similarly, Adei, Braimah and Mensah (2019) found that PPE use was low among fish mongers in Subin Sub-Metro in Kumasi

Cost of occupational injuries and illnesses

Work-related injuries, illnesses, impairments and deaths perpetrate high costs on employers, workers and society as a whole (Safe Work Australia, 2012; European Commission, 2011). It is documented that employers do not record many work-related injuries and diseases therefore the actual number of workers injured each year is likely to be far higher than what the estimates provide (Boden & Ozonoff 2008). Estimating the burden of work-related illnesses and diseases is complicated by the fact that many chronic illnesses occur many years after

exposure has ended and are generally not identified as work-related (Michaels, 2015). Improved information about these impacts is important both to defining priorities for research and for developing policies aimed at prevention of diseases, injuries, and disabilities (Boden, Biddle, & Spieler, 2001).

Cost of occupational injuries and diseases can be categorised into direct and indirect cost (Leigh et al. 2000; Mendeloff & Staetsky, 2014). Leigh, Macaskill, Kuosma and Mandryk (1999) suggest that the categorisation into direct and indirect costs illuminates some underlying effects of OHS. While Leigh et al. (2000) describe direct costs as cost which is insured and easily quantifiable, Safe Work Australia (2012:9) classifies direct costs to include workers' compensation premiums paid by employers or payments to injured or incapacitated workers from workers' compensation groups. Indirect costs on the other hand are considered as the lost opportunities of the injured employee, his family, the employer, co-workers, and the community and government (Leigh et al., 2000). In the view of Safe Work Australia (2012:9) indirect costs are the lost productivity, loss of current and future earnings, lost potential output and the cost of providing social welfare programmes for injured or incapacitated workers. Such costs are not directly related to the treatment and repair of the injury. In contrast to direct costs, indirect costs are usually intangible in nature. This means they are much more difficult to calculate. A major indirect cost of workplace injuries and illnesses is loss of working hours. However, indirect costs of workplace injuries and diseases have been estimated to be 2.7 times that of direct cost (Leigh, 2011). In the EU-15 Member States 150 million man-days are lost

each year due to accidents at work and an estimated 350 million injuries occurring annually due to other health problems caused by work. Similarly, 31.2 million days are lost yearly due to health and safety incidents in the United Kingdom in 2016/2017 (Health and Safety Executive, 2018).

Workplace fatalities

Issues relating to OHS have not been given prior attention in the sustainable development agenda of many nations particularly those in the developing world where most people are engaged in primary and informal economic activities such as agriculture, logging and mining (Amponsah-Tawiah & Dertey-Baah, 2011). This inadequate attention has resulted in an increase in workplace fatalities globally. For instance, Hamalainen et al. (2006) have indicated that more than 54,000 fatal occupational accidents happen annually in Sub-Saharan Africa countries amounting to a fatality rate of 21 deaths per 100,000 workers for the region. This is out of an accident rate of 16,000 per 100,000 workers. Hamalainen et al. (2006) again argue that out of 9 million workplace accidents which occurs in Ghana annually, it is estimated that 1852 fatalities are recorded giving a fatality rate of 20.6 percent.

Importance of occupational health and safety

Work provides economic and other benefits to the worker, the immediate family and community. A wide range of occupational hazards however present risks to the health and safety of the work (European Commission, 2011). These

include, biological agents, chemicals, physical factors, adverse ergonomic conditions, allergens, a complex network of safety risks, and a broad range of psychosocial risk factors. As such, the European Commission (2011) argued that workers should be made aware of the benefits of adopting safe working practices in terms of reduced hazards.

The importance of OHS to organisational management cannot be over emphasised. Effective management of the OHS of workers helps them to live longer and happier lives, and reduce the costs associated with illness and injury on the workers and their communities (Bennet, 2011; Cudjoe, 2011; Adjotor, 2013). According to the European Commission (2011), OHS issues form an important component of quality management, risk management and corporate social responsibility of every organisation. It should therefore, be an integrated element of all managerial development processes.

A growing body of research demonstrates the link between improved health and functional status of the worker, worker productivity, and lowered total costs of production which inures to the benefit of the employer. Goetzel et al. (2007) are of the view that well-designed health programmes in the workplace could achieve long-term health and productivity improvements among workplace populations which will eventually lead to higher productivity. To Tadesse and Admassu (2006), providing healthy and safer environment is beneficial to workers, employers and governments, as well as the public in general. Therefore, good occupational safety and health practices, as noted by Levy, Wegman, Baron and Sokas (2011), significantly reduce employee injury and illness related costs,

including medical care, sick leave and disability benefit costs, resulting from occupational hazards (Tanko, Molnar, Fulesdi & Molnar, 2014). Safety Matters at Work (2011) also shares this view and states that, workplaces with good communications and functioning safety programmes have the potential to reduce injuries and illness, as well as better quality and production rates.

Similarly, a Harvard analysis on costs associated with prevention programmes in the workplace found that medical costs were reduced by $3.27 and absenteeism costs were reduced by $2.73 for every $1.00 spent on comprehensive workplace wellness and prevention programmes (Baicker Cutler & Song 2010). In a study by Finkelstein, DiBonaventura, Burgess and Hale (2010) it emerged that employers could achieve significant savings by reducing the prevalence of obesity. This finding confirms an earlier study by DeVol, Bedroussian and Charuworn (2007) which concluded that lowering obesity rates among workers leads to productivity gains of $254 billion and avoidance of $60 billion in treatment expenditures.

Workplace injuries and illnesses lead to absenteeism and presentism which result in low productivity and high cost of productivity (Adjotor, 2013; Grinza & Rycx, 2018; Nagata et al., 2018). Therefore, when workplace injuries are reduced it will lead to increased productivity which is of great importance to the employer, especially in countries where there is a shortage of skilled labour (Tadesse & Admassu, 2006). There will be a reduction of wage losses and decreased compensation costs paid by employers to workers due to injuries at the workplace. Effective workplace safety management will also result in the

reduction of absenteeism and presenteeism and therefore leading to retention of skilled labour (ibid). In this wise, Funmilayo (2014) argues that managing workplace safety is as important for the company, employers as much as it is for the employees.

Healthy workers, as noted by Tanko et al. (2014), increase industrial output and lower the costs of production and through their incomes; they can contribute to the health of their families and their communities. Workers constitute a large sector of the population of every nation. It is therefore not possible for any country to survive when its labour force is weak and ill, from occupational hazards that they are exposed to at their places of work (European Commission, 2011).

Workplace safety is also important to the business organisation. In the view of the Royal Society for the Prevention of Accidents (2014) ensuring workplace health and safety is not just a social responsibility, it also makes good business sense and must be regarded as important as the achievement of any other key business objective. According to Burton (2010) creating healthy workplaces which does not harm the mental or physical health, safety or well-being of workers is important for the business argument. Tung, Chang, Ming and Chao (2014) are also of the view that safety at the workplace improves the maintenance and promotion of workers' health and working capacity and creates positive social climate and smooth operation at the workplace.

Willingness-to-pay for OHS services

WTP is defined as the maximum price a consumer accepts to pay for a given amount of goods or services (Kohli & Mahajan, 1991; Wertenbroch & Skiera, 2002; Gall-Ely, 2009). The WTP for OHS on the other hand is described as "*the amount that an individual or society is willing to pay or receive in exchange for a marginal change in risk-injury, disease, or death"* (Lebeau & Duguay 2013:25). According to Gall-Ely (2009), research on WTP has developed at a fast pace in recent years despite the limitations of using this concept which includes the methods for its measurement. Measuring WTP is affected by biases resulting from over-estimation or under-estimation. Another limitation of the concept is that its measurement is only valid within a particular time in a given environment. According to the expectations-disconfirmation paradigm (Oliver, 1980), consumers of a product or service formulate an evaluation judgment by comparing expectations shaped before consumption with the perceived performance of the product or service. Several studies have explored the links between satisfaction and WTP. Thus, for consumers to accept to pay for OHS services, they first evaluate the benefit to be derived from the services to be provided or the satisfaction level of the service before deciding. In the view of Homburg, Koschate and Hoyer (2005) there is a link between WTP and satisfaction which evolves over time.

The Transaction utility theory developed by Thaler (1983) links the concepts of reference price and WTP to utility. The theory explains further that when a "buyer evaluates a transaction, three price concepts come into play: the

proposed price of the product, the WTP and reference price of the buyer" (Gall-Ely, 2009:97). Monroe (1979) describes the concept of reference price as the price against which buyers compare the offered price of a product or service. He explains further that reference point can be internal, referring to the price in the buyer's memory or external indicating the price of an alternative product.

A major factor which influences WTP is the means of payment and the type of pricing. Prelec and Simester (2001) suggest that consumers who pay by credit card are likely to have a higher WTP than those who pay with cash. This assumption is highly practicable in economies where credit card is commonly used as a means of payment for goods and services but not in informal economies in developing countries such as the Suame Magazine enclave where cash payment is the order of everyday transactions. Contributing to factors influencing WTP, Jedidi, Jagpal and Manchanda, (2003) posit that packaging of a product or service has the potential of influencing WTP while Krishna (1991) is of the view that the frequency of promotion and advertising is important in WTP. He explains further that in cases where the perceived incidence of promotions for a commodity is strong, WTP is high. It is therefore important to state that how OHS services are well packaged and advertised has the potential of influencing its acceptability by the intended consumers.

Gaps in literature

1. A major gap identified in the literature is the paucity of research on the different auto-artisanal trades in Ghana and Suame Magazine in particular.

No study was found in the literature which has profiled all the auto-artisanal trades at the Suame Magazine enclave or any other auto-artisanal cluster in Ghana.

2. Research on the Suame Magazine enclave has been on piece-meal bases with studies touching only on known auto-artisanal trades such as welding, spraying and blacksmithing and also on specific health conditions. There has not been enough research involving all auto-artisanal trades at the enclave.
3. Another gap identified in the literature is that the effect of orientation on OHS has not been investigated among auto-artisans in Ghana.
4. WTP for occupational health and safety service has not been investigated in the informal economy in Ghana more especially among auto-artisans. Available data on WTP are on water, environmental resources and energy. Again, research on WTP does not often reflect the views of artisans in developing countries such as Ghana and more particularly, among auto-artisans in the Suame Magazine. This therefore calls for a study on the WTP for occupational health and safety services by auto-artisans at Suame Magazine.

Summary

This chapter discussed relevant empirical issues on OHS such as the role of employers and workers in ensuring workplace safety, causes of occupational injuries and diseases, nature and type of occupational health among artisans, OHS

management in Ghana. Awareness of OHS hazards, workplace hazards, training and use of PPE were also presented in this chapter. The chapter again looked at the importance of OHS, economic, medical and social\al cost of OHS as well as WTP for OHS at the workplace. The chapter concludes with a discussion on gaps in literature relating to occupational health and health issues among artisans at the Suame Magazine enclave.

CHAPTER FOUR

METHODOLOGY

Introduction

The chapter is centred on the methodological approach to the study which includes the philosophy underpinning the research and attempt to justify the adoption of both qualitative and quantitative methods for data collection and analysis, study design, methods for data collection and analysis. The chapter also covered the criteria for the selection of Suame Magazine in Kumasi as the study area, the processes before and after the field work, and the type of data collected. The reliability and validity, the ethical issues involved and the limitations of the study are discussed.

Research philosophy

The study was guided by the positivist approach in social science research. The positivists approach was employed as the main approach for this study because the study sought objectivity on factors and practices relating to occupational injuries and illnesses among artisans.

The positivist approach

The positivist approach was employed because the study sought objectivity, and emphasis was placed on explanation as well as understanding of

factors and practices leading to OHS among auto-artisans. Positivism lends itself to associations in the study of any phenomenon or event and as a social occurrence (Scotland, 2012), OHS is subject to causes and effects which can be measured objectively using appropriate tools. The concept of positivism emerged because of the scientific revolution in the 19th century which lent much credence and support to quantitative methodology in social science research (Sarantakos, 2005). As a result, positivist scholars advocate the possibility of acquiring knowledge unmediated therefore making room for objectivity in research (Poetschke, 2003).

The ontological standpoint of positivism is "realism" (Neuman, 2006; Rorty, 2007) while its epistemology is dualist or objectivist and attempting to finding the truth (Popper, 2008). Its axiology is based on the proposition that the world is an end and is inherently valuable while methodologically, it adopts the experimental or manipulative techniques, the authentication of hypotheses as well as the application of quantitative methods (Aliyu, Bello, Kasim & Martin, 2014). The testing of hypotheses implies that positivism does not intend to generate hypotheses from research findings but rather establishes the hypotheses before the research starts so as to explore and prove the theory through tests and experiments (Cupchik, 2001). In the view of Mafuwane (2011) the positivist paradigm is concerned with hypotheses testing, this current study therefore established and tested four hypotheses.

Over the years however, the positivist approach to social science research and its theoretical basis such as its methodology and belief of social reality have

been questioned by emerging schools of thought such as the social interactionism, realism and phenomenology (Sekaran and Bougie, 2010). One of the major criticisms of the positivist approach is that the mathematical and statistical methods employed by positivist scientists hold true only in the pure sciences and not in social science research (Kasi, 2009). Even though Frank Fischer in his critique of positivism has stated that "what is identified as objective truth by rational techniques is often not the product of deeper, less visible, political presuppositions" (Fischer, 2003:14), it is still of relevance in arriving at the truth or reality which needs to be discovered.

This current study agrees with Aliyu et al. (2014) who argue that positivism could be regarded as a research approach rooted in the ontological principle and belief that truth and reality are free and independent of the viewer and observer. Similarly, Alderson (1998) is of the view that positivist theories place emphasis on context and also tend to consider the social in physical terms, such as seeing how people's estimations and expressions about a phenomenon differ. Therefore, the objectives of the current study are based on quantitative methodology to arrive at answers to questions asked and that findings will be independent of the researcher.

The current study is guided by the positivist philosophy because as social phenomena, OHS issues such as use of PPEs and safety practices involve both causes and effects which can be measured quantitatively. For instance, data on the socio-economic characteristics of auto-artisans, their awareness of workplace

hazards, perception of risk and their safety practices was obtained by employing survey questionnaire.

Study design

Research design is considered by Burns and Grove (2009) as a blueprint for conducting research with extreme control over elements which have the potential of interfering with the validity of the research findings. The study is descriptive in nature and therefore employed the cross-sectional design. Several researchers have employed cross sectional design in studying OHS. For example, Nordlöf, Wiitavaara, Högberg and Westerling (2017) used a cross-sectional design to examine factors influencing OHS practices by companies in Sweden, while Amponsah-Tawiah and Mensah (2016) also studied OHS in Ghanaian mining industry using the cross sectional design.

The study adopted the cross-sectional design because it is suitable for assessing the prevalence of OHS among auto-artisans at Suame Magazine (Setia, 2016). Again, the descriptive cross-sectional study design was considered appropriate because the study examined orientation on workplace safety respondents had received (exposure) and perception of risky job as well as awareness of OHS hazards (outcome) at the same time. Furthermore, this design was employed because much has not been studied about OHS among auto-artisans in Ghana especially, in the Suame Magazine enclave. This study design aided to considerably explain the types of injury and illnesses associated with the

various trades at the Suame Magazine enclave, their causes and practices which lead to the injuries and illnesses.

Since in cross-sectional studies, both the outcome and exposures in the study participants are measured at the same time (Setia, 2016; Levin, 2006), the study collected data on respondents' socio-demographic characteristics, their awareness of workplace hazards, their risk perception and their WTP for OHS services simultaneously. Unlike cohort studies, cross sectional studies commence by selecting a sample population and then move ahead to obtain data to categorise all individuals in the sample as either having the attributes of interest or not (Alexander, Lopes, Ricchetti-Masterson & Yeatts, 2015; Silva, 1999). A major limitation of cross-sectional design is the level of non-response (Levin, 2006). To address this challenge, the questionnaire was researcher administered, a method which increased the response rate because field workers met respondents face to face and administered the questionnaires and took the them back.

Profile of the study area

The research setting is the Suame Magazine enclave, located in Kumasi, the capital of the Ashanti Region. Kumasi is in the transitional forest zone of Ghana. It lies between latitude 6.35°N to 6.40°N and longitude 1.30°W to 1.35°W, an elevation which ranges between 250–300 metres above sea level with an area of about 254 square kilometres (Owusu-Sekyere, Harris & Bonyah, 2013). With a population of 2,035,064 people made up of 47.8 percent males and 52.2 percent females, Kumasi is ranked as the most populated city in Ghana with vast

land area, social life and economic activity (Ghana Statistical Service, 2012). The high population growth has serious consequences on employment.

Kumasi was chosen for the study due to several reasons. First, Kumasi, located in the central part of Ghana is noted for its booming commercial activities many of which are informal economic activities; and has one of the biggest and busiest markets in Ghana, and has thus been described as the commercial capital of Ghana (Devas & Korboe, 2000). It also has several transport terminals with routes linking different parts of the country which attracts people from all over the country city. The centrality of its location and the number of transport routes have made it possible for many people to travel to the city (Owusu-Sekyere, at al., 2013) to seek the services of artisans especially those in the transport industry. Kumasi was selected for the study also because it is home to many informal economy workers in many places such as the Suame Magazine, the popular Anloga wood village, the Sokoban wood village, Asafo auto mechanic centre and Kajetia market. Suame Magazine

The study was conducted in auto-artisanal workshops in the Suame Magazine enclave because according to Kumah et al. (2011), Suame Magazine houses most of the auto-garages in Kumasi and it is also considered the biggest artisanal enclave in Ghana and Africa (Gheorghe, 2009). Various researchers have concluded that there are about 200,000 artisans working in mainly auto repair services at the enclave (Azongo 2007; Gheorghe 2009; Jaarsma et al., 2011). The Suame Magazine enclave forms an important learning environment where apprenticeship leads to the mastering of specific trade (Jaarsma et al., 2011).

Again, the Suame Magazine enclave draws customers and investors from Ghana and across West Africa, as it is situated along major transport corridors from Cote d'Ivoire to Nigeria, and from northern Africa through Burkina Faso to the Atlantic Ocean (Gheorghe, 2009). The enclave also provides job opportunities for newcomers in Kumasi (Jaarsma et al., 2011). The Suame Magazine enclave was therefore selected for the study because according to Amedorme and Agbezudor (2013:49) the enclave "stands out in Ghana as the site where all vehicle and mechanical problems are solved".

The major occupation of the inhabitants in Kumasi is trading in the informal economy. There are also several medium and small-scale industries in the city. Kumasi is renowned for its indigenous innovativeness and artisan skills, particularly in the areas of furniture-making and vehicle engineering. Woodwork, leather work and textile production, including the popular traditional 'kente' cloth, are established skills amongst the residents, although manufacturing techniques are usually based on simple technology (KPMG, 2008).

The socio-cultural background of a research subject is important because it has the potential to influence the way people behave toward a phenomenon and how they respond to questions. As a result, this study placed prominence on the socio-cultural characteristics of the respondents. Traditionally, the people of Kumasi are Asantes, belonging to the Akan lineage who speak Twi as their mother language. However, due to migration, Kumasi has now become a cosmopolitan area with people from almost every part of Ghana and other West African countries residing there. One of their greatest assets is social network

since they practise the matrilineal extended family system which has kept Suame Magazine moving. This is because many of the artisans were brought in by their extended family members.

Suame Magazine has two health care facility, a number of educational facilities including the National Vocational and Technical Institute, basic and secondary schools. There are also a number of financial institutions such as banks and micro-finance institutions which serve the financial needs of both workers and clients.

In the context of OHS, the topography of the area, nature of the rods, the physical characteristics of vehicles, tools and methods employed affect the health and safety of auto-artisans in Suame Magazine (Jaarsma, 2011).

Brief history of Suame Magazine

The light industrial complex, Suame Magazine in Kumasi-Ghana, with a population of about 200,000 (Azongo, 2007; Gheorghe, 2009; Jaarsma et al., 2011), emerged in the 1920s when craftsmen in the traditional trades (gold, copper and blacksmiths) discovered an opportunity in the repair and formation of vehicle parts such as, shattered springs, bolts and nuts. This caused traditional artisans to move away from the traditional home based blacksmithing to cluster together. The mechanics were in the 1920s resettled around the ‘magazine of the colonial government’ and they referred to themselves as the “mechanics of the magazine” hence the name “magazine” (Obeng, 2001). The mechanics were later resettled in their current location in the north of Kumasi around Suame. During

the 1970's there was rapid increase in the population of Suame Magazine when auto-mobility reached Africa which propelled the economic activity in the city (Arthur, 2001).

The Magazine Mechanical Association was formed in 1957 as an umbrella organisation for all the mechanics in Suame Magazine at the time. The main goal of the formation of association was to forge together as a strong union to enable them to properly negotiate with government over relocation and other matters affecting members such as bereavement and medical aid (Powell, 1995; Adeya, 2006). The formation of the MMA was a turning point in the history of the enclave as it helped the mechanics to resist a planned relocation outside the city. It also brought unity among them. The GNAG was also formed in 1983 to represent all the artisans at Suame Magazine (McCormick, 1998; Azongo, 2007).

According to Arthur (2001), the artisans at Suame Magazine became popular when in the early 1970s the government introduced an indigenisation policy which led to a reduction in the number of vehicles and spare parts the big and formal automotive companies could import into Ghana. The artisans at Suame Magazine took advantage of the ban and began to manufacture the spare parts in larger quantities (Powell, 1995). Clients who hitherto would procure spare parts from the formal business enterprises turned to Suame Magazine for their needs. This led to a rapid increase in the production, sale and repair work at the Suame Magazine, increasing the population of the artisans. The increase in population was propelled by growth in the influx of artisans from the formal economy to establish businesses in the enclave due to job and wage loss (Powell).

A further boost to the expansion of Suame Magazine was the opening of Ghanaian borders to enable trade between Ghana and fellow West-African countries in 1981 and the implementation of trade liberalisation under the Structural Adjustment Programme (Powell, 1995; Arthur, 2001). Traders from neighbouring countries including Mali, Nigeria, Togo, Burkina Faso, Niger and Cote d 'Ivoire who traded in Ghana serviced their vehicles and also bought spare parts manufactured at the Suame Magazine enclave.

The Suame Intermediate Technology Transfer Unit (ITTU) was also established in 1980 to help the artisans to acquire modern technological skills (Powell, 1995). The idea was to bridge the gap between academic and the country's largest informal industrial zone to provide technical information and advice to the artisans (Powell, 1995).

An important aspect in the operation of Suame Magazine is the employment and training of apprentices. Apprentices form the backbone of most of the activities in most workshops. They perform most of the artisanal activities with supervision of the master craftsmen or the work-and-pay artisans. An individual becomes an apprentice at Suame Magazine when the parents or relatives of a young boy or girl is sent to a master craftsman for training. The two parties enter into agreement and money is paid to the master craftsman for the training and transfer of knowledge to the apprentice. On other situation, a master artisan may initiate his or her own child or other relatives into apprenticeship in his or her workshop (Jaarsma, 2011).

Study population

The target population for the study was auto-artisans working in the Suame Magazine enclave of Kumasi who service vehicles or fabricate auto parts. They included mechanics (fitters), auto body straighteners, auto body sprayers, welders, vulcanisers, auto electricians, radiator repairers, bumper and headlight repairers, door and key fixers, blacksmiths and engine borers/re-borers. Target respondents included both males and females aged 15 years or more working as master craftsmen or apprentices with a minimum of one-year experience. The study targeted people 15 years and above because in Ghana people often venture into apprenticeship training mostly upon the completion of basic education (Republic of Ghana, 2002) usually at age fifteen years. Secondly, Part V of the Children's Act 1998 (Act 560: Section 87) states that "the minimum age for admission of a child to employment shall be fifteen years". Section 94 of the Children's Act (Act 560) further stipulates that 'the minimum age at which a child may commence an apprenticeship training with a craftsman is fifteen years or after completion of basic education'. Using age 15 years as the minimum age of inclusion in the study, is also supported by the Minimum Age Convention, 1973 (ILO Convention 138) which stipulates that the minimum age of work should not be less than 15 years.

Targeting artisans who deal directly with vehicles is relevant because according to Shannon, Robson and Guastello (1999), researchers must be interested in the opinions and reactions of people directly involved with the on-

site activities of a workplace since their attitudes or actions could affect interventions and safety programmes.

Sample size

The last two Population and Housing Census report in Ghana (2000 and 2010 Population censuses) did not provide the population of auto-artisans at Suame Magazine. Again, the enumeration area report of the 2000 and 2010 population censuses could not be used to determine the population of auto-artisans because most of the auto-artisans do not reside at the Suame Magazine enclave and as a result they are not covered in the enumeration area report for the area. However, various researchers who have carried out studies at the Suame Magazine enclave estimate the population of artisans as 200,000 (Jaarsma et al. 2011; Adu-Gyamfi & Adjei, 2018). Out of this number, it is estimated that between 80,000 and 100,000 are auto-artisans working in 10,000 artisanal workshops (Waldman-Brown, Obeng, Adu-Gyamfi, Langevin & Adam, 2014; Gatune, 2016). The study therefore adopted 100,000 as the population of auto-artisans at Suame Magazine and a sample drawn from it.

Based on the population of 100,000, the Rose, Spinks and Canhoto (2015) sample size formula was used to determine the sample size for this study. This is expressed as:

$$n = \frac{Z^2 \times P(1-P)}{C^2}$$

Where:

- Z = Z-value (e.g., 1.96 for a 95 percent confidence level)

- P = Proportion of population having the characteristics of interest (safety practices), expressed as decimal (determined from existing studies), where 27% was chosen because according to Money, Dwumfour-Asare, Owusu-Mensah and Amankwah-Kuffour (2014) safety practices (e.g. PPE use) among auto-artisans in Ghana stands at 27%.
- C = Confidence interval, expressed as decimal (e.g., .04 = +/- 4 percentage points).

Using the above formula, the sample size was determined as follows:

$$n = \frac{1.96^2 \times 0.27(1 - 0.27)}{(0.028)^2} = \frac{0.75717936}{0.000784} = 965.79 \approx 966$$

The sample size derived from this formula was 966. However, to take care of non-response and related issues, an additional 34 respondents (representing 3.4%) were added to arrive at 1000 respondents for the survey. Based on available funds, the estimated population of auto-artisans in the study area, the nature of the population (informal economy workers with low level of formal education), the sample size of 1000 was considered adequate for the study (Burns, 2000).

Sampling procedure

A multi-stage sampling technique was employed to select the respondents for the study. The multi-stage sampling technique improved the efficiency and effectiveness of field work. Also, this sampling technique was used because there was no existing sampling frame for the study area at the time of the study, and

secondly, the actual number of auto-artisans working in the enclave or within each zone was not known. Neither the GNAG nor the SMIDO could provide the numerical strength of their membership. A number of studies have employed this technique in OHS studies. For example, Lette, Ambelu, Getahun and Mekonen (2018) used this technique to study work-related injuries among building construction workers while Agbana, Joshua, Daikwo and Metiboba (2016) and Okafoagu et al. (2017) employed the technique to examine knowledge of occupational hazards among sawmill workers in Nigeria and determinants of knowledge and safety practices of occupational hazards respectively.

Through the stratified sampling technique, the study area was first divided into four strata. This division was done to ensure easy questionnaire administration and also to avoid double counting. Suame Magazine had already been divided into 16 zones by the Ghana National Association of Garages. The zones at the enclave were grouped to form strata A, B, C and D (see Figure 3). The strata were formed based on the geographical location and proximity of the zones to each other. Zones 1, 20, 21 and 23 were placed under stratum A; zones 2, 3, 4 and 5 were labelled as stratum B; zones 8, 9, 13 and 18 were placed under stratum C; while zones 6, 7, 11 and 12 formed stratum D. The strata had clear boundaries (based on the road network) which facilitated identification, and eliminated double counting.

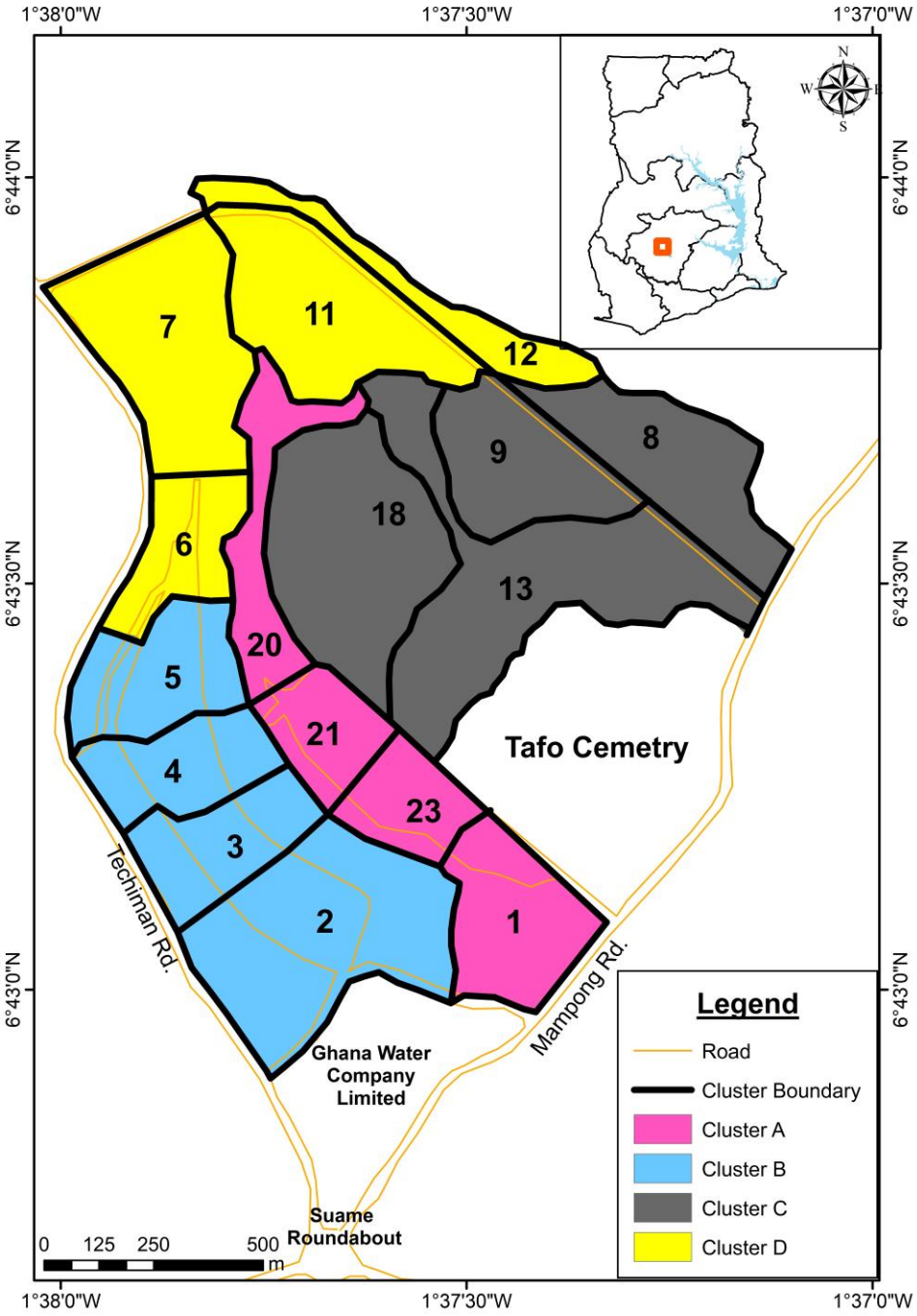

Figure 3: Map of Suame Magazine showing the zones and clusters

Source: GIS and Cartography Unit, Department of Geography and Regional Planning, UCC (2016).

The zones within each stratum were also located close to one another (Jawale, 2012) to ensure easy administration of questionnaires. Due to the large size of the enclave, the nature and arrangement of physical structures, such as artisanal workshops, stores and ware-houses, stratified sampling technique became the preferred sampling technique to make the sampling procedure comparatively easier. The technique also reduced the likelihood for contamination bias between the respondents (Friese et al., 2015) and also eliminated double counting since the strata were clearly delineated with clear boundaries.

The next stage of the sampling procedure was to assign the number of respondents to each stratum. For representativeness, the strata were given equal proportion of 25 percent of the total sample size which translated into 250 respondents. Equal proportions were assigned to the strata because each stratum was made up of four zones and there was no data to determine the number of auto-artisans in each zone. Each zone in a stratum was divided into four; north, south, east and west for easy administration of questionnaires. Systematic sampling method was then employed to select workshops from the north, south, east and west divisions.

The first workshop in the north, south, east and west divisions was conveniently picked after which each fifth workshop was selected. This was done because according to estimates, there are 10,000 auto-artisanal workshops at the enclave and based on the sample size of 1,000, and the fact that at each selected workshop, a master artisan and an apprentice were to be included in the study, 500 workshops were needed and therefore selected from the estimated 10,000

workshops. The 500 workshops were divided by four (being the four strata) and each stratum was therefore assigned 125 workshops as stated earlier, which translated into 31 workshops for each of the four zones within a stratum. As a result, in each zone the 20th workshop was to be selected; however, since the zones had already been divided into north, south, east and west sections to ensure wider coverage, the fifth workshop was selected. Field assistants then moved from one selected workshop to another and administered questionnaire till all the selected workshops were reached.

At each workshop, a master craftsman and an apprentice were sampled through simple random sampling technique and questionnaires administered to them. Some of the workshops had two or three master artisans, and as many as 15 apprentices. As a result, in a workshop where there was only one master artisan, he or she was automatically selected but where there were more than one master artisan or work-and-pay artisan, one of them was selected randomly. The same procedure was used in the selection of the apprentices. This was done throughout the four strata till the required total sample size was attained. To sample equal number of respondents with reference to master artisans and apprentices, work-and-pay artisans were considered as master artisans. This is because work-and-pay artisans most often serve as master artisans who train apprentices.

Twenty-nine workshops were conveniently selected for a non-participant observation. One workshop was conveniently selected from each of the 29 artisanal trades identified at the Suame Magazine enclave. The convenient

sampling was based on the willingness of a master artisan to allow his workshop to be observed.

Data sources

The study employed primary data as the source of data. Primary data was collected from auto-artisans working in the Suame Magazine enclave. Respondents comprised both master craftsmen and apprentices who have at least one year working experience. The respondents were selected across all the auto artisanal trades identified at the enclave.

Instruments for data collection

Upon a careful study based on the objectives, the philosophy and the conceptual framework of the research, the study employed both a structured questionnaire and an observational checklist as the instruments for data collection. The questionnaire was researcher administered due to the low levels of literacy among workers of the informal economy especially artisans as indicated by Dhingra, Mudgal and Dhingra (2017). The questionnaire was administered in the local language Twi, which is the language best understood and used by artisans at the enclave. The questionnaire also included open-ended questions developed based on literature, conceptual models and preliminary contacts made. Previously developed and tested questionnaires were also reviewed and those found relevant to the study were incorporated into the design of the questionnaire. Questionnaires were used as instrument for data collection because; “the questionnaire survey is

an indispensable tool when primary data are required about people, their behaviour, attitudes and opinions and their awareness of specific issues" (Parfitt, 2005:78).

Again, questionnaires were used because according to Sansoni (2011), questionnaires can reach large number of respondents in limited time and at the same time produce data which cannot be obtained when using other means. The items on the questionnaire were grouped into four main parts. The first section comprised the socio-demographic characteristics of respondents such as age, sex, marital status, level of education, religious affiliation, and the number of years of working experience. The other sections consisted of the level of awareness of OHS hazards among respondents; their views on the cost of occupational injuries and diseases; OHS practices; and the willingness to pay for OHS services. Even though the use of questionnaire for data generation has been criticised for the fact that responses obtained lack depth, it was considered as the most appropriate instrument because using questionnaire to generate data guarantees a high response rate. It limited possible bias and provided necessary explanations given the benefit of personal contact (Akbayrak, 2000). The questionnaire was supported by an observational checklist, in order to obtain a first-hand information about the safety practices of the artisans as well as to validate the responses from the survey, the study employed a mixed method approach to generate and analyse data.

Selection and training of research assistants

After carefully considering the enormity of this study with reference to the volume of data to be collected, time and cost revealed the need to recruitment research assistants. It was also established that using research assistants to collect data does not affect the study in any negative way and does not cause harm to research subjects and respondents when the assistants are properly trained. Prominence was placed on the selection and training of research assistants to ensure the generation of quality data.

Eight research assistants were selected based on their level of education, experience in data collection process and techniques, knowledge in the field of health and safety issues. The selection of research assistants was also based on their knowledge of the study area and their ability to speak Twi (the language commonly used at Suame Magazine for daily business and other activities) and Hausa. Field assistants used for data collection were made up of senior research assistants and graduate students from the University of Cape Coast who had been involved in previous data collection for the Faculty of Social Sciences and other researchers. One student from the Cape Coast Technical University was selected to be part of the field assistants because of her knowledge of the study area, her ability to speak Twi, Huasa, Ga and Ewe as well as her previous experiences in data collection at the Suame Magazine enclave.

The selected research assistants were given adequate training at the University of Cape Coast. The training exercise was in two main phases. The first phase involved the translation of each question or item on the data collection

instruments into Twi. Phase 2 involved training research assistants in data collection techniques, on how to ask questions in a neutral manner. They were also trained on how to avoid giving leads to expected answers by verbal or non-verbal expressions. The research assistants were also trained not to show agreement, disagreement or surprise to answers provided by respondents and to record answers precisely as they are provided, without sifting or interpreting them further to give a different meaning (Varkevisser, Pathmanathan & Brownlee, 2003). The third phase of the training was devoted to role-plays and positionality, pre-testing of the research instruments and discussion of issues which emerged from the pre-testing of the instruments. Eight people were trained to assist in the field work as field assistants, however, one of them was not included because of ill health immediately before the data collection began. As a result, seven of the trained research assistants were retained and participated in the data collection exercise.

Pre-testing of data collection instrument

When the research topic, objectives of the study, techniques and instruments for data collection had been concluded and approved, the pre-testing of the data collection instruments were initiated. The instrument for data collection was pre-tested at the Siwdo fitting cluster in Cape Coast-Central Region. Siwdo fitting cluster was chosen for the pre-test because it has similar characteristics as Suame Magazine in terms of auto-artisanal and other related activities. Both enclaves are dominated by vehicle repair workshops operated by

artisans in the informal economy using similar techniques and tools for their daily activities. Secondly, auto-artisans in both Suame Magazine and Siwdo fitting cluster have common variety of artisanal trades.

The pre-test of the instruments allowed for the identification of ambiguity in the questions and items on the data collection. The pre-test was also used to test how respondents understood the questions and items on the instruments. Pretesting the data collection instrument helped to identify challenges associated with the instruments and also increased the reliability of the instruments. It also ensured personal and professional fulfilment of the research assistants (Hurst et al., 2015). The pre-test of the instruments was used to test the ability of the instruments to capture the necessary data which correspond to the objectives of the study. Secondly, the pre-test was used to assess whether the instruments met the desired criteria of being understood in the same way by all respondents and the ability of the survey items to measure what it is intended to measure.

A major motivation for the pre-tests of the instrument was to determine whether or not respondents would be able to remember (Ruel, Wagner & Gillespie, 2016) the orientation they received on OHS when they were first admitted into artisanship as apprentices or to the various workplaces. This is because the main educational intervention of the study was orientation on workplace safety respondents received when they were first admitted into artisanship. The pre-test at the Siwdo fitting enclave in Cape Coast established a high level of recall among auto-artisans who took part in the pre-test. The pre-test brought to light the length of time it took respondents to complete answering the

instrument, clarity and ambiguity of the instrument, the reasonable flow of different sections from one to the next, the orderly presentation within sections of the instrument and whether the questions measured what they were intended to measure.

The pre-test of the questionnaire made it possible for errors and challenges identified to be corrected before the actual administration. It also helped to reduce most of the limitations the data would have faced in areas such as content, interpretation and validity. After the pre-test the instrument was revised.

Reconnaissance survey

Contacts were made to major stakeholders at the Suame Magazine enclave. Three visits were made to the enclave; the first was to request permission from the leadership of the three main artisanal associations at the magazine enclave; namely the Ghana National Association of Garages, Magazine Mechanics Association and the SMIDO. The second visit was to introduce myself to the leadership of the various zones at the enclave and to inform them of the study. The third visit was to establish rapport with the leaders of the various associations at the enclave, respondents and other stakeholders. Similarly, a visit was made to the Kumasi Metropolitan Assembly to seek permission to conduct the research in the city.

Variables and measurements

The independent variables were orientation on OHS training received by respondents, awareness of occupational hazards, perception of risky jobs, organisational factors and socio-demographic characteristics. The outcome variables in this study were OHS practices and WTP for OHS services. All the variables were selected based on the PMT (Rogers, 1975), the conceptual framework adapted for the study (Friese et al., 2015) and the literature (Budhathoki et al., 2014; Tadesse, Bezabih, Destaw & Assefa, 2016).

To measure awareness of occupational hazards, a number of options were considered. For example, Tadesse, Bezabih, Destaw and Assefa (2016) used summary score of participants responses to a set of questions to determine their awareness of workplace hazards. The mean score was taken as a cut-off point and those who scored above the mean were considered as having awareness while those who scored below the mean were considered as not having awareness of workplace hazard. This approach was not considered appropriate for the study because responses could not be calculated based on mean scores.

The study therefore adopted another technique where respondents, were required to provide "Yes" or "No" response. The questions asked were: 1) Are you aware of hazards associated with your work? 2) Are you aware that you can suffer workplace injuries and illnesses? 3) Are you aware of any circumstance(s) which can lead to workplace injuries or illnesses at your workshop? Respondents who answered "Yes" were further asked to elaborate by stating workplace hazards they face. Respondents who were able to mention three or more workplace

hazards were considered as being well aware, those who mentioned two were considered as being fairly aware and less than two as being poorly aware. Respondents who were able to mention two or more had their answers recoded as "Yes" indicating awareness while those who mentioned one or none had theirs recoded as "No" indicating no awareness. This method is in line with the accepted definition and measurement of awareness (Gafoor, 2012), workplace hazard awareness (Lay et al., 2015; Tagurum et al., 2018) as used widely and also adopted by this study.

Response rate

Out of the 1000 questionnaires administered and returned from the field, 43 had incomplete portions which rendered them not usable and appropriate for analysis, leaving 957 (95.7%) which were considered useful for the analysis.

Ethical issues

Ethics is considered a major part of every social science research in recent times. As a result, issues concerning ethics were highly valued and upheld by this study. The study protocol was approved by the Department of Population and Health, and the School of Graduate Studies of the University of Cape Coast. Verbal permission was obtained from the labour associations at the Suame Magazine enclave before the start of fieldwork.

During the administration of the research instruments (observation checklist and questionnaires), the researcher and the research assistants

established rapport and identified themselves with the respondents to avoid suspicion and mistrust. This was achieved through several visits to the study area before the start of the data collection process. In this regard, an introductory letter was obtained from the Department of Population and Health which aided proper identification of the researcher and field assistants. The purpose of the study and the nature of the research instruments were made known to respondents. Respondents as well as political and opinion leaders in the study area were made aware that the study is solely for academic purpose.

Informed consent was therefore sought from respondents orally. Only two respondents (apprentices) were less than 18 years, and there was the need for parental consent. This was not possible because tracing their parents proved difficult. As a result, their masters stood in and gave the consent since they (the master craftsmen) were responsible for the welfare of their apprentices. Participation in the study was purely voluntary. This was well explained to all participants well before the questionnaire was administered to them. Anonymity of respondents was also respected. During the field work, all forms of identification including names, addresses and telephone numbers of respondents were avoided. This motivated the respondents to freely open-up and share their views and opinions.

Validity and reliability

Appropriate measures were taken to ensure validity of data collected which include pre-testing the research instruments before the actual data

collection. Furthermore, standardised questionnaires which had previously been used in studies on OHS (Weel & Fortuin, 1998) were adopted. Additional appropriate and relevant questions were sought and used during the designing stage of the questionnaire and observation checklist. In the field, research assistants explained to all respondents the purpose of the research before the administration of research instruments began; this was aimed to alley and remove all suspicions and fear the respondents might be harbouring with the aim of obtaining reliable information from them.

Quality control/data quality

The quality of the data gathered was ensured in several ways; the first was the designing of the data collection instruments (questionnaire, observation check list). Efforts were made to avoid ambiguous and double-barrelled questions on the data collection instruments-the questionnaire. The wording and content of the questions on the instruments used were also taken into consideration by making sure that the subjects of the research understand them. The amount of time used in answering the questionnaire was also controlled by the number of items/questions on a data instrument in order not to make respondents feel bored and tired during questionnaire administration which could lead to the provision of wrong information by respondents or respondents abandoning the process mid-way.

Another quality control measure which was considered is the training of research assistants; this action was very useful since the research assistants were engaged mostly in the questionnaire administration for the respondents, and their

training on the aim, purpose of the research, as well as their education on common interpretation of the questionnaire became necessary. Another strategy to ensure data quality was that after each day's work a meeting was held between the researcher and the research assistants to discuss events of the day. Experiences were shared among us on what went right and what went wrong and how to improve the process. At these meetings, filled questionnaires were scrutinised to identify errors for necessary attention; and data were adequately scrutinised (Banda, 2003). Effective communication between the researcher and field assistants was also ensured throughout the field work.

Data collection/fieldwork

The fieldwork or data collection was in two sections. The questionnaire administration commenced on 11th o January, 2016 and ended on 30th January, 2016 at Suame Magazine-Kumasi in the Ashanti region of Ghana. On the first day of the field work, the data collection team had a meeting with the executives of the Ghana National Association of Garages. This was meant to introduce the research assistants to the executives and to inform them of our presence. The various zonal chairmen sent information to their executives and members about the data collection. Seven field assistants were engaged to assist in the fieldwork to administer questionnaires to auto-artisans of different specialities such as auto mechanics, auto electricians, key cutters, radiator and bump repairers. Data collection started at 8:30am on each day and closed at 5:00pm. After each day's work, a mini-meeting was held between the researcher and the research assistants

to discuss issues which arose out of the fieldwork. We shared experiences and identified errors committed. At these meetings, administered questionnaires were scrutinised to identify possible errors.

A non-participant observation was conducted between 18th April, 2016 and 6th May, 2016. The observation aimed at collecting data on the safety practices of auto-artisans at the enclave. One workshop was selected from each of the 29 identified auto-artisanal trades and observed twice in a day. Each of the selected workshops was observed twice in a day; one in the morning and one in the afternoon of the same day. Each observation lasted for at least one and a half hours. On average, two workshops were observed in a day. In all, 58 observations were made. Through the observation data on the actual use of PPE, house-keeping, inspection of vehicles and vehicle parts to assess hazards were generated. Similarly, the observation was used to collect data on action taken by respondents to ensure safety at the workplace and the availability of fire extinguishers and smoke detectors at the workplaces.

The fieldwork was generally successful due to the number of preliminary contacts made before the actual data collection process. Most of the respondents were very receptive and even offered snacks to field assistants after the interview. This warm reception might be as a result of the importance of the study to the respondents. Most of them were already aware of the study and as a result introduction of the research team was not difficult. Secondly, the success of the data collection process was because the GNAG assigned their guards to

accompany the research team to the various workshops from the beginning of the process to the end.

Notwithstanding the general success, the whole data collection process was not without challenges. Some of the challenges faced were the busy nature of the work of the respondents which made it difficult to get some of the respondents at the right time. Other challenges were noise produced by the machines, dust and exposure to chemicals. These made it uncomfortable for the data collection team to administer questionnaires and caused us suffer headaches, problems with the ears and eyes since we had to inhale some particles while these artisans engage in their daily activities of hammering, noise making, spraying, and welding among others. These challenges were overcome by pleading with the respondents to move further away from their shops (to reduce the effect of the noise) or to halt their work for the questionnaire to be administered.

Data processing and analysis

The completed questionnaires were arranged and cross-checked to ensure completeness. The questionnaires were numbered serially to keep track of each questionnaire and later entered into Statistical Product for Service Solution (SPSS version 23.0) template which was developed based on the questionnaire. Cleaning of the data was done by cross-checking the data with the questionnaires to ensure that responses from each questionnaire has been entered correctly and the few inconsistencies that were noted were resolved appropriately.

The study employed descriptive and inferential statistics to analyse the data gathered from the field using Statistical Product for Service Solution (SPSS version 23.0). The study used frequencies, percentages and cross tabulations to profile the various artisanal trade at Suame Magazine and to determine the level of awareness of OHS risks among artisans. Results were presented in tables and figures. The Pearson's chi-square test of independence was used to address the objectives relating to awareness of workplace hazards; OHS practices among auto-artisans; and WTP for OHS services. However, in situation where a table does not have adequate expected cell count; that is, where more than 20% of cells in a table had expected frequency count less than 5 cases, the Fisher's Exact test was used to determine the associations. This is because the Fisher's Test is an exact test while the Pearson's chi-square is an approximation test.

The chi-square test of association was also used to test the hypotheses stated in the study. All the hypotheses were tested at a significant level of 0.05 (5%). Chi square test of independence was used to analyse the data because the data generated were categorical data obtained from the same population, and the respondents were randomly selected.

Again, logistic regression was used to study the association of socio-demographic characteristics with use of PPE, and WTP for OHS services by respondents. Binary logistic regression model was performed to examine the predictive relationship between the dependent variables (use of PPE, and WTP for OHS services) and independent variables (socio-age, marital status, level of education, occupation, educational status, work experience, type of trade and

income). The model was done sequentially in order to evaluate the predictive effects of each of the socio-demographic characteristics on the use of PPE by respondents and the WTP for OHS services.

In order to test the association between orientation on OHS and WTP for OHS services, two sequential models were done. In Model 1, orientation on OHS was regressed against WTP for OHS services, while socio-demographic characteristics were controlled for in Model 2. Similarly, a model was constructed to examine how orientation on OHS would predict the likelihood of the auto-artisan using PPE. In this regard, two sequential models were done. In Model 1, orientation on OHS was modelled against use of PPE. In the second model, witnessing an accident or near miss was controlled for in the model. In the final model (Model 3), socio-demographic characteristics were added to examine their predictive association with the use of PPE.

With regard to the qualitative data, the data from the observation were manually coded and variables of interest clustered and selected into common themes such as use of PPE, inspection of vehicles, housekeeping and arrangement of working tools and vehicle parts for presentation. The data were clustered based on themes because according to Ferreira (2015), clustering data into themes ensures easy and effective analysis. This allowed the performance of thematic analysis on coded segments to select themes for presentation to complement the quantitative data. The analysis was descriptively done using the themes based on the third objective of the study. Data from the observations were analysed to

examine the use of PPE among auto-artisans, respondents' housekeeping practices and inspection of vehicles to assess hazards.

Summary

This chapter discussed the methodology employed for the study and the procedures which were followed to collect data from the field. It briefly looked at the positivism as the main philosophy behind the study. It discussed the simple random and systematic sapling techniques employed and how they were used to sample the study population as well as the sample size and ethical issues considered during the study. The chapter also considered selection and training of research assistants, methods of data processing, pre-testing of data collection instrument which led to the drafting of the final instruments used to collect data. Finally, fieldwork report enumerating challenges encountered was discussed in this chapter. The next chapter presents the results and discusses the profile of artisans at the Suame Magazine enclave.

CHAPTER FIVE

PROFILE OF AUTO-ARTISANAL TRADES AT SUAME MAGAZINE

Introduction

This chapter presents the profile of the various auto-artisanal trades existing at Suame Magazine. Identifying and profiling the various auto-artisanal trades would help in examining their OHS risks and practices. In addition, profiling the various artisanal trades within the study area has possible implications for policy and planning. In profiling the various auto-artisanal trades, the study describes the socio-demographic characteristics of the respondents–sex, age, marital status, and educational background. Again, descriptive statistics of their average income is presented and discussed.

Auto-artisanal trades

The study identified 29 artisanal trades engaged in as vocation by auto-artisans at Suame Magazine. These trades were grouped into three main categories based on the kind of services provided (Table 2). The first broad category is auto-mechanic, which consists of mechanics (fitters), pump & injection servicing, auto electrical, radiator (water tank) servicing, gear box repair, steer wheel repair, door doctors and shock absorber repairs. The second category covers auto-body works which is made up of body spraying, windscreen repairs, welding and body straightening while the third broad category includes those into

ancillary services. Ancillary services include engine re-boring rubber bushing fabrication, vulcanising, drilling, ignition key cutting, upholstery, metal component fabrication, gasket fabrication, clutch and brake pad moulding, carpentry and blacksmithing.

Table 2: Auto-artisanal trades at Suame Magazine

Type of artisanal trade		
Auto-Mechanic	**Auto-Body works**	**Ancillary works**
Auto electrical	Body straightening	Engine re-boring
Mechanic (fitters)	Welding	Vulcanising
Pump/injection servicing	Windscreen repairs	Rubber bushing fabrication
Shock absorber repairs	Body spraying	Drilling
Steer wheel repair		Ignition key cutting
Gear box repair		Upholstery
Door doctor*		
Radiator servicing		Blacksmithing
Exhaust pipe repair		Metal component fabrication
Air condition installing		Carpentry
Wheel re-alignment		Lathe turning
		Battery servicing
		Gasket fabrication,
		Clutch/brake pad moulding
		Bumper repair/tail light

Source: Field Survey (2016)
*Door doctors service door hinges and locks

In this section, the three major auto-artisanal groupings at Suame Magazine identified by the study are described in detail. These are auto-mechanics; auto-body works and ancillary works. Auto-mechanics are artisans who work directly on a vehicle by removing and replacing used-up parts, (this activity has earned them the term *fitters*). Auto-mechanics at Suame Magazine

comprise gearbox repairers, steering wheel repairers, radiator repairers, shock absorber repairers, auto electricians and those who engage in the repair of the engine and associated parts usually referred to as fitters. Though gearbox repairers are fitters, they have specialised in the servicing of only gearbox or transmission system (both automatic and manual). On the other hand, artisans engaged in steering wheel repairs have also specialised in the repair of only the steering wheel of vehicles and its accessories such as horns, knobs, centre caps and pullers. Pump and injection servicing operators are also engaged in servicing fuel pumps, injectors, injector plugs, and carburettors. Auto electricians deal in servicing anything relating to the electrical system of a vehicle, including re-laying of wires, fixing and replacing dead bulbs, fuse and also repair of control boards. Radiator (locally called water tank) repairers are mechanics who have specialised in the servicing of radiators.

The second category is auto-body works, which involves working on the structural or skeleton of the auto mobile. The study found that auto body works at Suame Magazine is made up of body spraying, windscreen repairs, welding, and body straightening. Artisans in this area prepare the body of the vehicle after an accident, rusting, minor panel dent or general body defects. Auto body straighteners prepare the body to make it ready for spraying. Welders on the other hand, do general welding of any metal components of a vehicle, which needs to be welded. In addition, welders also engage in the extension of body frames but they do not straighten the external body of vehicles. Windscreen repairers fix or replace windscreens, side glasses, door and back glasses, as well as repairing

chipped or cracked windscreen. Finally, auto body sprayers do the final preparation of the body of vehicles and then spray the vehicle.

The third category of artisanal trades identified is the provision of ancillary services. Ancillary services are those performed by artisans who do not work directly on the vehicles but produce parts, which are used by fitters and the auto-bodywork artisans. The first among the ancillary services (not in the order of value) is the fabrication of vehicle parts. There are three main elements of fabrication: rubber bushing fabrication, gasket fabrication and metal component fabrication. Rubber bushing fabrication involves the manufacturing of rubber bushings used to protect metal joints such as lower and upper arms, springs and shock absorbers. A typical example of a rubber bushing fabricated by artisans at Suame Magazine is the engine seat. It was evident from the observations that artisans who engaged in rubber bushing fabrication are very innovative and experts in improvising. They fabricate the bushing from used vehicle tyres, especially tyres used by heavy duty equipment such as bulldozers. The next fabrication trade is metal component fabrication which involves the production of metal components of vehicles, which are difficult to obtain or are expensive when imported. These include metal bumper, fenders, and emblems.

The last fabrication trade is gasket fabrication, which involves the manufacturing of gaskets which are used to prevent the leakage of fluids such as engine oil inside the engine. Another ancillary trade identified at Suame Magazine is drilling. Artisans engaged in this trade drill holes into vehicle parts for bolts and nuts. This service is performed when the existing holes for bolt and nuts are

damaged or when a vehicle part needs alteration. Lathe turning is another major ancillary service provided by artisans at the Suame Magazine. Lathe turners produce bolts and nuts, battery terminals, engine valves, engine linings and cramps for holding other vehicle parts together.

Blacksmithing is another auto artisanal trade engaged in by artisans at Suame Magazine. Blacksmiths manufacture vehicle parts such as springs, they also manufacture tools such as chisel, and hammer used by other artisans. Ignition key cutting was also identified as one of the trades engaged in by artisan. Artisans in this trade are engaged in manufacturing or cutting of ignition and door lock keys to replace lost keys or to serve as spare keys. They also service damaged ignition locks and door locks. Upholstery, which is known at the Suame Magazine enclave and among other auto artisans and drivers as “lining”, involves the production of vehicle seats and the sewing of car seat covers using leather or fabric materials. Clutch and brake pad production is another trade engaged in by artisans at the enclave. Artisans use asbestos to produce clutch and brake pads or linings which are fixed into vehicles by the mechanics.

The study also identified carpentry as an auto artisanal trade. Carpenters at Suame Magazine convert container trucks into cargo trucks with wooden panels. Another significant and innovative trade identified by the study is bumper and taillight repair. In this trade, artisans repair or mend broken and cracked bumpers, headlights and taillights using open fire and locally improvised tools.

Occupational status of respondents

This section presents the occupational status of the respondents and the type of trade respondents are engaged in. A descriptive analysis was performed on respondents' occupational status and results are presented in Table 3. Generally, there are three occupational classes of artisans identified at the Suame Magazine cluster, namely, master artisans, work-and-pay artisans and apprentices. Master artisans are individuals or artisans of consummate skills and directs the work of others probably, 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 organised by the worker associations and the city authorities.

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.

From Table 3, master artisans constituted 46.3 percent of the total respondents (957) for the study. Work-and-pay artisans constituted about 3 percent, whereas about half (50.7%) of the respondents were apprentices.

As shown in Table 3, 42 percent of the artisans sampled for the study are fitters while welders constituted 10 percent of the respondents, with sprayers and blacksmiths accounting for 6.8 percent, and 5.3 percent respectively. Upholstery and lathe turners comprised 3.6 percent and 2.6 percent respectively. Clutch and brake pad moulders were 20 artisans constituting 2.1 percent and vulcanisers were 20 out of the 957 auto-artisans sampled for the study representing 2.1 percent. Battery repairers (battery doctors) were 2.3 percent while radiator repairers were 1.3 percent.

Table 3 further demonstrates that mechanics (fitters) constitute a greater proportion of master artisans (37.5%). It is worth noting that all the trades represented have master artisans, however, it is not the same for both work-and-pay artisans and apprentices. Apart from shock absorber and gear box repairers who recorded only one master artisan each, the remaining trades recorded two or more master artisans. Moreover, mechanics (fitters) constitute the majority (39.3%) of all work-and-pay artisans who took part in the study. Again, mechanic apprentices accounted for 45 percent of all the apprentices. Nine out of 29 trades had work and pay artisans; these trades are, mechanic (fitting), welding, battery

repairs clutch and brake pad moulding, metal component fabrication, lathe turning, vulcanising, blacksmithing and spraying.

Table 3: Distribution of respondents by occupational status and type of trade

Type of artisanal trade	Occupational status			Total
	Master (%)	Work & pay (%)	Apprentice (%)	(%)
Mechanic (fitting)	37.5)	39.3	46.3	42.0
Welding	11.5)	7.1	8.4	9.8
Battery servicing	2.5)	7.1	1.9	2.3
Engine re-boring	0.5)	0	0.2	0.3
Clutch and brake pad moulding	1.4)	0.0	2.9	2.1
Gasket fabrication	0.5)	0	0.4	0.4
Metal component fabrication	0.5)	3.6	0.2	0.4
Steer wheel repair	0.9	0	0.6	0.7
Lathe turning	1.6	7.1	3.3	2.6
Upholstery	5.4	0	2.1	3.6
Ignition key cutting	0.7	0	0	0.3
Radiator servicing	1.6	0	1.0	1.3
Drilling	1.4	0	0.6	0.9
Windscreen servicing	0.5	0	0.2	0.3
Shock absorber repairer	0.2	0	0.2	0.2
Pump & injection repair	3.2	0	5.1	4.1
Gear box repair	0.2	0	0.2	0.2
Vulcanising	2.5	3.6	2.1	2.1
Body straightening	9.7	0	6.4	7.7
Auto electrical	3.4	0	5.1	4.2
Blacksmithing	6.1	7.1	4.5	5.7
Body spraying	5.6	21.4	7.7	6.8
Door doctor	0.2	0.0	0.0	0.1
Rubber bushing fabrication	0.5	0	0.2	0.3
Wheel realignment	0.7	0	0.6	0.6
Carpentry	0.5	0	0	0.2
Air conditioning installing	0.5	0	0.4	0.4
Bumper repair	0.5	0	0.4	0.4
Exhaust pipe repair	0.2	3.6	0.0	0.3
Total	443(46.3)	28(2.9)	486(50.8)	957(100)

Source: Field survey (2016)

Socio-demographic characteristics of respondents

This section presents the socio-demographic characteristics of respondents in relation to occupational status and the type of trade artisans are engaged in. The socio-demographic characteristics of interest were age, level of education, marital status, income, job experiences and membership of labour union or association.

It was found that most (99.7%) were males with only three (0.3%) females among the respondents (auto-artisans) studied at Suame Magazine. Two of these female auto-artisans were mechanics while the other one was engaged in auto-body spraying.

Data on the age of the respondents were collected in completed years at the time of the survey. Table 4 shows that 35.3 percent of the total number of respondents were aged 20-29 years 29.6 percent were aged between 30 and 39 years. About 2.5 percent of the respondents were aged 60 years and above. The average age of an apprentice was 25 years with the minimum age being 15 years and a maximum age of 50 years. The minimum age of work-and-pay artisan was 18 years and the maximum age 46 years, while the minimum and maximum ages of master artisans were 18 years and 73 years respectively, with the average age of the master artisans being 41 years.

Table 4 reveals that 49 percent of the respondents were never married at the time of the survey while 44.7 percent said they were married. Almost one out of four master artisans (22.1%) said they were not married as compared to about 2 out of 3 apprentices (73.9%) who said they had never married.

On weekly income, it emerged that 32. 4 percent of the respondents earned 400Ghs or more while 21.7 percent said they earned between 100 and 199Ghs per week. Similarly, 16.3 percent and 14.3 percent said they earned 200Ghs-299Ghs and 300Ghs-399Ghs respectively on weekly bases. Not much differences were found between the weekly earnings of respondents with respect to the type of auto-artisanal trade one is engaged in. For example, as 33.5 percent of the mechanics said they earned 400Ghs and above per week, 32.3 percent of those engaged in auto-body works said they also earned 400Ghs and above.

Educational level of respondents was recorded based on the level completed. More than two-thirds (69.3%) of the respondents indicated that they completed basic education (junior high school/middle school) followed by 15.3 percent who said they completed secondary school. Seven respondents, representing 0.7 percent of the sampled auto-artisans said they completed tertiary education.

As part of the profile, the respondents were asked to state the number of years they had worked as auto-artisans. It emerged that 48.9 percent of the respondents had worked as auto-artisans at the enclave between 1 and 10 years while 1.7%) said they had worked as auto-artisans for more than 40 years. Much differences were not found in the number of years respondents had worked as auto-artisans in terms of the type of auto-artisanal trade engaged in. For instance, 49.6 percent of auto-body workers, 49.3 percent of ancillary service providers and 48.4 percent of mechanics said they had worked between 1 and 10 years as compared to 16.9 percent of master artisans.

Table 4: Distribution of respondents by personal characteristics, type of trade and occupational status (Percentage)

Demographics characteristics	Type of trade				Occupational status			
	Autobody Works	Mechanics	Ancillary work	Total	Master Artisan	Work & Pay	Apprentice	Total
Age in years								
Less than 20	6.4	7.8	11.0	8.2	0.2	14.3	15.0	8.2
20-29	36.4	34.7	37.4	35.3	10.8	39.3	58.2	35.7
30-39	27.5	32.0	26.1	29.6	35.4	28.6	24.3	29.6
40-49	20.3	16.9	17.1	17.8	34.8	17.8	2.3	17.8
50-59	6.7	5.9	6.6	6.3	13.3	0.0	0.2	6.3
60 and above	2.5	2.7	1.9	2.5	5.4	0.0	0.0	2.5
Marital status								
Never married	45.3	50.7	49.8	49.2	22.1	46.4	73.9	49.1
Married	47.9	43.6	44.1	44.7	72.7	35.7	19.7	44.7
Cohabited	5.5	4.6	6.2	5.1	36.1	10.7	6.2	5.1
Separated	0.8	0.9	0	0.7	1.4	3.6	0	0.7
Divorced	0.4	0.1	0	0.2	0.2	3.6	0	0.2
Widowed	0.0	0.1	0	0.1	0	0	0.2	0.1
Average weekly income (Ghs)								
0-99	14.4	16.3	13.7	15.3	12.4	3.6	18.5	15.3
100-199	22.0	20.2	25.1	21.7	22.3	32.1	20.6	21.7
200-299	17.8	15.5	16.6	16.3	17.0	3.6	16.5	16.3
300-399	13.6	14.5	14.7	14.3	12.6	39.3	14.4	14.3
400 and above	32.2	33.5	29.9	32.4	35.7	10.7	30.0	32.4

Table 4 Continued

Level of Education completed								
No formal Edu.	3.4	7.6	8.1	6.7	7.4	10.7	5.8	6.7
Primary	9.7	11.4	12.3	11.2	9.7	10.7	12.6	11.2
JHS/Middle	73.3	67.7	59.2	66.1	69.8	57.1	63.4	69.3
Sec/Tech	12.7	14.9	19.0	15.3	12.0	21.4	17.9	15.3
Tertiary	0.8	0.3	1.4	0.7	1.1	0	0.4	0.7
Years of working experience								
1-10 years	49.6	48.4	49.3	48.9	16.9	57.1	77.6	48.9
11-20 years	27.4	30.8	29.3	29.6	42.7	28.6	17.9	27.7
21-30 years	15.2	14.3	11.8	14.0	26.1	10.7	3.1	14.0
31-40	6.8	4.3	8.5	5.9	11.3	3.6	1.0	5.9
41 and above	0.8	2.2	0.9	1.6	2.7	0.0	0.4	1.6
Membership of association								
No	58.5	52.7	53.1	54.2	46.3	60.7	61.1	54.2
Yes	41.5	47.3	46.9	45.8	53.7	39.3	40.9	45.8
Total	236	510	211	957(100)	443	28	486	957(100)

Source: Field survey (2016)

Finally, with respect to membership of labour associations at the enclave, Table 4 demonstrates that the majority (54.2%) were not members of any of the labour associations 45.8 percent said they were members of the various labour associations or unions.

Affiliated labour associations of respondents

Lastly, the study sought to identify the registered and recognised associations or organisations artisans at Suame Magazine are affiliated to. The major associations identified by the study are Ghana National Association of Garages, MMA and SMIDO.

Figure 4 presents the distribution of associations which respondents are affiliated to. More than half (53.6%) of the respondents did not belong to any of the recognised associations at the enclave. However, 43.4 percent of the total respondents said they were members of the Ghana National Associations of Garages. On the other hand, 1.9 percent said they were members of SMIDO and 0.6 percent being members of MMA.

Again, the results indicate 93.5 percent of the respondents who indicated they belong to an association at the enclave were members of the Ghana National Association of Garages. The breakdown based on the occupational status of the artisans indicates that most (54%) of the master artisans were either members of one association or another Similarly, less than half (39.3%) of the apprentices said they belong to an association at the enclave.

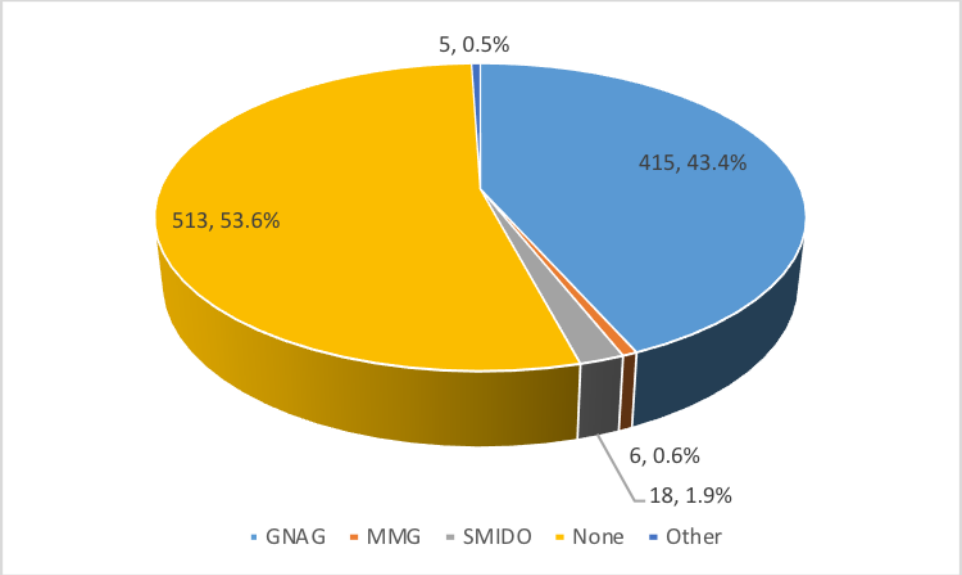

Figure 4: Distribution of artisans by affiliated association

Source: Field survey (2016)

Discussion of findings

The findings of the study demonstrate that there is a huge gender disparity among the auto-artisans. For instance, females constitute only 0.3 percent of the respondents. This finding indicates that auto artisanship in Suame Magazine is dominated by males. This may be due to the manly nature of the auto-artisanal, trades and confirms the findings by Human Sciences Research Council (HSRC) (2014) that gender inequality is common among artisans. HSRC (2014) reported that in a study conducted in South Africa, males outnumbered females significantly in artisanship. This finding also supports that of Shaikh, Shaikh, and Sahib (2012) and Amfo-Otu and Agyemang (2017) that the majority of artisans in the auto industry in Ghana and elsewhere are males. The low involvement of females in artisanship found by the current study is also consistent with the finding of Kumah et al. (2011), which showed that all the welders who participated in a study of artisans in

Suame Magazine were males. It also confirms an earlier study which concluded that males tend to select themselves into more hazardous jobs and females are assigned less physically demanding jobs (Sabitu, Iliyasu & Dauda, 2009). The low participation of females in auto artisanship may also be because of the unequal access to education and apprenticeship females received as compared to their male counterparts or the workplace culture which consists of prejudice, gender discrimination and stereotypical barriers against females in seemingly male vocation (Teti, 2016).

The finding indicating low number of work-and-pay artisans can be explained by the fact that work-and-pay position is transitory. Artisans in this category are mainly transitioning from apprenticeship to master craftsmen and are usually made up of apprentices who have completed their training but have not been able to set up their own shops. They therefore remain with their masters to mobilise funds to be able to establish their own workshops and work as master artisans. The practice of "work-and-pay" is carried out especially in occupations such as spraying and body straightening where working from home or provisional places is impossible or difficult (Schraven, et al., 2013).

It is also observed from the study that fitting dominates the artisanal trades at the enclave. The dominance of mechanics (fitters) among the auto-artisans at the Suame Magazine enclave can be associated with ready market and availability of clients or customers. It can also be due to the fact that setting up a fitting shop does not usually demand much capital and space.

The results from Table 5 indicates that a greater percentage of the respondents (73.5%) were less than 40 years. This indicates that the youth have

taken to artisanship in the auto-mobile industry for a livelihood which also makes the auto-artisanship trade at Suame Magazine and Ghana in general sustainable. This finding confirms that of Monney et al. (2014) which concluded that many vehicle repair artisans in Ghana are less than 40 years.

The results revealed that 0.7% of the respondents had completed tertiary education. This finding is inconsistent with that of Adeya (2006) which found that none of the artisans at Suame Magazine had completed tertiary education. It, however, suggests that auto-artisanship is becoming attractive to tertiary graduates. It must also be due to the mass unemployment situation in Ghana especially among graduates from tertiary institutions. The mass unemployment must have compelled these graduates to become auto-artisans. This current study however confirms that of Adeya (2006) that the majority of the auto-artisans at Suame Magazine (over 90% in both studies) have attained basic or secondary education.

The study explored the income of respondents because according to Horowitz and McConnell (2003), WTP is a function of income. In addition, Barbier, Czajkowski and Hanley (2017) and Akhtar, Saleem, Nadeem Shahid and Ikram (2017) posit that WTP varies according to income, and as a result, the income level of artisans have the potential to influence their WTP for OHS.

The study observed that master artisans earn higher incomes than work-and-pay artisans and apprentices. For example, while 35.7 percent of master artisans said they earn 400 GHS and above, only 10 percent of work-and-pay artisans said they earn that much. This finding was expected because the

master artisans often own the workshops and as a result benefit more from any financial inflows to the enterprise and also bear all the expenses in the shop.

The results also indicated that the majority of respondents had more than ten years' experience in artisanship. This finding shows a combination of fresh and experienced workforce at Suame Magazine. The finding is in line with that of Kumah et al. (2011) who found that 51.5 percent of the welders in Suame Magazine had worked as artisans for more than 10 years. It further confirms the findings of Ajani, Ajibola, Salau, Odufuwa and Odewabi (2011) which indicated that the majority of the mechanics in Nigeria have worked as artisans for periods above ten years. The finding seems to suggests that auto artisanship is considered a life-time vocation for many people since from the data 2.5 percent of the respondents were aged 60 years and above.

The finding of the study which indicates that cumulatively, 22.4 percent of the apprentices have been in apprenticeship for more than ten years is worrisome. This suggests that there is no fixed number of years for an individual to complete training as an auto-artisan. This finding is in line with the findings of Asamani (2010) which concluded that the number of years for apprenticeship training in Ghana often goes beyond 10 years. The finding that 77.6 percent of the apprentices had spent between 1 and 10 years on their trades also confirms that of Anokye and Afrane (2014) which found that about 76 percent of all the apprentices in the various trades they studied were supposed to spend between three and four years as apprentices with their masters. The finding of the present study which suggests that apprentices spend varying number of years learning a trade is also consistent with those of the Anamuah-Mensah Committee report of 2002 as captured in Republic of

Ghana (2002:82) that the duration of apprenticeship training varies depending on the type of trade. The long years auto-artisans spent in apprenticeship training may be because there is no common curriculum used by master craftsmen in training their apprentices as suggested by the Report of the President's Committee on Review of Education Reforms in Ghana (Republic of Ghana, 2002). It might also be because apprentices do not have the resources to establish their own workshops and so remain and work with their masters as apprentices until they are ready to set up their own workshops. It is therefore important for further investigation to identify the reasons for the long apprenticeship period among auto-artisans in Ghana.

The finding indicating that many (53.6%) respondents do not join any of the labour associations at the enclave defeats the purpose for which the associations were formed and minimises the negotiation strength of the associations as indicated by Adeya (2006). According to Adeya, the associations were formed to act as a communication channel between the government and the artisans; and to deliver assistance and programmes, share information relevant to enhancing their business practices and be able to influence policy development relevant to their activities. Due to the above, it was expected that majority of the artisans would join these associations to strengthen the negotiating powers of the associations.

The current finding that 93.5 of the respondents who said they belong to an association are members of the Ghana National Associations of Garages is a deviation from the findings by Adeya (2006) which suggested that the MMA has about 98 percent of all auto-artisans in Suame Magazine as its members. The difference in the two studies which span a period of a little over

a decade is too wide and needs further investigation to establish reasons for the change. It is possible that the auto-artisans at the enclave now find the GNAG more relevant to their needs than the MMA and hence the change of membership.

Summary

The chapter profiled the auto-artisanal trades at Suame Magazine. In all, 29 artisanal trades were identified and grouped into Auto mechanics, auto-body works and ancillary works. It was also found that activities of the artisans were based on a hierarchy made up of master artisans, work-and-pay artisans and apprentices. Sex composition is 99.7 percent males, with the age of respondents ranging from 15 years to 71 years. The majority of respondents does not belong to any of the auto artisanal trades at the enclave.

CHAPTER SIX

ORIENTATION ON OHS AND AWARENESS OF OCCUPATIONAL HAZARDS AND SAFETY

Introduction

This chapter presents OHS orientation the respondents received as a form of educational intervention, and discusses the relationship between orientation on OHS artisans received and awareness of occupational hazards. It also looked at the relationship between orientation and perception of the risky nature of their jobs. It also examined the relationship between socio-demographic characteristics of respondents and their awareness of workplace hazards. The chapter also considered respondents' awareness of circumstances which can lead to workplace injuries and illnesses.

Orientation on workplace safety

The study examined the orientation respondents received on OHS the on their admission as auto-artisans and the relationship between the orientation received and WTP for OHS services as well as their health and safety practices. The orientation on workplace safety auto-artisans received was used as an educational module because, according to Albert, Hallowell and Kleiner (2014), pre-job safety meetings and discussions are among the best practices vital for workplace hazard identification. Ramos, Fuentes and Trinidad (2016) have also argued that orientation and training on workplace safety are necessary for workers who are new to an industry. Similarly, Sari (2009) has

stated that orientation on workplace safety given to newly employed workers is important to their health and safety at the workplace. It has also been posited that workers who are given adequate orientation on occupational safety are less likely to suffer workplace injuries and illnesses (Engkvist et al., 2000).

When respondents were asked if they received any orientation on OHS when they were first admitted as auto-artisans, nearly 79 percent responded in the affirmative indicating they received orientation on OHS. All the respondents who claimed to have received orientation on workplace safety said the orientation was organised by their master artisans. No statistically significant association was found between socio-demographic characteristics of respondents (age F (5)N=957, 3.99, p=0.561), level of education (χ^2 (4) N=957, 2.77; p=0.595), occupational status (χ^2 (2) N=957, 3.72; p=0.155), as well as, type of trade (χ^2 (2) N=957, 1.73; p=0.420) and membership of association (F (4)N=957, 6.73, p=0.122) and orientation they received.

Orientation on OHS and awareness of workplace hazards

As has been stated earlier, Friese et al. (2015) have suggested a positive relationship between educational intervention on safety and awareness of OHS hazards. The study therefore tested the hypothesis that "*there is no statistically significant association between workplace safety orientation and awareness of workplace hazards*". This was against the alternative hypothesis that "*there is statistically significant relationship between workplace safety orientation and awareness of workplace hazards*". This hypothesis became necessary because there was the need to establish whether the workplace safety orientation auto-artisans received could provide the needed awareness on workplace safety. For

awareness of workplace hazards, the study asked the respondents about their awareness of the possibility of suffering workplace injuries and illnesses and their awareness of circumstances which have the potential to lead to workplace injuries and illnesses. Respondents were also asked to state at least three circumstances which could expose them to workplace injuries and illnesses.

From Table 5, it was observed that almost 8 out of every 10 respondents (78.7%) indicated that they received orientation on workplace safety when they were first admitted as auto-artisans. It was revealed that 97.9 percent of those who said they had received orientation on workplace safety indicated awareness of circumstances which can expose them to workplace injuries and illnesses A chi-square test of independence (χ^2 (1) N=957, 9.86; p=0.002) revealed a statistically significant association between orientation on workplace safety and awareness of circumstances which could lead to workplace injuries and illnesses. While 97.9 percent of respondents who received orientation on workplace safety claimed awareness of workplace hazards, 93.6 percent of those who did not received any orientation on OHS said they were aware of workplace hazards. With respect to respondents' awareness of the possibility of suffering occupational injuries and illnesses, differences were found between those who received orientation on workplace safety and those who did not receive any orientation. For example, 96.3 percent and 93.1 percent of the respondents who received orientation and those who did not respectively expressed awareness of the possibility of suffering workplace injuries and illnesses. However, a chi-square test of independence (χ^2 (1) N=957, 3.78; p=0.052) revealed that the differences were not statistically significant.

Table 5: OHS orientation received and awareness of workplace hazards

Awareness		Orientation received			Test/p-value
		Yes(%)	No(%)	Total (%)	
Awareness of circumstances which can lead to occupational injuries	Yes	97.9	93.6	928(97.0)	$\chi 2 = 9.86$
	No	2.1	6.4	29(3.0)	$p = 0.002$
Total		100	100	957(100)	
Awareness that you can suffer workplace injuries or illnesses	Yes	96.3	93.1	915(95.6)	$\chi 2 = 3.78$
	No	3.7	6.9	42(4.4)	$p = 0.052$
Total		100	100	957(100)	

Source: Field Survey (2016)

Orientation on OHS and perception of risky job

Every occupation or profession is associated with some level of risk. The relationship between educational intervention and perception of risky job has been documented (Geer et al., 2007; Friese et al, 2015). The study examined the relationship between the orientation on workplace safety respondents received as a form of educational intervention and their perception of how risky their jobs are. This is because it is believed that perception of risky job can influence the OHS practices of workers. For perceived risk of job, the study asked respondents whether they consider their job to be risky and whether they find their workplaces safe.

It is observed from Table 6, that 95.7 percent of the respondents who received orientation on workplace safety perceived their job to be risky while 4.3 percent indicated that their work was not risky. This was subjected to a chi-square test of independence which produced a result of (χ^2 (1) N=957, 0.24, p=0.623), indicating no statistically significant association between orientation on workplace safety and perception of risky job.

However, a statistically significant relationship (χ^2 (1) N=957, 5.29, p=0.021) was found between orientation on OHS and perception of safety workplace (Table 6). For example, 89.6 percent of the respondents who said they received orientation perceived their workshops as safe compared to 83.6 percent of those who did not receive orientation yet said their workshops are safe for their health.

Table 6: Relationship between OHS orientation and perception of risky job

Organisational factors		OHS orientation		Total	Test/p-value
		Yes (%)	No (%)	N (%)	
Perceived risky job	Yes	95.9	95.1	916(95.7)	χ^2 = 0.24
	No	4.1	4.9	41(4.3)	p = 0.623
Total		100	100	957(100)	
Safe workplace	Yes	89.6	83.6	846(88.4)	χ^2 =5.29
	No	10.4	16.4	111(11.6)	p = 0.021
Total		100	100	957(100)	

Source: Field Survey (2016)

A chi-square text of independence was performed to establish the association between socio-demographic characteristics of respondents and their perception of the risky nature of their job. The results showed a statistically significant association (χ^2 (1)N=957, 4.69, p=0.030) between being a member of a labour association and perception of risky job. Respondents who claimed to be members of a labour association were found to likely perceive their jobs as risky (97.3%) as compared to those who were not members of any of the labour associations (94.4%).

Table 7: Socio-demographic characteristics and perception of risky job

Socio-demographic characteristics	Freq.	Yes	No	Test statistic	P-value
Age in years					
Less than 20	78	93.6	6.4	F= 7.89	0.216
20 – 29	342	94.4	5.6		
30 – 39	283	97.9	2.1		
40 – 49	170	94.7	5.3		
50 – 59	60	98.3	1.7		
60 – 69	21	95.2	4.8		
70 and above	3	100	0.0		
Educational level					
No formal education	64	100	0.0	F= 9.09	0.047
Primary	107	97.2	2.8		
JHS/Middle school	633	95.9	4.1		
SHS/Secondary/Technical	146	92.5	7.5		
Tertiary	7	87.5	12.5		
Marital status					
Never married	470	94.0	6.0	F= 12.00	0.041
Married	428	97.7	2.3		
Co-habitation	49	95.9	4.1		
Separated	7	85.7	14.3		
Divorced	2	100	0.0		
Widowed	1	100	0.0		
Occupational status					
Master artisan	443	96.8	3.2	F= 3.25	0.172
Work and pay artisan	28	92.9	7.1		
Apprentice	486	94.9	5.1		
No. of years engaged in artisanship					
1-10	468	94.2	5.8	F= 6.86	0.239
11-20	284	76.8	3.2		
21-30	134	96.3	3.7		
31-40	56	100	0.0		
41-50	14	100	0.0		
51 – 60	1	100	0.0		
Type of artisan trade					
Auto mechanic	240	96.2	3.8	χ^2=0.23	0.889
Auto body works	527	95.7	4.3		
Ancillary works	190	95.3	4.7		
Average weekly income (Ghs)					
0-99	146	95.2	4.8	χ^2= 1.74	0.783
100-199	208	96.6	3.4		
200-299	156	95.5	4.5		
300-399	137	97.1	2.9		
400 and above	310	94.8	5.2		
Membership of association					
Yes	438	97.3	2.7	χ^2 = 4.69	0.030
No	519	94.4	5.6		
Total	957	95.7	4.3		

Source: Field survey (2016)

Similarly, a statistically significant association was found between formal education and perception of risky job F (4)N=957, 9.09, p=0.047. The results suggest that the lower the formal education attained by a respondent, the more he or she perceives his or her job as risky. However, no statistically significant association was found between perception of risky job and the all the other socio-demographic characteristics (age, marital status, occupational status, experience, type of trade and income).

Awareness of OHS hazards among auto-artisans

Workers are exposed to a variety of hazards before and during work. Awareness of these hazards is a step towards reducing them (Sabitu et al., 2009) and therefore ensuring safety. The study, therefore, sought to identify the awareness of occupational hazards associated with auto-artisanal trade at Suame Magazine.

When respondents were asked whether they were aware of hazards associated with their work, all of them (100%) answered "Yes". They were again asked to state at least three of the hazards they face in relation to their trade. Out of the 957 respondents, the majority (96%) were able to mention at least three hazards to indicate awareness of occupational hazards. Injuries from sharp objects, inhaling dust particles, objects falling on head or body, inhaling smoke and fumes, as well as general burns among others were mentioned. Out of the various hazards, 80 percent identified injuries from sharp objects as the most common occupational hazard they face, followed by inhaling dust particles (44.2%), objects falling on head or body (40.9%), inhaling smoke and fumes (26.6%) and general burns (21%). Another 6.2 percent and 9.2 percent

of the respondents identified chemical burns and inhaling harmful chemicals respectively as the major occupational hazards they face.

Socio-demographic characteristics and awareness of occupational injuries

The study sought to establish the level of awareness of occupational injuries and illnesses in relation to the socio-demographic characteristics of the respondents and a Fisher's Exact Test was performed. The results show that there was no statistically significant relationship between any of the socio-demographic characteristics of respondents and their awareness of occupational injuries and illnesses.

The study again sought to establish the awareness of circumstances which lead to workplace injuries and illnesses among auto-artisans. Table 8, shows that 97 percent of respondents demonstrated awareness of circumstances which can lead to workplace injuries and illnesses by stating at least three of the circumstances which can expose them to workplace injuries and illnesses.

Table 8: Awareness of circumstances which can lead to workplace injuries and illnesses

Awareness	Frequency	Percentage
Yes	928	97.0
No	29	3.0
Total	957	100.0

Source: Field Survey (2016)

A chi-square text of independence was performed to establish the relationship between socio-demographic characteristics of respondents and their awareness of circumstances leading to workplace injuries and illnesses.

The results (F= 10.21 p=0.028), as presented in Table 9, show that there were association between the educational status of respondents and their awareness of circumstances which could lead to occupational injuries at the garage. Respondents who had higher education (tertiary [100%] and secondary education [97.9%]) exhibited slightly higher levels of awareness of circumstances that expose them to occupational injuries at the workshop as compared to those who had junior high school (97.3%) primary (93.5%) and no form of formal education (88.1%).

Similarly, Table 9 shows that respondents (mostly master artisans) who earned an average weekly income of Gh¢ 200 and above (Gh¢200-299-98.7%, Gh¢300-399-95.6% and Gh¢400 and above-97.4%)) were more aware of circumstances which could lead to occupational injuries as compared to those who earned below Gh¢ 100 per week (Gh¢0-99-94.5%, Gh¢100-199-94.7%. This relationship was confirmed significant by the Fisher Exact test (F= 7.45, *p*=0.027) indicating a statistically significant relationship between income and awareness of circumstances leading to workplace injuries.

However, there was no statistically significant association between the age of respondents (F(6) N=957, 6.911, *p*=0.394), marital status (F(5) N=957, 7.667, *p*=0.232), occupational status (F(2) N=957, 4.612, *p*=0.096), number of years of experience (χ^2 (5) N=957, 6.095, *p*=0.326), type of artisanal trade (χ^2 (2) N=957, 0.262, *p*=0.247) and awareness of circumstances that could lead to occupational injuries.

Table 9: Respondents' Socio-demographic characteristics and their awareness of circumstances which can lead to occupational injuries

Socio-demographic characteristics	N	Yes	No	Test statistic	P-value
Age in years					
Less than 20	78	98.1	1.3	F= 6.91	0.394
20 – 29	342	97.1	2.9		
30 – 39	283	97.2	2.8		
40 – 49	170	95.9	4.1		
50 – 59	60	96.7	3.3		
60 – 69	21	100	0.0		
70 and above	3	66.7	33.3		
Educational level					
No formal education	64	89.1	10.9	F= 10.21	0.028
Primary	107	93.5	6.5		
JHS/Middle school	633	97.3	2.7		
SHS/Secondary/Technical	146	97.9	2.1		
Tertiary	7	100	0.0		
Marital status					
Never married	470	97.7	2.3	F= 7.66	0.232
Married	428	96.5	3.5		
Co-habitation	49	95.5	4.1		
Separated	7	85.7	14.3		
Divorced	2	100	0.0		
Widowed	1	100	0.0		
Occupational status					
Master artisan	443	96.2	3.8	F= 4.61	0.096
Work and pay artisan	28	92.9	7.1		
Apprentice	486	97.9	2.1		
No. of years engaged in artisanship					
1-10	468	97.2	2.8	F=6.09	0.326
11-20	284	77.1	22.9		
21-30	134	97.8	2.2		
31-40	56	100	0.0		
41-50	14	92.9	7.1		
51 – 60	1	100	0.0		
Type of artisan trade					
Auto mechanic	240	97.9	2.1	χ^2=0.26	0.247
Auto body works	527	97.2	2.8		
Ancillary works	190	95.3	4.7		
Average weekly income (Ghs)					
0-99	146	94.5	5.5	F= 7.45	0.027
100-199	208	94.7	5.3		
200-299	156	98.7	1.3		
300-399	137	95.6	4.4		
400 and above	310	97.4	2.6		
Total	957	97.0	3.0		

Source: Field survey (2016)

Experience of previous workplace injuries and illnesses

The study examined previous workplace accidents experienced by respondents and their awareness of circumstances which lead to workplace injuries and illnesses. The results demonstrated that about 9 out of every 10 respondents (92.0%) said they had experienced an accident at the workplace in the past. A chi-square test of independence was performed to assess the relationship between previous workplace injuries and illnesses and awareness of circumstances which could expose respondents to workplace injuries and illnesses

Table 10: Previous accident experience and awareness of circumstances leading to workplace injury

Previous accident Experience		Awareness of illnesses and injury causing circumstances		Total (%)
		Yes (%)	No (%)	
Ever had accident	Yes	857(97.4)	23(2.6)	880 (92.0)
	No	71(92.2)	6(7.8)	77 (8.0)
Total		928 (97.0)	29 (3.0)	957 (100)

χ^2 (1, N=957, 6.462, p=0.024)
Source: Field survey (2016)
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It emerged that there was a statistically significant association (χ^2 (1) N=957, 6.462, p=0.024) between previous accident experiences and awareness of circumstances which could lead to occupational injuries or illnesses. It was found from Table 10 that the majority (97.4%) of the respondents who had experienced previous accidents indicated clear awareness of circumstances leading to occupational injuries or illnesses than those who had never been involved in an accident at their workplace (92.2%).

Witnessing workplace accidents and awareness of circumstances leading to workplace injury

The study examined whether witnessing a workplace accident leads to awareness of circumstances which could lead to workplace accident. It is observed from Table 11 that 84 percent of the respondents said they had ever witnessed an accident at their workshop, and that the majority (97.6%) of the respondents who had ever witnessed workplace accident were also aware of circumstances which can lead to occupational injuries or illnesses compared to those who said they had never witnessed any accident at their workplace (93.6%). A Chi-square test of independence, (χ^2 (1) N=957, 7.246, p=0.017) revealed a statistically significant relationship between witnessing workplace accidents and awareness of circumstances which can lead to occupational injuries or illnesses at the workplace.

Table 11: Witnessing workplace accident and awareness of circumstances leading to workplace injury

Workplace accident		Awareness of illness and injury causing circumstances		Total (%)
		Yes (%)	No (%)	
Ever witnessed an accident	Yes	782(97.6)	19(2.4)	801(84%)
	No	146(93.6)	10(6.4)	156(16%)
Total		928(97.0)	29(3.0)	957 (100%)

χ^2 (1, N=957, 7.246, p=0.017)
Source: Field survey (2016)

Discussion of findings

The results from the study indicate that a greater proportion of respondents received orientation on workplace safety upon their admission as apprentices. This suggests that auto-artisans at Suame Magazine consider OHS important, hence providing training on workplace safety to new entrants in the

form of orientation on workplace safety which is in line with WorkSafeNB (2014) position that people who are new at their job need orientation on workplace safety. Again, orientation on workplace safety auto-artisans received has the potential to determine their workplace safety practices such as use of PPE as stated by the conceptual framework and Friese et al. (2015). The high proportion of respondents (79%) who said they received orientation on workplace safety as established by this study is good for the safety of the auto-artisans since it would create awareness on health and safety hazards associated with job, identify controls for these hazards and how the hazards can affect their safety (WorkSafeNB, 2014).

The finding of no statistically significant association between socio-demographic characteristics of respondents and provision of orientation on workplace safety is noteworthy. It indicates that the provision of orientation on OHS at Suame Magazine does not depend on one's personal characteristics. It demonstrates that all new entrants, irrespective of their educational background, age, or the type of trade engaged in, orientation on OHS is organised for the person as suggested by Smith and Mustard (2007). Similarly, the findings that provision of orientation on workplace safety is not based on membership of labour association suggests the auto-artisans at Suame Magazine consider orientation and training on workplace safety important and a part of general safety measure as suggested by Beach (1985) that any effective workplace safety programme must consider orientation and training on workplace safety as important aspects. One would have however thought that provision of orientation on workplace safety would be based on membership of a labour association since most of the time, training sessions

are organised by the labour unions (Okoye, Ezeokonkwo & Ezeokoli, 2016) and therefore artisans who do not belong to the associations do not benefit from such training. However, in the case of Suame Magazine, orientation on workplace safety is organised for new entrants by individual master craftsmen or shop owners based on workplace safety culture and ethics existing at the workshop and as a result, does not depend on the labour association one belongs to.

It has been documented that effective knowledge and awareness of risk factors and safety hazards among workers can prevent workplace accidents (Ferguson, 2001; Kumar & Bansal, 2013). In the current study, it emerged that there was a high awareness of workplace hazards among auto-artisans. This can reduce accident rate among the artisans because according to Taufek, Zulkifle and Kadir (2016), most workplace accidents employees suffer are due to lack of awareness of hazards. The statistically significant association found between orientation on workplace safety artisans received and awareness of workplace hazards is an indication that the orientation on workplace safety provided to new entrants is adequate to create awareness of workplace hazards among auto-artisans. It also conforms to the conceptual framework for the study which predicts a relationship between educational module in the form of orientation and awareness of workplace hazards. Based on the findings, the study rejected the hypothesis that "*there is no statistically significant relationship between orientation on workplace safety artisans received and their awareness of workplace hazards*".

The current finding suggesting a statistically significant association between orientation received by artisans and awareness of circumstances

which could expose them to workplace injuries and illnesses demonstrates the importance of training on workplace safety in identifying injury causing circumstances. This finding supports an earlier one by Sokas, Jorgensen, Nickels, Gao and Gittleman (2009) who reported a significant relationship between educational intervention on workplace safety and awareness of circumstances leading to occupational injuries among artisans in construction sites. It also confirms Hallowell and Gambatese's (2009) study which stresses that pre-job safety meetings and discussions are important for improved workplace hazard awareness. It is also in line with the finding by Sokas et al. (2009) that educational training on workplace safety increases the awareness of workplace hazards among workers.

The findings that perception of risky job is associated with membership of labour association or union is likely because the labour associations organise training on OHS for their members which may include perception of risky job. This finding signifies the importance of the labour unions at the enclave regarding the health and safety of artisans. However, the finding that the lower the educational attainment of an artisan, the more he or she perceives his or her job as risky is surprising. This may be because auto-artisans with higher education take safety precautions and therefore do not consider their jobs as risky. This is however dangerous, as it has the potential to lead to complacency causing them to lose guard and get injured. This finding contradicts that of You, (2011); Pádua et al. (2013) which posits that formal education plays a role in risk perceptions and states that higher educational attainment leads to higher perception of risk.

The results indicate that there exists awareness of the possibility of falling sick or getting injured from work related accidents among respondents. This awareness could likely lead auto-artisans to take precautionary measures to ensure safety at their workplaces. It could also ensure the effective use of PPE by auto-artisans. This finding is consistent with other studies (Tadesse et al., 2016; Budhathoki et al., 2014; Kumar et al., 2013) which found that awareness of occupational health hazards tends to be high among professionals in the informal economy, especially artisans. Similarly, the current finding supports that of Pui et al. (2017) which concluded that their study participants were aware of occupational hazards and concerned about their exposure to the hazards.

The study also established that awareness of circumstances leading to occupational injuries among respondents was high. This is in line with other studies such as Budhathoki et al. (2014), Kumar et al. (2013) and Diwe et al (2016) which found awareness of occupational hazards and use of safety measures among some categories of workers to be very high. For instance, Budhathoki et al. (2014) posited that awareness of occupational hazards among welders in India was over 90 percent. This means that the majority of the respondents knew the various circumstances which could expose them to occupational injuries. The high level of awareness of hazards would lead respondents to act to prevent accidents and injuries associated with their work.

Regarding the relationship between level of education and awareness of workplace hazards, a chi-square test of independence ($\chi 2$ (4) N=957, 3.338, p=0.466) revealed that there was no statistically significant association between the two. This is because irrespective of the educational attainment of

an auto-artisan, orientation on workplace safety was provided to all new entrants; hence, they all become aware of workplace hazards. This finding is contrary to the conceptual framework of the study, which asserts that personal characteristics of workers such as education have an association with awareness of workplace hazards. Possibly, awareness of workplace hazards might have been created through the orientation they received on workplace safety and not due to one's level of formal education.

This current finding confirms that of Ahmad (2017) who found no relationship between level of education and awareness of occupational hazards among mine workers in Rajasthan, India. It however contradicts an earlier observation by Budhathoki et al. (2014), Tadesse et al. (2016) and Diwe et al. (2016) indicating significant associations between attainment of higher education and awareness of occupational hazards. It further contradicts the DEFENS Study conceptual framework (2015) adapted for the study which suggests that formal education influences the level of awareness of workplace hazards among workers.

The chi-square test of independence ($\chi 2$ (5) N=957, 3.136, p=0.756) which indicated no statistically significant relationship between number of years spent as an artisan and awareness of occupational hazards means that awareness of workplace hazard was not based on ones' experience but other factors such as orientation on workplace safety received and perception of risky job. This finding does not support that of Tadesse et al. (2016) which concluded that awareness level of occupational hazards and its associated factors among artisans was significantly associated with work experience.

However, a Chi-square test of independence ($\chi 2$ (4) N=957, 10.21, p=0.0280) conducted demonstrated that there was a statistically significant association between formal education and awareness of circumstances leading to workplace injuries and illnesses. This finding was expected because there is the common perception that literacy (formal education) leads to awareness of what can expose workers to injuries and illnesses (Budhathoki et al., 2014), Marahatta et al., 2018). The current study has established that apart from education ($\chi 2$ (4) N=957, 10.21, p=0.0.0280) and level of income ($\chi 2$ (4) N=957, 7.45, p=0.027) other background characteristics do not influence awareness of occupational hazards as well as awareness of circumstances leading to workplace injuries and illnesses. The finding of a statistically significant association between previous accident experience and awareness of workplace hazards found by this study confirms that of Mearns, Flin, Gordon and Fleming (1998) that workers who had experienced past accidents or incident at the workplace become more aware of workplace hazards and risk than those who had no previous workplace accident experience

It emerged from the study that 78.7 percent of respondents perceived their job as risky, which may to lead to increased PPE use and the adoption of other safety measures among the auto-artisans as suggested by the conceptual framework adapted for the study (Friese et al, 2015). This is because when one perceives his or her job to be risky there is the likelihood that they would take precautionary measures to prevent accidents or injuries which include the use of PPE.

However, a chi-squire test result found no statistically significant association between orientation on workplace safety received and perception of

risky job. This finding suggests that irrespective of orientation received, artisans at Suame Magazine were able to perceive how risky or otherwise their job is. This is strange and unexpected because one would expect that orientation on workplace safety would influence the perception of risky job as suggested by the conceptual framework employed by the study and Friese et al. (2015). This may however mean that, auto-artisans at Suame Magazine have similar perception of the risky nature of their job whether they received orientation and training on workplace safety or not. This is a further indication that both auto-artisans who received orientation and those who did not would equally take actions to ensure safe workplaces. Based on this finding, there is no basis to rejects the hypothesis which states "*there is no relationship between orientation on workplace safety artisans received and perceived risky job among auto-artisans*".

The finding of a statistically significant association between OHS orientation respondents received and their perception of safe workplace means that artisans who received orientation are more likely to perceive their workshops safe than those who did not receive any orientation. This can influence workplace safety practices both positively and negatively. The first probable explanation is that because they perceive their workshops as being safe, they may continue to keep them safe by applying safety measures such as good house-keeping and cleanliness. The second possibility is that because they see their workshop to be safe, they would be complacent and would not implement safety practices such as using PPE. This finding corroborates an earlier one by Cavazza and Serpe (2010) that attendance of OHS training positively influences the perception of better workplace safety climate

including safe workplace. This finding is also in line with Friese et al. (2015) DEFENS framework which predicts that orientation on workplace safety received by workers leads to enhanced awareness of workplace hazards.

Summary

The chapter assessed orientation on OHS and awareness of occupational hazards among auto artisans at Suame Magazine. It was found that auto-artisans at Suame magazine provide orientation on OHS to new entrants, especially new apprentices. The orientation is organised by master craftsmen. A statistically significant association was found between orientation received and awareness of injury causing circumstances. Again, the association between previous accident experience and awareness of injury causing circumstances was found to be statistically significant. However, the study did not find a statistically significant association between orientation on OHS and perception of risky job.

CHAPTER SEVEN

OCCUPATIONAL HEALTH AND SAFETY PRACTICES AMONG AUTO-ARTISANS

Introduction

This chapter presents the OHS practices among artisans at the Suame Magazine enclave. It discusses the relationship between socio-demographic characteristics of respondents and safety practices such as the use of PPE, inspection of vehicles and vehicle parts before working on them and meeting with colleagues to discuss issues relating to OHS.

Workplace safety practices

Ensuring safety at the workplace is a step at preventing accidents and injuries because in the view of Taufek et al. (2016), safety is about what can be done or actions taken to protect workers from injuries and diseases. Respondents were asked whether they deliberately act to ensure safety at their workplaces. The results indicated that 67 percent of the respondents take various actions to ensure safety. To confirm this, an observation was carried out and it emerged that auto-artisans take various deliberate actions to ensure their safety at the workshop. Some of the actions include immediate cleaning of unavoidable spills on working tables, proper arrangement of working tools, concentrating on the job by the artisans. However, most of the workshops were not properly kept leading to poor house-keeping. For example, vehicle parts were scattered all over the workshop making movement difficult when working (See Figure

5). This was because there were no cabinets for packing and arranging working tools and vehicle parts.

Figure 5: Vehicle parts scattered around in a workshop at Suame Magazine
Source: Fieldwork (2016)

Table 12 shows that there were differences among the age categories, educational level, marital status, occupational status, number of years engaged in artisanship income and association affiliation of the respondents and actions taken to ensure safety. However, these differences and possible associations were only significant among age categories (χ^2 (6) N=957, 14.28, p=0.027) and membership of an association (χ^2 (1) N=957, 9.47, p=0.002) of the respondents and action taken to ensure safety.

Table 12: **Socio-demographic characteristics and action taken to ensure safety**

Socio-demographic characteristics	Action taken to ensure safety				
	N	Yes	No	Test statistic	P- value
Age in years					
Less than 20	78	52.6	47.4	χ^2=14.28	0.027
20 – 29	342	65.2	34.8		
30 – 39	283	71.0	29.0		
40 – 49	170	70.0	30.0		
50 – 59	60	70.0	30.0		
60 – 69	21	81.0	19.0		
70 and above	3	33.3	66.7		
Educational level					
No formal education	64	60.9	39.1	F= 3.290	0.513
Primary	107	63.6	36.4		
JHS/Middle school	633	68.6	31.4		
Secondary/Technical	146	66.4	33.6		
Tertiary	7	85.7	14.3		
Marital status					
Never married	470	66.0	34.0	F= 6.147	0.252
Married	428	68.9	31.1		
Co-habitation	49	61.2	38.8		
Separated	7	100	0.0		
Divorced	2	50.0	50.0		
Widowed	1	100	0		
Occupational status					
Master artisan	443	70.7	29.3	χ^2= 4.394	0.111
Work and pay artisan	28	67.9	32.1		
Apprentice	486	64.2	35.8		
No. of years engaged in artisanship					
1-10	468	64.1	35.9	F= 6.669	0.225
11-20	284	71.1	28.9		
21-30	134	70.1	29.9		
31-40	56	66.1	33.9		
41-50	14	64.3	35.7		
51 – 60	1	0.0	100		
Average weekly income (Ghs)					
0-99	146	63.7	36.3	χ^2 = 3.34	0.503
100-199	208	68.8	31.2		
200-299	156	62.8	37.2		
300-399	137	69.3	30.7		
400 and above	310	69.4	30.6		
Association					
No	519	63.0	37.0	χ^2= 9.473	0.002
Yes	438	72.4	27.6		

Source: Field survey (2016)

The study considered the meetings by auto-artisans to discuss safety at the workplace as one of the workplace safety practices applied by auto-artisans at Suame Magazine. It emerged that about two-thirds (68.3%) of the respondents said they meet with colleague auto-artisans to discuss issues concerning workplace safety. The study examined the relationship between socio-demographic characteristics of respondents and the act of meeting to discuss workplace safety. The socio-demographic characteristics of interest were age, educational level, marital status, income, occupational status, number of years engaged as an artisan and membership of labour association at the enclave. The results are presented in Table 13.

The table shows that there were association between age of respondents and whether they meet with colleagues to discuss safety issues. For example, it emerged that respondents who were more than 50 years meet to discuss safety issues with their colleagues often as compared to those aged below 50 years. This was investigated with chi-square test of independence and it was found to be statistically significant (χ^2 (1) N=957, 21.6, p=0.001).

On marital status, it was established that there was statistically significant association (F (5) N=957, 14.48, p=0.005) between marital status and respondents meeting with colleagues to discuss safety issues. For example, it was found that respondents who are married (73.1%) meet more with their colleagues to discuss issues relating to health and safety at the workplace than their unmarried (65.1%) counterparts.

With regard to the occupational status of respondents, the results show that there was association between occupational status and respondents' claim to meet with fellow artisans to discuss safety issues. Master artisans (73.6%)

were mostly found to meet with colleagues to discuss safety issues as compared to apprentice artisans (64.8%). This association was statistically significant as indicated by the Fisher Exact test (F (2) N=957, 14.65, p=0.001).

Concerning the working experience of respondents (number of years that respondents had engaged in artisanship), the result shows that there was a statistically significant association between the experience of the respondents and meeting with colleagues to discuss safety issues. Respondents who had long years of working experience as artisans meet colleagues to discuss safety issues more than those who have not been artisans for a long period. It is observed from the Table that respondents who had been artisans for more than 20 years meet with fellow artisans more than those with 20 years or less experience as artisans. For example, while 85.7 percent of respondents who have working experiences between 41 and 50 years said they meet with their fellow artisans to discuss workplace safety, 64.7 percent of these with less than 10 years working experience said so.

The results, however, show that there was no statistically significant association between average weekly income (χ^2 (1) N=957, 0.99, p=0.912), membership of labour union (χ^2 (1) N=957, 0.99, p=0.912), Level of education (F (4) N=957,1.632, p=0.807) and meeting to discuss workplace safety issues

Table 13: Socio-demographic characteristics and meeting colleagues to discuss workplace safety

Socio-demographic characteristics	Meeting with colleagues to discuss safety				
	N	Yes	No	Test statistic	P-value
Age in years					
Less than 20	78	48.7	51.3	$\chi^2 = 21.6$	0.001
20 – 29	342	67.3	32.7		
30 – 39	283	68.6	31.4		
40 – 49	170	74.1	25.9		
50 – 59	60	76.7	23.3		
60 – 69	21	85.7	14.3		
70 and above	3	66.7	33.3		
Educational level					
No formal education	64	64.1	35.9	F= 1.632	0.807
Primary	107	66.4	33.6		
JHS/Middle school	633	68.9	31.1		
Secondary/Technical	146	68.5	31.5		
Tertiary	7	85.7	14.3		
Marital status					
Never married	470	65.1	34.9	F= 14.48	0.005
Married	428	73.1	26.9		
Co-habitation	49	57.1	42.9		
Separated	7	85.7	14.3		
Divorced	2	0.0	100		
Widowed	1	100	0.0		
Occupational status					
Master artisan	443	73.6	26.4	F= 14.65	0.001
Work and pay artisan	28	46.4	53.6		
Apprentice	486	64.8	35.2		
Years engaged in artisanship					
1-10	468	64.7	35.3	F= 12.67	0.012
11-20	284	66.9	33.1		
21-30	134	76.9	23.1		
31-40	56	80.4	19.6		
41-50	14	85.7	14.3		
Above 50	1	100	0.0		
Average weekly income (GHS)					
0-99	146	65.1	34.9	$\chi^2 = 0.99$	0.912
100-199	208	69.7	30.3		
200-299	156	68.6	31.4		
300-399	137	67.9	32.1		
400 and above	310	69.0	31.0		
Association membership					
No	519	69.6	30.4	$\chi^2 = 0.78$	0.378
Yes	438	66.9	33.1		
Total	957	68.3	31.7		

Source: Field survey (2016)

Table 14 shows that 697, representing 72.7 percent said they use PPE as a form of workplace safety practice. This was confirmed from the on-site observation conducted that artisans in every 6 out of ten workshops observed used PPE such as boots, overall coats, nose masks and gloves where applicable (Figure 6). However, it was found during the observation that auto-artisans do not use the full complement of PPE but rather pick and choose those they consider appropriate depending upon the type of trade or the particular job one is performing. It was also established that there were association between the age of respondents and use of PPE. Respondents between the ages of 20 and 49 years were found to be more likely to use PPE (20 to 29=71.6%, 30 to 39=76.7% and for 40 to 49=76.5%) as compared to those aged above 50 years (50 to 59-65.0%, 60 to 69=71.4% and 70 and above 33.3%). This association was confirmed by chi-square test of independence to be statistically significant (F (6) N=957, 12.504, p=0.004).

Similarly, a statistically significant association was found between membership of a labour association of the respondents and their use of PPE, as confirmed by a chi square test (χ^2 (1) N=957, 8.88, p=0.003). Thus, the use of PPE by auto-artisans at Suame Magazine enclave is associated with respondents' affiliation to labour associations. Table 14 shows that 77.4 percent of respondents who belong to a labour association use PPE while a significant proportion (68.8%) of those who do not belong to any of the labour associations said they do not use PPE.

Table 14: Socio-demographic characteristics and use of PPE

Socio-demographic characteristics	Use of PPE				
	N	Yes	No	Test Statistic	*P*- value
Age in years					
Less than 20	78	61.5	38.5	F = 12.504	*p*= 0.044
20 – 29	342	71.9	28.1		
30 – 39	283	76.7	23.3		
40 – 49	170	76.5	23.5		
50 – 59	60	65.0	35.0		
60 – 69	21	71.4	28.6		
70 and above	3	33.3	66.7		
Educational level					
No formal education	64	68.8	31.2	F = 3.588	*p*=0.464
Primary	107	66.4	33.6		
JHS/Middle school	633	73.8	26.2		
Secondary/Technical	146	74.0	26.0		
Tertiary	7	85.7	14.3		
Occupational status					
Master artisan	443	74.7	25.3	F = 2.387	*p*=0.305
Work and pay artisan	28	78.6	21.4		
Apprentice	486	70.6	29.4		
No. of years engaged in artisanship					
1-10	468	70.5	29.5	F= 7.790	*p*=0.150
11-20	284	77.5	22.5		
21-30	134	73.1	26.9		
31-40	56	69.6	30.4		
41-50	14	64.3	35.7		
51 – 60	1	0.0	100		
Average weekly income (GHS)					
0-99	146	71.2	28.8	χ^2 =4.625	*p*=0.328
100-199	208	73.1	26.9		
200-299	156	66.7	33.3		
300-399	137	76.6	23.4		
400 and above	310	74.5	25.5		
Association membership					
No	519	69.6	30.4	χ^2 = 0.78	*p*=0.378
Yes	438	66.9	33.1		

Source: Field survey (2016)

Figure 6: An auto-body sprayer at Suame Magazine wearing only nose mask
Source: Fieldwork (2016)

On the other hand, no statistically significant association was found between the educational level of respondents (F (4) N=957, 3.588, *p*=0.464) and the use of PPE.

A bivariate analysis of the association between background characteristics of the respondents and use of PPE only showed statistical significance for age, and type of artisanal trade. (see Table 15).

Table 15: Bivariate analysis of socio-demographic characteristics and use of PPE

Background characteristic	Use of PPE		χ^2	Pr
	Yes	No		
Age in years			12.63	0.049
Less than 20	61.54	38.5		
20 – 29	71.93	28.07		
30 – 39	76.68	23.32		
40 – 49	76.47	23.53		
50 – 59	65.0	35.0		
60 – 69	71.43	28.57		
70 and above	33.33	66.67		
Marital status			7.40	0.192
Never married	70.0	30.0		
Married	75.47	24.53		
Cohabiting	69.39	30.61		
Separated	100.0	0.0		
Divorced	100.0	0.0		
Widowed	100.0	0.0		
Level of education			3.76	0.439
No formal	68.75	31.25		
Primary	66.36	33.64		
JHS/Middle	73.78	26.22		
SHS/sec/tech	73.97	26.03		
Tertiary	85.71	14.29		
Occupational status			2.50	0.286
Master artisan	74.72	25.28		
Work and pay artisan	78.57	21.43		
Apprentice	70.58	29.42		
Number of years of artisanship			7.82	0.166
1 – 10	70.51	29.49		
11 – 20	77.46	22.54		
21 – 30	73.13	26.87		
31 – 40	69.64	30.36		
41 – 50	64.29	35.71		
51 – 60	0.00	100.0		
Type of trade			14.21	0.001
Autobody works	82.20	17.80		
Mechanic (fitting)	69.80	30.20		
Ancillary services	69.19	30.81		
Weekly income (Ghs)			4.62	0.328
0 – 99	71.23	28.77		
100 – 199	73.08	26.92		
200 – 299	66.67	33.33		
300 – 399	76.64	23.36		
400 and above	74.52	25.48		

Source: Fieldwork (2016)

Binary logistic regression analysis was carried out to identify the association between orientation on OHS and use of PPE (PPE) among the respondents. Three sequential models were run and the results are presented in Table 16.

In Model 1, orientation on OHS was found to have a statistically significant association with use of PPE. Auto-artisans who had orientation on OHS were likely to use PPE as compared to those who did not receive any form of OHS orientation (OR= 1.58 [1.13-2.20]).

In Model 2, witnessing accident or near miss was added to orientation on OHS. However, it showed no statistically significant association with the use of PPE. But the odds for orientation remained virtually the same (OR= 1.58, [1.13-2.21]).

In Model 3, only 'type of artisanal trade' had statistically significant association with PPE. Respondents who were mechanics (fitting) were found to be more likely to use PPE as compared to those who were engaged in autobody works (OR= 0.49, [0.33-0.74]). Similarly, respondents who were into ancillary services were found to be more likely to use PPE compared to those who specialised in autobody works (OR= 0.49, [0.31-0.77]).

Table 16: Logistic regression analysis for use of PPE

	Model 1	Model 2	Model 3
	OR [95% CI]	OR [95% CI]	OR [95% CI]
Orientation			
No	Ref	Ref	Ref
Yes	1.58** [1.13-2.20]	1.58** [1.13-2.21]	1.55* [1.09-2.19]
Witnessing accident			
No		Ref	Ref
Yes		0.97 [0.61-1.53]	0.95 [0.59-1.53]
Age in years			
Less than 20			Ref
20-29			1.43 [0.84-2.44]
30-39			1.39 [0.72-2.66]
40-49			1.08 [0.47-2.47]
50-59			0.58 [0.20-1.63]
60-69			0.84 [0.16-4.27]
70 and above			0.35 [0.01-7.65]
Marital status			
Never married			Ref
Married			1.36 [0.87-2.11]
Cohabiting			0.91 [0.47-1.78]
Level of education			
No formal			Ref
Primary			0.80 [0.40-1.60]
JHS/Middle			1.13 [0.63-2.03]
SHS/Voc/Tech			1.21 [0.61-2.38]
Tertiary			2.29 [0.24-21.83]
Occupational status			
Master artisan			Ref
Work-and-pay			1.20 [0.44-3.28]
Apprentice			0.91 [0.59-1.42]
Number of years of artisanship			
1-10			Ref
11-20			1.30 [0.83-2.02]
21-30			1.05 [0.56-1.96]
31-40			1.28 [0.52-3.18]
41-50			0.94 [0.17-5.01]
51-60			.
Type of trade			
Autobody works			Ref
Mechanic (fitting)			0.49*** [0.33-0.74]
Ancillary services			0.49** [0.31-0.77]
Weekly income (Ghs)			
0-99			Ref
100-199			1.04 [0.63-1.69]
200-299			0.81 [0.49-1.36]
300-399			1.34 [0.77-2.34]
400 and above			1.14 [0.72-1.81]
N	957	957	946

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Fieldwork (2016)

The majority of the respondents (84.7%) said they inspect vehicles and vehicle parts before working on them as a workplace safety practice. This was corroborated by the on-site observation conducted at the workshops which revealed that every eight out of 10 auto-artisans inspected vehicles, vehicle parts and materials they work with to assess hazards before working on them. It was observed that when a vehicle entered workshop, the master artisan would go around the vehicle to inspect it to assess hazards and the safety situation of the vehicle (Figure 7).

Figure 7: An auto-artisan inspecting a vehicle to assess hazard
Source: Fieldwork (2016)

It was established that number of years of working experience is negatively related to inspection of vehicles to assess hazard before working on them. Table 17 reveals that respondents who had more than 30 years working experience inspect vehicles less than their counterparts with less than 30 years working experience. For example, while respondents who have worked between 21 and 30 years (91.0%) said they inspect vehicles 78.6 percent of those with experience between 41 and 50 years indicated they inspect vehicles to assess hazards before working on them. It is further shown in Table 15 that there was an association between respondents' affiliation to a labour association and inspection of vehicles or parts to assess hazards before working on them. It emerged that 91.6 percent of those who belong to a labour association inspect vehicles and vehicle parts before working on them while 79. 0 percent of respondents who do not belong to any labour association said they do not inspect vehicles before working on them.

This association was statistically significant as indicated by chi square test (χ^2 (1) N=957, 28.96, p<0.001). Therefore, the decision on whether respondents inspect vehicles or parts to assess hazards before working on them is related to membership of association. However, no statistically significant association between average income of the respondents' socio-demographic characteristics (see Table 17)

Table 17: **Socio-demographic characteristics and inspection of vehicles**

Socio-demographic characteristics	Inspect vehicles or parts to assess hazards				
	Freq.	Yes	No	Test statistic	P- value
Age in years					
Less than 20	78	84.6	15.4	F = 11.4	0.066
20 – 29	342	82.2	17.8		
30 – 39	283	88.0	12.0		
40 – 49	170	87.6	12.4		
50 – 59	60	83.3	16.7		
60 – 69	21	66.7	33.3		
70 and above	3	66.7	33.3		
Educational level					
No formal education	64	82.8	17.2	F= 2.15	0.692
Primary	107	83.2	16.8		
JHS/Middle school	633	84.4	15.6		
Secondary/Technical	146	88.4	11.6		
Tertiary	7	85.7	14.3		
Marital status					
Never married	470	83.0	17.0	F= 3.2	0.632
Married	428	86.7	13.3		
Co-habitation	49	83.7	16.3		
Separated	7	85.7	14.3		
Divorced	2	100	0.0		
Widowed	1	100	0.0		
Occupational status					
Master artisan	443	85.3	14.7	F = 0.258	0.926
Work and pay artisan	28	85.7	14.3		
Apprentice	486	84.2	15.8		
No. of years engaged in artisanship					
1-10	468	83.1	16.9	F= 12.16	0.026
11-20	284	86.3	13.7		
21-30	134	91.0	9.0		
31-40	56	78.6	21.4		
41-50	14	78.6	21.4		
51 – 60	1	0.0	100		
Weekly income (Ghs)					
0-99	146	84.9	15.1	$\chi^2 = 5.364$	0.252
100-199	208	86.5	13.5		
200-299	156	81.4	18.6		
300-399	137	89.8	10.2		
400 and above	310	82.9	17.1		
Association					
No	519	79.0	21.0	χ^2=28.96	0.000
Yes	438	91.6	8.4		
Total	100.0	84.7	15.3		

Source: Field survey (2016)

Perceived risk of job and safety practices

The study sought to examine the relationship between respondents' perceived risk of their job and workplace safety practices. According to Kerr et al. (2001), one of the highest risk factors for workplace injury is working in a hazardous or risky job. To determine respondents' perceived risk of job, they were asked whether they find their work risky or if they considered their workplace safe for their health. Workplace safety practices considered were, use of PPE, action taken to ensure safety at the workplace, meeting to discuss workplace safety and inspection of vehicles or vehicle parts to assess hazards before working on them.

With a chi-square test of (χ^2 (1) N=957, 9.99 p=0.002, it was found that there was a statistically significant relationship between perception of risky job and use of PPE (see Table 18). Those who considered their job to be risky (73.7%) tended to use more protective equipment than those who indicated their work is not risky (51.1%).

Respondents who found their workshop to be safe (85.7%) also inspect vehicle or vehicle parts before repairing them as compared to those who did not find their workshop safe (77.5%). This association was tested with chi square test of independence and the results (χ^2 (1) N=957, 5.128 p=0.024) revealed that it was statistically significant.

On the other hand, with a chi-square test results of (χ^2 (1) N=957, 0.004, p=0.951 (Table 18), it was found that there was no statistically significant association between respondents who considered their workplace as safe and the use of PPE. It is noted again that no statistically significant relationship was found between perceived safety workplace and action taken to

ensure workplace safety (χ^2 (1), N=957, 0.019 p=0.889), perceived risky job and meeting to discuss workplace safety (χ^2 (1) N=957, 1.073 p=0.300).

Table 18: Perceived risk of job and safety practices

Perception of risky job		Yes	No	Total	Test/p-value
		Use of PPE			
Perceive work as risky	Yes	73.7	26.3	916	χ^2 = 9.99
	No	51.1	48.9	41	p = 0.002
Total		72.7	27.3	957	
Safe workplace	Yes	72.7	27.3	846	χ^2 =0.004
	No	73.0	27.0	111	p = 0.951
Total		72.7	27.3	957	
		Action to ensure safety			
Perceive work as risky	Yes	67.2	32.8	916	χ^2 = 0.019
	No	68.3	31.7	41	p = 0.889
Total		67.3	32.7	957	
Safe workplace	Yes	68.8	31.2	846	χ^2 =7.46
	No	55.9	44.1	111	p = 0.006
Total		67.3	32.7	957	
		meet to discuss safety issues			
Perceive work as risky	Yes	68.7	31.3	916	χ^2 = 1.073
	No	61.0	9.0	41	p = 0.300
Total		68.3	31.7	957	
Safe workplace	Yes	68.6	31.4	846	χ^2 = 0.162
	No	66.7	33.3	111	p = 0.687
Total		68.3	31.7	957	
		Inspection of vehicles			
Perceive work as risky	Yes	84.5	15.5	916	χ^2 = 1.00
	No	90.2	9.8	41	p = 0.317
Total		84.7	15.3	957	
Safe workplace	Yes	85.7	14.3	846	χ^2 =5.128
	No	77.5	22.5	111	p = 0.024
Total		84.7	15.3	957	

Source: Field Survey (2016)

Awareness of workplace hazards and safety practices

Based on the conceptual framework adapted from Friese et al. (2015), the study examined whether awareness of occupational hazards by artisans mediate between the OHS orientation they received and their OHS practices.

Factors used to represent awareness of workplace hazards were, awareness of circumstances which can lead to occupational injuries and awareness of the possibility of suffering workplace injuries and illnesses.

Table 19 shows that about two-thirds (68.1%) of the respondents who claimed awareness of situations which can lead to occupational injuries and illnesses said they act to ensure safety at the workplace. On the other hand, 41.4 percent of respondents who said they are not aware of circumstances which can lead to workplace injuries and illness said that they act to ensure safety at their workplaces. This relationship was found to be statistically significant (χ^2 (1) N=957, 9.13, $p < 0.003$).

It is observed from Table 19 that even though, most of the respondents (73%) who indicated awareness of circumstances which can lead to workplace injuries and illnesses said they use PPE; the association between awareness of circumstances leading to workplace injuries and use of PPE was not found to be statistically significant (χ^2 (1) N=957, 0.748 p=0.376). Much the same way, no statistically significant association were found between awareness of the possibility of suffering workplace injuries and illnesses (χ^2 (1) N=957, 1.498 p=0.221) and the use of PPE.

Again, no statistically significant relationship was found between awareness of the possibility of being exposed to workplace illness or injuries (χ^2 (1) N=957, 0.85 p=0.357) and actions taken to ensure safety. It was established that there was no statistically significant association between respondents who claimed awareness of circumstances that can lead to occupational injuries and illnesses (χ^2 (1) N=957, 2.396, p=0.122) and those

who said they are aware they can suffer workplace injuries or diseases (χ^2 (1) N=957, 0.010, p=0.920).

Table 19: Awareness of workplace hazards and safety practices

Awareness of hazards		Yes	No	Total	Test/p-value
		Use of PPE			
Awareness of disease and injury causing circumstances	Yes	73.0	27.0	928	χ^2 =0.748
	No	65.5	34.5	29	p = 0.376
Total		72.7	27.3	957	
Awareness of suffering workplace injuries or illnesses	Yes	72.3	27.7	915	χ^2 =1.498
	No	81.0	19.0	42	p = 0.221
Total		72.7	27.3	957	
		Action taken to ensure safety			
Awareness of disease and injury causing circumstances	Yes	68.1	31.9	928	χ^2 = 9.13
	No	41.4	58.6	29	p = 0.003
Total		67.3	32.7	957	
Awareness of suffering workplace injuries or illnesses	Yes	67.0	33.0	915	χ^2 =0.85
	No	73.8	26.2	42	p = 0.357
Total		67.3	32.7	957	
		Meet to discuss safety issues			
Awareness of disease and injury causing circumstances	Yes	68.8	31.2	928	χ^2 =2.396
	No	55.2	44.8	29	p = 0.122
Total		68.3	31.7	957	
Awareness of suffering workplace injuries or illnesses	Yes	68.3	31.2	915	χ^2 =0.010
	No	69.0	26.4	42	p = 0.920
Total		67.3	31.7	957	
		Inspection of vehicles/parts			
Awareness of injuries causing circumstances	Yes	84.7	15.3	928	χ^2 = 0.50
	No	86.2	13.8	29	p = 0.824
Total		84.7	15.3	957	
Awareness of suffering workplace injuries or illnesses	Yes	84.9	15.1	915	χ^2 =0.488
	No	81.0	19.0	42	p = 0.485
Total		84.7	15.3	957	

Source: Field Survey (2016)

Organisational factors and safety practices among auto-artisans

Organisational factors were hypothesised to moderate the effect of orientation on workplace safety artisans received on OHS practices. This is

because according to Seo (2005) and Cooper and Phillips (2004), there is a relationship between organisational factors and worker safety behaviour such as action taken to ensure safety at the workplace. It has also been suggested by Glendon, Clarke & McKenna (2006) that safety culture of an organisation influences workers' behaviour which can lead to injuries or accidents. Factors within the organisation considered were; safety as a priority in the workshop and the presence of well-established safety culture. Safety culture was adopted because Mearns et al. (2003:642) argued that safety culture is important because it forms the setting within which ones' safety attitudes develop and persist while Choudhry, Fang and Mohamed (2007) assert that safety culture influences employees' attitudes and behaviour towards an organisation's health and safety measures.

Table 20 shows that 72.7 percent of the respondents indicated that they prioritised safety at the workshop. However, through the on-site observation, it was realised that in about half of the workshops observed (as exhibited in Figure 8), electrical wires were strung across the floors and walkways without protection or cover. Some of the workshops also had slippery materials such as grease and oils on the floor (Figure 9) which had the potential to lead to slips and fall. Secondly, none of the workshops observed had fire extinguishers or first aid boxes, while only two out of the 29 shops observed had smoke detectors.

Figure 8: An oil soiled floor at a workshop left uncleaned
Source: Fieldwork (2016)

Figure 9: Electrical wires strung across walkways in a workshop
Source: Fieldwork (2016)

It emerged from Table 20 that respondents who said they prioritised safety (73.5%) and had well-established safety culture at their workshops (75.6%) use more PPE as compared to those who said workplace safety is not a priority (26.5%) and that they do not have a well-established safety culture at

their workshops 24.4%). This association was tested using Pearson's chi-square and the results showed statistically significant relationship between safety as a priority (χ^2 (1) N=957, 6.766 p= 0.009), as well as well-established safety culture (χ^2 (1) N=957, 7.436 p= 0.006) and use of PPE.

Table 20 again shows that respondents who prioritise safety in their workshop (69.1%) and had well-established safety culture (74.5%) take actions to ensure safety at their workshop. This association was found to be statistically significant (χ^2 (1) N=957, 36.48, p<0.001) and (χ^2 (1) N=957, 23.06, p < 0.001) respectively.

On the issue of artisans meeting and discussing workplace safety matters, it was observed that there was a statistically significant association between whether respondents meet and discuss safety issues and whether safety is a priority in their workshop (χ^2 (1) N=957, 34.46, p<0.001) and whether workshop has a well-established safety culture or not (χ^2 (1) N=957, 17.39, p<0.001). It was observed that 70.1 percent of the respondents who consider workplace safety as a priority said they meet with other colleague auto-artisans to discuss workplace safety while 72.9 percent of those with well-established workplace safety culture indicated meeting to discuss workplace safety as an OHS practice.

The relationship between organizational factors (safety as a priority at the workplace and whether the workplace has a well-established safety culture) and inspection of vehicles or vehicle parts to assess hazards before repairing them was examined. Table 20 shows that there was statistically significant association between safety as a priority in respondents' workshops and

inspection of vehicles or vehicle parts before repairing them (χ^2 (1) N=957, 4.13, p=0.042).

It was found that eight out of ten respondents (85.2%) who claimed safety is a priority at their workshop also said they inspect vehicles before working on them. Similarly, 89.0 percent of those whose workshops have well established safety culture indicated they inspect vehicles before working on them. This was tested with a chi-square test of independence and produced a statistically significant association of χ^2 (1) N=957, 26.41, $p < 0.001$.

Table 20: **Organisational factors and safety practices among auto-artisans**

Organisational factors		Yes	No	Total	Test/p-value
		Use of PPE			
Workshop safety as a priority	Yes	73.5	26.5	920	χ^2 =6.766
	No	54.1	45.9	37	p = 0.009
Total		72.7	27.3	957	
Well-established safety culture	Yes	75.6	24.4	630	χ^2 =7.436
	No	27.3	32.7	327	p= 0.006
Total		72.7	27.3	957	
		Action taken to ensure safety			
Workshop safety as a priority	Yes	69.1	30.9	920	χ^2 =36.48
	No	21.6	78.4	37	p = 0.000
Total		67.3	32.7	957	
Well-established safety culture	Yes	72.5	27.5	630	χ^2 =23.06
	No	57.2	42.8	327	p= 0.000
Total		67.3	32.7	957	
		Meet to discuss safety issues			
Workshop safety as a priority	Yes	70.1	29.9	920	χ^2 =34.46
	No	24.3	75.7	37	p = 0.000
Total		68.3	31.7	957	
Well-established safety culture	Yes	72.9	27.1	630	χ^2 =17.39
	No	59.6	40.4	327	p= 0.000
Total		68.3	31.7	957	
		Inspection of vehicles			
Workshop safety as a priority	Yes	85.2	14.8	920	χ^2 = 4.13
	No	73.0	27.0	37	p = 0.042
Total		84.7	15.3	957	
Well-established safety culture	Yes	89.0	11.0	630	χ^2 =26.41
	No	76.5	23.5	327	p= 0.000
Total		84.7	15.3	957	

Source: Field Survey (2016)

Discussion of findings

The study examined the OHS practices among artisans at Suame Magazine. It considered the relationship between personal characteristics of respondents and safety practices, awareness of workplace hazards and safety practices, perceived risky job and safety practices and finally, organisational factors and safety practices among respondents.

The study found that auto-artisans at Suame Magazine take deliberate action to ensure safety. However, the poor housekeeping practices observed was an indication of poor management of space which has the potential to lead to unsafe act which could in turn trigger accidents and injuries as espoused by the Domino theory (Heinrich, 1959). The spillage of oil and grease on floors found by this current study raise concerns because it can lead to falls which in turn would lead to injuries as suggested by Goetsch (2019) that more than 16 percent of all work-related injuries are caused by falls. This finding confirms the earlier findings by Apreko, Danku, Akple and Aboagye (2015) that most automotive garages in Ghana have untidy working floors full of oil spillages. This does not conform to the Occupational Safety and Health Branch (2000) recommendation that clean and tidy workplace is critical in safeguarding the health and safety of the workers.

It has also been established that action taken to ensure safety in the workshop is related to age and membership of association. Thus, those aged between 30 and 69 years and those who joined labour associations mostly take actions to ensure safety at the workshop. These findings further suggest that the older an artisan, the more likely he or she would take some form of action to ensure workplace safety. For example, respondents who were 30 years and

above mostly act to ensure workplace safety than those below 30 years. This finding might be because most of the respondents below 30 years are apprentices who lack experience in workplace safety while those above 30 years are mostly master artisans and employers and as a result take serious note of safety at the workshop. The finding is in line with the conceptual framework for the study which states that personal characteristics such as age has a positive relationship with safety practices among workers.

The finding that the majority of respondents meet to discuss workplace safety is a good practice; workers have a better knowledge of how their job affects their health and so being involved in discussions on workplace safety would lead to proper identification and management of workplace risks and hazards (EU-OSHA (2012). However, the observation that such meetings were organised by the labour associations (for example the Ghana National Association of Garages) and not members of the individual workshops raises some concerns. This is because some of the factors associated with workplace safety are trade specific but such meetings organised by the labour associations discuss broad and general issues on workplaces safety to all their members in a particular zone irrespective of the artisanal trade one is engaged in.

From the findings, it is observed that statistically significant relationship was established between the age of respondents (respondents who were more than 50 years tend to meet to discuss workplace safety more than those below 50 years). This might be so because according to Cherry et al., (2005) older people are more likely to suffer serious injuries and as a result the aged are more likely to discuss workplace injuries with fellow workers. It might also be because the older respondents think more about workplace safety

than the young ones since from the data it was observed that most of the older respondents were master artisans. That is, as an artisan grows in age and also gains experience by working for a long period, he or she becomes aware of the importance of discussing safety issues with fellow workers. This was again confirmed when a statistically significant association was established between occupational status and meeting to discuss workplace safety issues, where master artisans were found to meet to discuss workplace safety more than apprentice.

The finding that master artisans meet more to discuss safety issues than apprentices is likely because master artisans own the workshops and therefore take keen interest in the health and safety of their workers at the workshop. The finding of a statistically significant association between number of years of working experiences and meeting to discuss workplace safety (artisans with more than 20 years of experience meet to discuss workplace safety more that their other counterparts) was expected. This is because, as explained earlier, most of those who had worked for longer years are master artisans and own their workshops and therefore are interested in safety at the workshop.

On the other hand, it was unexpected that formal education was not found to influence meeting to discuss safety issues even though respondents with higher education were found to meet and discuss workplace safety more than those with low levels of education. This is likely because the number of respondents with secondary and tertiary education was low as posited by Adeya (2006) that auto-artisans at Suame Magazine has low level of education. This is also at variance with the conceptual framework for the study which hypothesised that formal education influences safety practices among workers.

It is however strange that meeting with colleague workers to discuss safety issues at the workplace does not depend on membership of labour association. This finding was not expected because it is thought that training programmes on health and safety are organised by or through the associations, and therefore respondents who belong to the associations would meet more often to discuss safety issues than those who do not belong to any association. It is concluded however that, apart from membership of association, level of education and income of respondents, the results generally indicate that meeting with colleagues to discuss workplace safety is associated with personal characteristics of the auto-artisan.

The finding of the study that respondents do not use the full complement of PPE raises concern. This can lead to injuries and illness which artisans do not imagine and hence do not attempt to prevent. The finding that use of PPE is associated with age (where respondents aged between 20 and 49 years were found to use more PPE) is important. This was because most of the respondents in this age bracket (20 and 49 years) are apprentices and therefore take instructions on the use of PPE from their masters or because of their inexperience, they are scared of injury and therefore respond to their fear and therefore use PPE as suggested by the PMT (Rogers, 1975). Again, it is likely because respondent aged above 40 years believed they were experienced, and as a result know what can expose them to injuries and therefore do not see the importance of using PPE.

The finding of statistically significant relationship between membership of association and use of PPE (where those who join labour unions use more PPEs than their counterparts who do not join any association)

is of concern. This can be associated to the fact that most often, training programmes on health and safety practices are organised by or through the workers' associations and as a result, artisans who are members of these associations are more likely to have learnt the importance and need to use PPE than non-members. This is established from the fact that as much as 69 percent of respondents who said they do not join any of the labour associations also said they do not use PPE (Table14). This is of much concern and calls for intensive education on the use of PPE for both artisans who belong to associations and those who do not. This finding reveals the importance of the associations to the safety practices of auto-artisans at Suame Magazine as posited by Adeya (2006).

There was no statistically significant relationship between formal education of respondents and the use of PPE. This finding is at variance with the conceptual framework. It was also unexpected because it is thought that formal education would influence all aspects of workplace safety practices including use of PPE. The study therefore failed to reject the hypothesis that "*there is no statistically significant relationship between formal education and use of PPE*". However, as demonstrated by the results presented in Table 14, there are slight differences between levels of education and use of PPE. This might be because of the low numbers of respondents with secondary and tertiary education at the enclave (Adeya, 2006). Even though, the association between number of years of experience and use of PPE was not statistically insignificant, the results still indicate that the use of PPE is slightly influenced by experience. The results showed that respondents who had worked for more than 30 years used less PPE than those with working experience of

less than 31 years. This suggests that the more working experience an auto-artisan acquires, the more complacent he or she becomes and therefore does not see the need to use PPE. This situation is however dangerous since occupational accidents do not consider the number of years one has worked; again, it serves as a demotivation for new auto-artisans especially apprentices in the use of PPE. This can place them in the self-illusion of perceived control over safety; that is, respondents with long working experience would believe they have knowledge about safety due to the many years of working and therefore can control their safety (Huang, Ho, Smith & Chen, 2006).

The non-use of PPE by auto-artisans who had many years of working experience is likely because respondents with longer years of working experience do not perceive their work as dangerous or risky and so do not see the need to use PPE. This finding deviates from that of Wanjiku (2017) who found that the higher the number of working experiences of an auto-artisans the higher the use of PPE while working.

The study also found that except experience (respondents with experiences between 1 and 20 years inspect vehicles more than those with working experience of more than 20 years) and membership of association (artisans who belong to a labour association inspect vehicle more as compared to those who are not members), personal characteristics of respondents were not statistically significantly related to inspection of vehicles and vehicle parts before working on them as a safety practice among artisans even though a sizable proportion of the respondents indicated they inspect vehicles before working on them. This finding suggests that inspection of vehicle is part of

activities routinely carried out by auto-artisans and not necessarily because of their personal characteristics.

The revelation that auto-artisans with long working experience did not inspect vehicles for hazards is likely because with their long working experience they have knowledge on hazards associated with vehicles and therefore do not need to carry out any inspection before identifying hazards. However, the discovery that inspection of vehicles to identify hazards before working on them is related to membership of labour association is an indication of the important roles the labour associations play in the daily activities of the artisans with respect to training on OHS. The findings suggest that socio-demographic characteristics of artisans at Suame Magazine do not necessarily influence their health and safety practices. This is in line with Kónya, Matić, and Pavlović (2016) conclusion that most socio-demographic characteristics of workers have little effect on safety practices. The revelation that safety practices among auto-artisans at Suame Magazine is not influenced by socio-demographic characteristics is positive for health and safety interventions at the enclave since any training programme designed to educate the artisans on workplace safety will have little concern with the socio-demographic characteristics of the auto-artisans.

The study found a statistically significant relationship between perceived risky job and use of PPE by respondents. This finding means that respondents who find their jobs risky more often use PPE than those who do not consider their jobs to be risky. This falls in line with the conceptual framework and the position of Friese et al. (2015) and the conceptual framework for the study that use of PPE is influenced by perceived risky job.

This current finding might be because those who consider their jobs risky try to prevent accidents and therefore use protective equipment to protect themselves. On the other hand, those who believe their workplace is safe do not see the need to protect themselves and so do not bother to use any protective equipment. This might be because of their belief that they are not at risk of any accident since they consider their workshop safe. This is not good for workplace safety because such artisans may lose guard and suffer workplace injuries.

The study has revealed that auto-artisans at Suame Magazine employ safety practices in their various workshops not because they find their work risky but may be as a routine activity or as a means of keeping the workshop safe and thereby preventing accidents. This finding might explain why there is no relationship between respondents who said their workplace is safe and their use of PPE. This means that most of the respondents take actions to ensure safety in their workshop, keep their workshop safe and so do not bother to use PPE. This finding means that, respondents meet with fellow artisans to discuss issues relating to workplace safety not because they find their work to be risky but it may be because that is what they learnt from "their masters".

The study fails to reject the hypothesis that "*there is no statistically significant relationship between awareness of occupational hazards and the use of PPE by auto artisans"*. This finding is surprising and contradicts the conceptual framework and the suggestion by Friese et al. (2015) that awareness of workplace hazards positively relates to safety practices such as use of PPE. The finding means that awareness of occupational hazards does not necessarily mediate between orientation on workplace safety received by

artisans and their use of PPE. However, this current finding indicating that there is no relationship between awareness of workplace hazards and use of PPE is in line with that of Ahmad (2017) who found an appreciable level of awareness of workplace hazards among sandstone mine workers in Rajasthan, India, but discovered that the level of awareness did not reflect the use of PPE by the workers.

The finding of a statistically significant relationship between awareness of circumstances which could lead to workplace injuries and illnesses and action taken to ensure safety at the workplace is relevant because it demonstrates that respondents move above mere awareness of what leads to workplace injuries and illnesses and act in ways to prevent injuries and illnesses. This again means that when artisans become aware of what leads to injuries and diseases, they will find means, and also act to ensure their safety.

The findings as presented in Tables 19 is at variance with Friese et al. (2015) who hypothesised that awareness and knowledge of OHS hazards mediates between health and safety orientation and safety practices such as use of PPE. The current findings do not support earlier studies which have shown that artisans who are aware of occupational hazards are more likely to employ safety practices in their work than those who are unaware of occupational hazards (Marahatta et al., 2018; Budhathoki et al., 2014). It however confirms that of Diwe et al. (2016) that awareness of hazards is not related to use of PPE.

The study also hypothesised that there is no statistically significant relationship between organisational factors and safety practices among auto-artisans at Suame Magazine. This hypothesis was tested with the Pearson's

chi-square of independence. The following safety practices were found statistically significant; safety as a priority, well-established safety culture, and use of PPE; safety as a priority, well-established safety culture and action taken to ensure workplace safety. The rest were, safety as a priority, well-established safety culture and meeting to discuss workplace safety; safety as a priority, well-established safety culture and inspection of vehicles to assess hazards before working on them. This suggests that the null hypothesis stating that "there is no statistically significant relationship between organisational factors and safety practices among auto-artisans" carried.

This finding means that respondents who prioritise safety at their workshop and had established safety culture meet more to discuss issues relating to workplace safety as compared to those who said safety is not a priority at their workshops as well as those who do not have well established safety culture in their workshops. This finding buttresses the point by Toppazzini and Wiener (2017) that workplace safety culture positively corelates with safety behaviour. This also means that respondents who inspect vehicles before repairing them prioritised safety in their workshop. They also had an established safety culture in the workshop. This is in line with the position of Glendon et al. (2006) that safety culture influences workers' behaviour towards safety, injuries or accidents; and the prediction that appropriate safety climate leads to reduced occupational injuries among workers (Barling, Zacharatos & Iverson, 2005; Barling, Loughlin, & Kelloway, 2002). It again supports the prediction by conceptual framework and Friese et al. (2015) and the human factor theory of accident causation (Reason, 2016) that factors within an organisation relate to safety practices and

accidents causation due to their moderating effects. The findings of the present study further support that of previous studies in the literature with reference to the importance of safety climate and personal characteristics in applying safety behaviours and practices (Toppazzini, & Wiener, 2017: Richardson & Abraham, 2009).

Summary

Workplaces safety practices among respondents was found to be high as the majority of them indicated they take deliberate action such as cleaning of unavoidable spill of oil and proper arrangement of working tools to prevent accidents and injuries. The majority of respondents said they wear PPE when at work. However, auto-artisans do not wear the full complement of PPE but choose and were what they considered important for the work they are engaged in at a particular time. Organisational factors and safety culture were found to determine use of PPE among auto-artisans at Suame Magazine.

CHAPTER EIGHT

WILLINGNESS-TO-PAY FOR OCCUPATIONAL HEALTH AND SAFETY SERVICES

Introduction

This chapter discusses the willingness of artisans to pay for OHS services. It looks at the association between socio-demographic characteristics of respondents and their WTP for OHS services such as reading materials on workplace safety, training on OHS and the services of a medical doctor. The chapter also discusses the association between respondents' awareness of workplace hazards, their perception of risky job and WTP for OHS services, as well as the association between organisational factors and WTP for OHS services.

WTP for OHS services

The study examined the willingness of auto-artisans to pay for OHS services as well as the association between respondents' socio-demographic characteristics and their WTP for OHS services. This was important because in the view of Babatunde et al. (2012), willingness of artisans to pay for OHS services is influenced by their personal characteristics. Secondly, understanding socio-economic factors which influence artisans' WTP for OHS services allows for segmenting them for intervention programmes.

A bivariate analysis (chi-square test) of the association between background characteristics of respondents and WTP for OHS services

Table 21: Bivariate analysis of socio-demographic characteristics and WTP for OHS services

Background characteristic	Willingness-to-pay		χ^2	*P*-value
	No	Yes		
Age in years			5.83	0.442
Less than 20	26.92	73.08		
20 – 29	23.68	76.32		
30 – 39	20.14	79.86		
40 – 49	28.24	71.76		
50 – 59	26.67	73.33		
60 – 69	14.29	85.71		
70 and above	33.33	66.67		
Marital status			9.22	0.100
Never married	27.23	72.77		
Married	21.26	78.74		
Cohabiting	16.33	83.67		
Separated	0.00	100.00		
Divorced	0.00	100.00		
Widowed	0.00	100.00		
Level of education			23.75	0.000
No formal	46.88	53.13		
Primary	28.97	71.03		
JHS/Middle	21.01	78.99		
SHS/Sec/Tech	21.23	78.77		
Tertiary	28.57	71.43		
Occupational status			0.54	0.760
Master artisan	23.93	76.07		
Work and pay artisan	17.86	82.14		
Apprentice	23.87	76.13		
Number of years of artisanship			5.34	0.375
1 – 10	24.79	75.21		
11 – 20	20.77	79.23		
21 – 30	23.88	76.12		
31 – 40	26.79	73.21		
41 – 50	28.57	71.43		
51 – 60	100.00	0.00		
Type of trade			1.88	0.389
Autobody works	21.61	78.39		
Mechanic (fitting)	23.33	76.67		
Ancillary services	27.01	72.99		
Weekly income (Ghs)			6.43	0.169
0 – 99	20.55	79.45		
100 – 199	22.12	77.88		
200 – 299	31.41	68.59		
300 – 399	23.36	76.64		
400 and above	22.58	77.42		

Source: Fieldwork (2016)

presented in Table 21 only showed statistical significance for level of education. The rest of the background characteristics showed no statistically significant association with WTP for OHS services.

With regards to the logistic regression analysis, it was found in Model 1, that orientation on OHS had no statistically significant association with WTP for OHS services (Table 22).

In Model 2, even though age was not statistically significant at the bivariate level, it showed weak association with WTP for OHS services at the multivariate level. Compared to respondents aged less than 20 years, auto-artisans within the age category 40-49 years were more likely to be willing to pay for OHS services (OR=0.40, [0.88-2.25]). With regards to marital status, respondents who were married were more willing to pay for OHS services as compared to those who were never married (OR=1.98, [1.24-3.18]).

Education was found to be a strong predictor for respondents' WTP for OHS services. Compared to respondents without formal education, those with primary education were twice more likely to be willing to pay for OHS services. Moreover, respondents with junior secondary or middle school education were more willing to pay for OHS services (OR=3.21, [1.83-5.60]). Similarly, respondents with secondary/technical/vocational education were more willing to pay for OHS services (OR=3.38, [1.74-6.57]).

Table 22: Logistic regression analysis of WTP for OHS services

Variable	Model 1	Model 2
	OR [95% CI]	OR [95% CI]
Orientation		
No	Ref	Ref
Yes	0.76 [0.52-1.12]	0.76 [0.51-1.13]
Age in years		
Less than 20		Ref
20 – 29		1.07 [0.60-1.92]
30 – 39		0.87 [0.43-1.74]
40 – 49		0.40* [0.16-0.95]
50 – 59		0.49 [0.16-1.52]
60 – 69		4.71 [0.40-55.13]
Marital status		
Never married		Ref
Married		1.98** [1.24-3.18]
Cohabiting		1.70 [0.76-3.82]
Level of education		
No formal		Ref
Primary		2.08* [1.06-4.09]
JHS/Middle		3.21*** [1.83-5.60]
SHS/Voc/Tech		3.38*** [1.74-6.57]
Tertiary		1.90 [0.32-11.10]
Occupational status		
Master artisan		Ref
Work and pay artisan		1.32 [0.45-3.85]
Apprentice		1.08 [0.68-1.71]
Number of years of artisanship		
1 – 10		Ref
11 – 20		1.40 [0.88-2.25]
21 – 30		1.33 [0.69-2.55]
31 – 40		1.03 [0.40-2.67]
41 – 50		0.16 [0.015-1.67]
51 – 60		.
Type of trade		
Autobody works		Ref
Mechanic (fitting)		0.96 [0.65-1.41]
Ancillary services		0.81 [0.51-1.27]
Weekly income (Ghs)		
0 – 99		Ref
100 – 199		0.89 [0.52-1.53]
200 – 299		0.61 [0.35-1.06]
300 – 399		0.92 [0.51-1.65]
400 and above		0.94 [0.57-1.55]
N	957	944

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: Fieldwork (2016)

In Table 23, a chi-squire test of independence shows that 74.9 percent of the sampled auto-artisans indicated that they were willing to pay for reading materials on OHS. In all, 76.3 percent said they were willing to pay for training on workplace safety (see Table 24) while 73 percent indicated their WTP for the services of a medical doctor to examine them for occupational health challenges (see Table 25). Table 23 demonstrates that there was a statistically significant association between formal education ($F=49.93$, $p<0.001$) and WTP for reading materials on workplace safety. It was observed that, the higher the formal educational attained by a respondent, the more willing he or she was to pay for reading materials on workplace safety. Respondents who had secondary and tertiary education were more willing to pay for reading materials on workplace safety. For example, while 82.9 percent of respondents with secondary school education indicated their WTP for reading materials on workplace safety, all respondents (100%) with tertiary education said so, compared to 78.4 percent of respondents with Junior High School certificate who were WTP for reading materials.

Table 23: Socio-demographic characteristics and WTP for reading materials on workplace safety

Socio-demographic characteristics	WTP for reading materials				
	N	Yes	No	χ^2 statistic	P- value
Age in years					
Less than 20	78	67.9	32.1	F= 7.90	0.227
20 – 29	342	77.8	22.2		
30 – 39	283	72.1	27.9		
40 – 49	170	74.7	25.3		
50 – 59	60	76.7	23.3		
60 – 69	21	90.5	9.5		
70 and above	3	66.7	33.3		
Educational level					
No formal education	64	43.8	56.2	F= 49.93	0.000
Primary	107	60.7	39.3		
JHS/Middle school	633	78.4	21.6		
Secondary/Technical	146	82.9	17.1		
Tertiary	7	100	0.0		
Marital status					
Never married	470	72.6	27.4	F= 3.42	0.640
Married	428	77.1	22.9		
Co-habitation	49	75.5	24.5		
Separated	7	85.7	14.3		
Divorced	2	100	0.0		
Widowed	1	100	0.0		
Occupational status					
Master artisan	443	75.4	24.6	χ^2 = 1.02	0.602
Work and pay artisan	28	82.1	17.9		
Apprentice	486	74.1	25.9		
No. of years spent as an artisan					
1-10	468	73.9	26.1	F=4.89	0.427
11-20	284	74.3	25.7		
21-30	134	79.9	20.1		
31-40	56	76.8	23.2		
41-50	14	71.4	28.6		
51 – 60	1	0.0	100		
Average income (Ghs)					
0-99	146	76.7	23.3	χ^2 = 9.16	0.057
100-199	208	76.9	23.1		
200-299	156	66.0	34.0		
300-399	137	73.0	27.0		
400 and above	310	78.1	21.9		
Membership of association					
Yes	438	81.3	18.7	χ^2 =	0.000
No	519	69.6	30.4	17.37	
Total	957	717	240		
	(100)	(74.9)	(25.1)		

Source: Field Survey (2016

With a chi-square test of independence result of χ^2 (1) N=957, 17.37, p=0.001, it was also found that respondents who joined associations were more willing to pay for reading materials on workplace safety as compared to those who did not join any labour associations. It was however found that there was no statistically significant association between age (F (6) N=957, 7.90, p=0.227), occupational status (χ^2 (2) N=957, 1.02, p=0.602), number of years as an artisan (F (5) N=957,4.89, p=0.427), income (χ^2 (4) N=957, 9.16, p=0.057) and WTP for reading materials on OHS (Table 23).

As shown in Table 24, there was statistically significant association between educational level and WTP for training on workplace safety (F (4) N=957, 21.58, p<0.001). Regarding education, the higher the educational level of a respondent, the more he or she is willing to pay for training on workplace safety. More respondents who had tertiary (71.4%), secondary (78.8%) and Junior High School (79.0%) education were willing to pay for training on workplace safety as compared to respondents without any form of formal education and primary education.

Similarly, a statistically significant association was established between membership of association and WTP for training on workplace safety (χ^2 (1) N=957, 12.19, p<0.001). It was found that respondents who belong to an association (81.5%) were more willing to pay for training on workplace safety as compared to respondents who are not members of any association (71.7%). However, there was no statistically significant association between the other socio-demographic characteristics and respondents' WTP for training on workplace safety (see Table 24).

Table 24: Socio-demographic characteristics and WTP for training on workplace safety

Socio-demographic characteristics	WTP for training				
	N	Yes	No	Test statistic	*P*- value
Age in years					
Less than 20	78	73.1	26.9	F = 5.84	0.442
20 – 29	342	76.3	23.7		
30 – 39	283	79.9	20.1		
40 – 49	170	71.8	28.2		
50 – 59	60	73.3	26.7		
60 – 69	21	85.7	14.3		
70 and above	3	66.7	33.3		
Educational level					
No formal education	64	53.1	46.9	F=21.58	0.000
Primary	107	71.0	29.0		
JHS/Middle school	633	79.0	21.0		
Secondary/Technical	146	78.8	21.2		
Tertiary	7	71.4	28.6		
Marital status					
Never married	470	72.7	27.3	F=9.23	0.100
Married	428	78.7	21.3		
Co-habitation	49	83.7	16.3		
Separated	7	100	0.0		
Divorced	2	100	0.0		
Widowed	1	100	0.0		
Occupational status					
Master artisan	443	76.1	23.9	F= 0.42	0.848
Work and pay artisan	28	82.1	17.9		
Apprentice	486	76.1	23.9		
No. of years spent as an Artisan					
1-10	468	75.2	24.8	F=5.11	0.401
11-20	284	79.2	20.8		
21-30	134	76.1	23.9		
31-40	56	73.2	26.8		
41-50	14	71.4	28.6		
51 – 60	1	0.0	100		
Weekly income (Ghs)					
0-99	146	79.5	20.5	$\chi^2 = 6.44$	0.169
100-199	208	77.9	22.1		
200-299	156	68.6	31.4		
300-399	137	76.6	23.4		
400 and above	310	77.4	22.6		
Membership of association					
Yes	438	81.5	18.5	$\chi^2 = 12.19$	0.000
No	519	71.9	28.1		
Total	957	730	227		
	(100)	(76.3)	(23.7)		

Source: Field Survey (2016)

With reference to socio-demographic characteristics of respondents and their WTP for medical examination, Table 25 reveals that most of the respondents (73.0%) were willing to pay for the services of a medical doctor for medical examination. Statistically significant associations were found between age (F (6) N=957,19.47, p=0.003), marital status (χ^2 (5) N=957, 18.97, p=0.001), membership of association (χ^2 (1) N=957, 11.39, p=0.001) and WTP for the services of a medical doctor. On age, it was established that the older the respondents, the more willing they are to pay for medical examination as compared to the younger ones. A statistically significant association was established between occupational status of respondents and WTP for the services of a medical doctor (F (2) N=957,14.34, p=0.001). Master artisans (86.0%) and work-and-pay artisans (96.4%) were found to be more willing to pay for the services of a medical doctor that apprentices.

Respondents who join associations (78.3%) were more willing to pay for medical examination than those who dd not belong to any association (68.6%). With a Fisher Exact test result (F (5) N=957, 18.97, p=0.001, a statistically significant relationship was found between marital status and WTP for medical examination. Respondents who were in a form of relationship (married-87.1% and co-habitation-87.8%) indicated more WTP for medical examination than those who were never married (77.4%). There was however, no statistically significant association between level of education (F (4) N=957,0.34, p=0.986), number of years in artisanship (F (5) N=957, 9.06, p=0.095), incomes (χ^2 (4) N=957, 3.82, p=0.431) and their WTP for services of a medical doctor on workplace safety.

Table 25: Socio-demographic characteristics and WTP for the services of a medical doctor

Socio-demographic characteristics	WTP for a medical doctor				
	N	Yes	No	χ^2 statistic	*P*- value
Age					
Less than 20	78	67.9	32.1	F = 19.47	0.003
20 – 29	342	79.5	20.5		
30 – 39	283	84.5	15.5		
40 – 49	170	85.3	14.7		
50 – 59	60	91.7	8.3		
60 – 69	21	95.2	4.8		
70 and above	3	100	0.0		
Educational level					
No formal education	64	84.4	15.6	F=0.34	0.986
Primary	107	81.3	18.7		
JHS/Middle school	633	82.0	18.0		
Secondary/Technical	146	82.9	17.1		
Tertiary	7	85.7	14.3		
Marital status					
Never married	470	77.4	22.6	F= 18.97	0.001
Married	428	87.1	12.9		
Co-habitation	49	87.8	12.2		
Separated	7	57.1	42.9		
Divorced	2	100	0.0		
Widowed	1	100	0.0		
Occupational status					
Master artisan	443	86.0	14.0	F=14.34	0.001
Work and pay artisan	28	96.4	3.6		
Apprentice	486	78.0	22.0		
No. of years spent as an artisan					
1-10	468	78.6	21.4	F=9.06	0.095
11-20	284	84.5	15.5		
21-30	134	85.8	14.2		
31-40	56	89.3	10.7		
41-50	14	92.9	7.1		
51 – 60	1	100	0.0		
Average weekly income					
0-99	146	82.9	17.1	χ^2 =3.82	0.431
100-199	208	81.7	18.3		
200-299	156	78.2	21.8		
300-399	137	86.9	13.1		
400 and above	310	82.3	17.7		
Membership of association					
Yes	438	78.3	21.7	χ^2 =11.39	0.001
No	519	68.6	31.4		
Total	957 (100%)	699 (73.0%)	258 (27%)		

Source: Field Survey (2016)

Table 26 shows reasons respondents assigned for their lack of WTP for OHS services. Respondents who said they were not willing to pay for reading materials on OHS services assigned reasons such as; don't have money to pay (40%), in ability to read (32.1%). Those who said they were not willing to pay for training on workplace safety also said they do not have money to pay (38.3%), the training is a waste of time (28.2%). Similarly, 40.7 percent of those who did not exhibit WTP the services of a medical officer said they had health insurance.

Table 26: **Reasons for respondents' unwillingness to pay for OHS services**

Not willing to pay for:	Freq.	Percent
Reading materials		
I do not have money	96	40.0
I cannot read and write	77	32.1
I do not have time to read	46	19.2
I am not interested in reading materials	21	8.7
Total	240	100
Training on workplace safety		
I do not have money to pay	87	38.3
It is a waste of time	64	28.2
The training will not benefit me	49	21.6
I cannot stop work and attend	27	11.9
Total	227	100
The services of a medical doctor		
I have health insurance	105	40.7
I do not have money to pay	78	30.2
I do not often fall sick	64	24.8
I have my personal doctor	11	4.3
Total	258	100

Source: Fieldwork (2016)

Perceived risky job and WTP for OHS services

Not yet properly addressed in the literature and by the various previous studies at Suame Magazine is whether perceptions of risk associated with

artisanship translates into WTP for OHS services. As a result, and based on the conceptual framework adapted for the study, perceived risky job was used to assess the willingness of auto-artisans to pay for OHS services (see Table 27). Table 27 shows that there was also no statistically significant association between respondents who found their work risky (χ^2 (1) N=957, 1.29, p=0.257) and their WTP for medical examination.

Similarly, the association between respondents who said their workplace was safe (χ^2 (1) N=957, 3.69, p=0.054) and their WTP for medical examination was not statistically significant (see Table 27).

Table 27: Perception of risky job and WTP for OHS services

Perception of risky job		Yes	No	Total	Test/p-value
	WTP for reading materials				
Perceive work to be risky	Yes	74.8	25.2	916	χ^2 = 0.22
	No	78.0	22.0	41	p = 0.637
Total		74.9	25.1	957	
Safe workplace	Yes	75.5	24.5	846	χ^2 =1.47
	No	70.3	29.7	111	p = 0.229
Total		74.9	25.1	957	
	WTP for training				
Perceive work to be risky	Yes	76.4	23.6	916	χ^2 = 0.23
	No	73.2	26.8	41	p = 0.632
Total		76.3	23.7	957	
Safe workplace	Yes	80.9	19.1	846	χ^2 =0.40
	No	73.9	26.1	111	p = 0.526
Total		76.3	23.7	957	
	WTP for a medical				
Perceive work to be risky	Yes	82.5	17.5	916	χ^2 = 1.29
	No	75.6	24.4	41	p = 0.257
Total		82.2	17.8	957	
Safe workplace	Yes	83.1	16.9	846	χ^2 = 0.3.69
	No	75.7	24.3	111	p = 0.054
Total		82.2	17.8	957	

Source: Field Survey (2016)

Awareness of workplace hazards and WTP for OHS services

The study also examined the awareness of workplace hazards and willingness of artisans to pay for OHS services. The attributes used to represent awareness of workplace hazards were, respondents' awareness of circumstances which expose them to workplace injuries and awareness of the possibility of suffering workplace injuries and illnesses. The results are presents in Table 28. The study found that there was no statistically significant association between respondents' awareness of circumstances which potentially exposed them to occupational injuries and their WTP for reading materials on workplace safety (χ^2 (1) N=957, 1.40, p=0.235). Similarly, there was no statistically significant association between awareness of the possibility of falling sick or getting injured from the workplace and their WTP for reading materials on workplace safety (χ^2 (1) N=957, 0.038, p=0.846).

Table 28: Awareness of workplace hazards and WTP for OHS services

Awareness of hazards		Yes	No	Total	Test/p-value
	WTP for reading materials				
Awareness of injury causing circumstances	Yes	75.2	24.8	928	χ^2 =1.41
	No	65.5	34.5	29	p = 0.235
Total		74.9	25.1	957	
Awareness of suffering workplace injuries and illnesses	Yes	74.9	25.1	915	χ^2 =0.038
	No	76.2	23.825.	42	p = 0.846
Total		74.9	1	957	
	WTP for training				
Awareness of injury causing circumstances	Yes	76.5	23.5	928	χ^2 = 0.88
	No	69.0	31.0	29	p = 0.347
Total		76.3	23.7	957	
Awareness of suffering workplace injuries and illnesses Total	Yes	76.5	2305	915	χ^2 =0.571
	No	71.4	28.6	42	p = 0.450
		76.3	23.7	957	
	WTP for a medical				
Awareness of injury causing circumstances	Yes	82.2	17.8	928	χ^2=0.01
	No	82.8	17.2	29	p = 0.94
Total		82.2	17.8	957	
Awareness of suffering workplace injuries and illnesses	Yes	82.0	18.0	915	χ^2 =1.03
	No	88.1	11.9	42	p = 0.310
Total		82.2	17.8	957	

Source: Field Survey (2016)

Organisational factors and WTP for OHS services

The study examined the relationship between organizational factors and willingness of respondents to pay for OHS services. Table 29 demonstrates that there was a statistically significant relationship between respondents who said their workplaces have well-established safety culture and their WTP for reading materials on workplace safety (χ^2 (1) N=957, 19.38, p=0.000). Those who said their workshops had well-established culture (80.6%) indicated they were willing to pay for reading material on OHS while only 51 percent of those whose workshops did not have well-established safety culture indicated WTP for reading materials on OHS.

Similarly, there was a statistically significant relationship (χ^2 (1) N=957, 34.08, p=0.000) between respondents who said their workplaces had well-established health and safety culture and their WTP for training on workplace safety. For example, 82.1 percent of the respondents who said their workplace was safe indicated their WTP for training on OHS while 65.1 percent of those who did not find their workplace safe said they were willing to pay for training on OHS services.

On the other hand, there was no statistically significant relationship between respondents whose priority was safety at their workplaces and their WTP for reading materials on workplace safety (χ^2 (1) N=957, 2.07, p=0.150). Again, no statistically significant relationship was found (χ^2 (1) N=957, 0.01, p=0.930) between respondents whose priority was the safety of workers at workplace and their WTP for training on workplace safety. There was also no statistically significant relationship between respondents who said safety was a priority at their workplaces (χ^2 (1) N=957, 2.26, p=0.133).

Table 29: Organisational factors and WTP for OHS services

Organisational factors		Yes	No	Total	Test/p-value
	WTP for reading materials				
Workshop safety as a priority	Yes	75.3	24.7	920	χ^2 =2.07
	No	64.9	35.1	37	p = 0.150
Total		74.9	25.1	957	
Well-established safety culture	Yes	79.4	20.6	630	χ^2 =19.38
	No	66.4	33.6	327	p= 0.000
Total		74.9	25.1	957	
	WTP for training				
Workshop safety as a priority	Yes	76.3	23.7	920	χ^2 =0.01
	No	75.7	24.3	37	p = 0.930
Total		76.3	23.7	957	
Well-established safety culture	Yes	82.1	17.9	630	χ^2 =34.08
	No	65.1	34.9	327	p= 0.000
Total		76.3	23.7	957	
	WTP for a medical				
Workshop safety as a priority	Yes	82.6	17.4	920	χ^2 =2.26
	No	73.0	27.0	37	p = 0.133
Total		82.2	17.8	957	
Well-established safety culture	Yes	83.1	16.9	630	χ^2 =1.11
	No	80.4	19.6	327	p= 0.292
Total		82.2	17.8	957	

Source: Field Survey (2016)

Discussion of findings

This chapter presents the willingness of the artisans to pay for OHS services, and examined the relationship between the perception of risky job and WTP for OHS services. Generally, the WTP for OHS services was high (reading materials-74.9%, training on workplace safety-76.3% and the services of a medical doctor-82.2%) especially among older respondents. The high level of WTP for OHS services among respondents could facilitate and improve the management of OHS among auto-artisans (Li, Chen, Huang & Long, 2018).

The finding that older respondents were willing to pay for OHS services was expected since work-related illnesses starts showing at latter

stages as one grows older or spends more years at the workplace (National Research Council and the Institute of Medicine, 2004; Makateb & Torabifard, 2017). Again, Smith and Berecki-Gisolf (2014) have asserted that old age is associated with an increased risk of musculoskeletal illnesses among workers and hence older workers would be willing to pay for OHS services. The finding of the current study indicating that education is a strong predictor of WTP for OHS services is likely because respondents with higher formal education know the importance of OHS services on workplace safety and are therefore willing to pay for such services. This finding is in line with the position of Wu et al. (2012) that peoples' WTP is associated with higher education.

It emerged from the results that WTP for reading materials on OHS is related to education. This finding was expected since WTP for reading materials is most likely influenced by the ability to read and since respondents with higher education can read better than those with lower education it is reasonable that WTP for reading materials was associated with education. This contradicts the assertion by Harun et al. (2015) that education is not positively related to WTP, but it however confirms the position of Wu, Xu, Zhu, & Wang (2012) who have attributed WTP to higher education. It must be noted that the finding of no statistically significant association between age, marital status, occupational status, number of years in artisanship and the income of the respondents and WTP for reading materials is possibly because these characteristics do no relate to ability to read and hence people will naturally not pay for materials they cannot read.

The finding that WTP for training on OHS is associated with education can also be associated to the fact that respondents with higher formal education know the importance of training on workplace safety therefore their WTP for such training programmes. This is in line with the argument by Wu et al. (2012) that peoples' WTP is associated with higher education. However, it was expected that WTP for training on OHS would have been influenced by income since one's income has the potential to determine his or her ability to pay and hence WTP for training on OHS. Respondents' WTP for training on workplace safety is likely due to their quest to ensure their safety and not their income level. This finding confirms those of Krystallis and Chryssohoidis (2005) and Liebe, Preisendörfer and Meyerhoff, (2010) that peoples' WTP is not influenced by income. It however, contradicts the position of Angulo, Gil and Tamburo (2003) that WTP is a function of income.

From the results, it was observed that there was a statistically significant association between age of respondents and their WTP for a medical doctor to examine them. This is most likely because the aged are master artisans who can afford the cost of the services. It must also be because respondents who are above 50 years suffer from other illnesses which are not necessarily related to their occupation and so their WTP is not mainly due to OHS challenges they face. This current finding is in line with Harun et al. (2015) finding which posits that WTP is influenced by age.

The finding of statistically significant association between marital status and the willingness of respondents to pay for the services of a medical doctor may be due to the "influence of significant others". The spouses of respondents are likely to be the source of motivation to pay for the services of

a medical doctor. Secondly, it can also be because most of those who are married are master artisans who earn more income as compared to apprentice and as a result can afford to pay for the services. This is in line with the finding of the current study that master artisans are more willing to pay for the services of a medical doctor than apprentices (Table 22).

As indicated earlier, master artisans were willing to pay for the services of a medical doctor because they could afford to pay as well as due to their age (most of the master artisans were found to be old). The finding of no statistically significant relationship between income and WTP for reading materials, training on workplace safety and the services of a medical doctor is surprising, one might have thought that the income of artisans will influence their WTP for the services of a medical doctor. This is likely because respondents were members of the National Health Insurance Scheme and therefore did not see the need to pay extra for medical services. This finding contradicts that of Bamidele and Adebimpe (2012) who found a statistically significant relationship between income of artisans in Osun State, Nigeria, and their WTP for health insurance. It also does not support the findings of Babatunde et al. (2012) that WTP for OHS services is influenced by personal characteristics of individuals. The finding that income of respondents did not influence their WTP for OHS services is at variance with that of Wang, Jin, He, Gong & Tian (2018) indicating that WTP is influenced by income and education.

It emerged from the results that the decision to pay for medical examination has no association with the risky nature of respondents' work and their perception of workplace safety. This indicates that willingness of auto-

artisans to pay for the services of a medical doctor is not influenced by perception of risky job. This means that they are willing to pay a medical doctor to examine them because of their desire to ensure their safety and well-being and not because their workplace is safety or because their work is risky. The finding is at variance with that of Tanellari, Bosch, Boyle, and Mykerezi (2015) and Wang et al. (2018) which suggest that perception of risk and safety positively influences people's WTP. Other factors such as age, membership of association, occupational status, and marital status may play major roles in the willingness of artisans to pay for OHS services.

The findings that awareness of workplace hazards did not influence respondents' WTP for OHS services is surprising. This is likely due to the cost of the services (Alimi & Workneh, 2016) or because respondents have already subscribed to the national health insurance scheme existing in Ghana and so they see no need to further pay for OHS services. This finding contradicts findings in the literature which suggest that WTP for health and safety services is influenced by awareness (Adedeji, Doyin, Kayode & Ayodele, 2017; Tanellari et al. 2015; Bamidele & Adebimpe, 2012).

The finding of the current study indicating that WTP for training on workplace safety is not related to perceived risky job but to established safety culture at the workplace means that respondents' pay to attend training on workplace safety because they want to sustain the safety culture existing at the workshop. It is also possible that the willingness of auto-artisans to pay for training on OHS is because of the benefit they would derive from the training and not because they perceive their job to be risky. The present finding that there is no significant association between willingness of auto-artisans to pay

for OHS services and perception of risky job contradicts that of Yun, Lee and Kang (2016) who suggests that risk perception can affect WTP for services.

Summary

This chapter examined the WTO for OHS services among auto-artisans at Suame Magazine. The majority of respondents indicated their WTO for OHS services such as the supply of reading materials and training on workplace safety. Respondents who said they were not willing to pay for OHS services assigned reasons such as lack of money, inability to read, possession of health insurance for their lack of WTP for the service.

CHAPTER NINE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

The study set out to investigate OHS among auto-artisans in the informal economy in Suame Magazine in Kumasi. Its principal objective was to assess the OHS practices among the auto-artisans. Specifically, the study examined the relationship between orientation on workplace safety artisans received and their awareness of workplace hazards and their perception of the risky nature of their job. Also, it sought to find out how the awareness of workplace hazards and the perceived risk of job affect the safety practices of respondents. The study again examined the relationship between the personal characteristics of respondents, organisational factors existing in the various workshops and their OHS practices as well as their WTP for OHS services. The study was guided by the DEFENS Study Conceptual Framework developed by Friese et al. (2015) and driven by the Protection motivation theory (Rogers, 1975). The PMT explains factors and processes involved in individuals' decisions to engage in protective behaviours against potential threats (Rainear & Christensen, 2017; Bai et al., 2018). It suggests that attitudinal change is also a function of the amount of protection motivation aroused by the cognitive appraisal process.

The DEFENS Study Conceptual framework hypothesised the relationship between educational intervention, (which in this current study was orientation auto-artisans received) and awareness of occupational hazard and perception of risk associated with one's work. It also hypothesised that

awareness of workplace hazards and perception of risky job influences safety practices such as use of PPE, inspection of working tools and acting to ensure safety at the workplace.

The study employed the cross-sectional research design which describes and interprets what exist (Creswell, 2009). The research philosophy adopted was the positivist paradigm based on quantitative methods. Primary data, generated through a multi-stage sampling technique was used for the study. The target population was auto-artisans (both master craftsmen and apprentices) in Kumasi. A sample size of 957 respondents were employed for the analysis and discussion of the study.

Earlier chapters of this thesis have discussed findings in line with the objectives of the study. This chapter highlights the key findings, conclusions, contribution to knowledge, recommendations, limitations of the study and suggested areas for further research.

Summary of main findings

The following are some of the key findings of the study.

The profile of auto-artisanal trades at Suame Magazine

In all, 29 different auto artisanal trades were identified at the enclave. These are grouped in three main categories, namely, auto-mechanics, auto-body works and ancillary services. The results also reveal that auto-artisanship at Suame Magazine was dominated by males with only three females out of the 957 respondents. Three occupational statuses were identified among the artisans. These are master craftsmen, work-and-pay artisans and apprentices.

The ages of the respondents ranged from 15 years and 73 years. The level of education was found to be low among the auto-artisans, with only seven respondents who had completed tertiary education at the time of the study. Membership of association among respondents was found to be low as less than half of the respondents indicated they were members of the various labour associations at the enclave.

Health and safety-related orientation

The provision of orientation on OHS for new artisans especially apprentices was found to be high. The orientation on workplace safety is organised for new entrants by the master artisans themselves instead of state agencies or the labour unions at the enclave such as the Ghana National Association of Garages. The findings of the study indicate that the respondents who had received orientation on OHS were more aware of circumstances which led to workplace injuries and illnesses than those who did not receive any orientation. Regarding the relationship between orientation on workplace safety received and perception of risky job by auto-artisans, the study found a statistically significant relationship between respondents who received OHS orientation and their perception of safe workplace. Thus, confirming the DEFENS Study conceptual framework employed by the study which predicts a relationship between OHS orientation as a form of educational intervention and awareness of workplace hazards.

Occupational health and safety practices among artisans

The study revealed that OHS practices are followed by many of the auto-artisans at Suame Magazine. It was observed that most of them wore PPE, and were seen inspecting vehicles to assess hazards before working on them. However, most of the workshops were not properly kept leading to poor house-keeping. For example, in most workshops, vehicle parts were scattered all over making movement difficult, while the absence of cabinets for packing of working tools and vehicle parts was also observed. It was found that socio-demographic characteristics of auto-artisans did not necessarily influence their health and safety practices. While some of the personal characteristics of respondents were found to be related with their safety practices, others did not. For example, as meeting to discuss safety issues was found to be influenced by age of respondents, their marital status, occupational status and number of years of experiences, it was not associated with level of education and membership of association. Similarly, the study found that apart from age and membership of association, there was no statistically significant relationship between personal characteristics of respondents and the use of PPE.

The study again found that apart from the number of years of experience and membership of association, personal characteristics of the respondents were not statistically significantly related to inspection of vehicles and vehicle parts before working on them as a safety practice. These findings do not support the DEFENS Study conceptual framework employed by the study which hypothesised that personal characteristics of employees positively relates to outcomes such as OHS practices.

The study examined the relationship between respondents' perceived risk of their job and workplace safety practices and found that respondents' use of PPE was significantly related to perceptions of risk of the job. Respondents who found their jobs risky were found to use PPE more than their counterparts who said their jobs were not risky. The findings of the study demonstrate that awareness of workplace hazards influence the practice of meeting to discuss safety issues by auto-the artisans at Suame Magazine as a safety practice. None of the attributes of workplace safety were found to be statistically significant with awareness of safety hazards. Organisational factors however, showed a strong relationship with OHS practices. All the attributes of safety practices, namely, use of PPE, action taken to ensure safety, meeting to discuss safety issues and inspection of vehicles to identify hazards showed statistically significant relationship with organisational factors. This finding confirms the DEFENS Study conceptual framework employed by the study which indicated that organisational factor positively relates to safety practices such as use of PPE.

WTP for occupational health and safety services

The study found that most of the respondents showed WTP for OHS services, such as the supply of reading materials, training on OHS as well as the services of a medical doctor for examination on workplace injuries and illnesses. However, willingness of the auto-artisans to pay for these services was not related to either their personal characteristics, awareness of workplace hazards, perception of risky job or organisational factors. This is at variance with the DEFENS Study conceptual framework employed by the study which

predicts that personal characteristics, organisational factors, awareness of workplace hazards and perception of risky jobs influence health and safety outcomes such as WTP for OHS services.

Similarly, there was no statistically significant relationship between respondents whose priority was safety at their workplaces and their WTP for reading materials on workplace safety. Again, no statistically significant relationship was found between respondents whose priority was the safety of workers at workplace and their WTP for training on workplace safety. There also was no statistically significant relationship between respondents who said safety was a priority at their workplaces, as well as those who indicated that their workplaces had well-established health and safety culture and their WTP for services of a medical doctor.

Conclusions

The study found that workplace safety was considered highly important across three broad auto-artisanal groups (master artisans, work-and-pay artisans and apprentices) and different artisanal trades at Suame Magazine. This level of importance was found to be due to the fact that there was a high level of awareness of workplace hazards among and also because they perceived their job as risky which was influenced by the orientation on OHS they received. To this end, the artisans adopted several strategies to address their safety concerns. These included personal behaviour adjustments (such as the use of personal protective clothing), intra-occupational collaborations (e.g. organisation of periodic meetings to discuss workplace safety), adherence to standard operational safety guidelines (such as inspecting vehicles and vehicle

parts to assess hazards) and, finally through being willing to procure OHS services (namely provision of reading materials, training on workplace safety and the services of a medical doctor).

During their daily activities, auto-artisans wear PPE to protective themselves from injuries and illness. However, the wearing of PPE was common among respondents who received orientation on OHS. Again, the wearing of PPE was based on the type of auto-artisanal trade one was engaged in and the type of PPE also depended on what an artisan considered relevant to the job he or she was performing.

Activities of auto-artisans were found to be organised based on a hierarchy of occupational statuses involving master artisans, work-and-pay artisans and apprentices. Apprentices learn various artisanal trades under the supervision of master artisans and the work-and-pay artisans for a number of unspecified years. As a result, completion of training of an auto-artisans cannot be predicted as compared to those who learn handicraft in the formal technical institutions. This situation is likely due to the lack of a common curriculum for the training of auto-artisans in the various artisanal trades.

Even though safety was found to be a priority among the auto-artisans, with electrical cords across walkways and slippery floors with oil spillages which makes housekeeping practices at the enclave not meeting the expected house-keeping standards as prescribed by the Workplace Safety and Health Council (2016). This is the result of poor management of space at the workshops which has the potential to lead to accidents and injuries.

Recommendations

Orientation and other educational interventions on OHS for artisans especially, new entrants and apprentices should be restructured. This can be done by the master artisans in a collaboration with the government of Ghana and the Ministry of Trade and Industries to develop a curriculum for the OHS orientation and training programmes which will improve the instructions provided to new entrants and apprentices on OHS. To ensure the success of such training and orientation programmes, reading materials should be made available to the artisans free of charge or at a subsidised rate during the training.

Auto-artisans at Suame magazine should endeavour to use the complete set of PPEs to prevent avoidable accidents. The focus should be on the use of the full complement of standard PPE recommended for industrial workers. As part of this, master auto-artisans procure the set of PPEs for their workers especially apprentices who do not have money to buy the PPEs on their own. This will guarantee the use of complete set of PPEs to maintain a reasonable standard of health and safety.

Housekeeping as a form of safety practice at the various workshops at the enclave was found not to meet the required standard and therefore needs improvement. It is therefore recommended that auto-artisans must ensure proper housekeeping in their garages by properly arranging working tools and vehicle parts to ease movement around the garages to prevent accidents and injuries.

Willingness-to-pay for OHS services was found to be high among respondents. As a result, it is recommended that auto-artisans at Suame

Magazine should solicit assistance from the educational institutions such as Kwame Nkrumah University of Science and Technology, Kumasi Technical University and the Kumasi technical Institute for the design and supply of training materials and training on workplace safety. Assistance should also be sought from the Ghana Health Service for the provision of medical services to the artisans on regular and sustainable basis at a fee. This will help to improve the safety culture and practices of auto-artisans at Suame Magazine.

Reflections on the conceptual framework

The DEFENS Study Conceptual Framework which was adapted for the study hypothesised a relationship between educational module in the form of orientation auto-artisans received and awareness of workplace hazards as well as perception of risky job. It also hypothesised that there is a relationship between awareness of workplace hazards, perception of risky job and safety practices such as use of PPE. These also lead to the adoption of safety practices by artisans. The DEFENS Study Conceptual Framework has been relevant to the study because it identified desired variables which could be used to study the relationship between educational module and awareness of workplace hazards and perception of risky jobs. It also examined the relationship between awareness of workplace hazards, perception of risky job and use of PPE. The conceptual framework also identified the effect of personal characteristics and organisational factors on health and safety practices.

The study has brought to light the importance of educational intervention in creating awareness of workplace hazards among auto-artisans. The study also confirmed the proposition of the DEFENS Study Conceptual

Framework that educational module in the form of orientation on OHS leads to greater perception of the risky nature of the job of auto-artisans. The finding of the study was in agreement with the conceptual framework that auto-artisans who went through orientation on OHS were able to perceive their jobs as risky.

Organisational factors and personal characteristics of auto-artisans in the framework further enhanced understanding of the health and safety behaviour of artisans. For example, the study revealed that organisational factors such as prioritising safety at the workplace and ensuring safety culture at the workplace influence safety practices such as the use of PPE and inspection of vehicles to assess hazards. Personal characteristics such as membership of labour association and age were found to be associated with the use of PPE as a safety practice while at the same time, years of experience of artisans and membership of labour association are related to inspection of hazards to identify or assess hazards as a safety practice.

Membership of labour association as a personal characteristic of auto-artisans as used in the framework was revealed as a determinant of the willingness of auto-artisans to pay for OHS services. The conceptual framework acknowledged the ideals of the concepts of the study such as orientation on workplace safety, awareness of workplace hazards, perception of risky job, occupational factors and safety practices. Through the conceptual framework, the study has also been able to establish the association between orientation of OHS and awareness of workplace hazards, and perception of risky job by auto-artisans. Through the conceptual framework, the study also established the relationship between awareness of workplace hazards, perception of risky job and OHS practices.

However, willingness of auto-artisans to pay to procure OHS services deviates from the predictions of the conceptual framework. As the conceptual framework predicted an association between awareness of workplace hazards, perception of risky job, socio-demographic characteristics as well as organisational factors and WTP for OHS services, the finding of the study indicated that there is no relationship between them. This is likely because irrespective of respondents' socio-demographic characteristics, awareness of workplace hazards or organisational factors they are willing to pay to procure OHS services to ensure their safety at the workplace.

Contribution to knowledge

The study has contributed to literature on OHS. Among the significant contributions of this study to knowledge on OHS of auto-artisans and related issues was the wealth of data generated on the importance of orientation on health and safety to auto-artisans. These include the finding that orientation on workplace safety creates awareness of safety hazards among them and also improves their perception of the risky nature of their job. This has filled the gap in literature on the importance of OHS orientation provided to new entrants into auto-artisanship.

The study has also found that organisational factors have a major role to play in the safety practices of auto-artisans. The study has brought to light the importance of safety culture in creating awareness on workplace hazards among workers. This will augment existing literature on factors which contribute to workplace safety among auto-artisans

Finally, this study has supported existing literature in OHS including the finding that organisational factors positively relate to workplace safety practices. The study also supports existing literature which outlines the importance of safety climate and personal characteristics in the application of safety behaviours and practices at the workplace. Though several studies have been conducted in this area, most of them were based on selected trades at the enclave, however, this current study has added literature on different auto-artisanal trades which hitherto did not exist. Thus, it has enriched existing literature on OHS for both local and international researchers who are interested in investigating the OHS concerns of auto-artisans in Ghana and elsewhere.

Contribution to practice

For the first time in the history of Suame Magazine and auto-artisanship in Ghana, this study has succeeded in profiling all the auto-artisanal trades engaged in as occupations by auto-artisans. This has added new insight into the activities of auto-artisans to existing empirical literature on the different specialities of vehicle repair artisans. The need for knowledge on the types of artisanal trade in Ghana is invaluable because it aids planners and their design for future industrial enclave in Ghana. This will also go a long way to help policy makers to develop policies and programmes which will benefit artisans engaged in the trades identified.

Areas for further research

Though the study found that a few people with secondary and tertiary education are now being attracted to auto-artisanship at Suame Magazine, it failed to investigate reasons for this. It is therefore suggested that further research should examine this into detail to unearth factors which have attracted the few people with tertiary education into auto-artisanship.

Twenty-nine auto-artisanal trades were identified at the Suame Magazine enclave, however, research on OHS among auto-artisans has concentrated on a few such as welding, body spraying, battery repair and fitting. It is therefore recommended that research attention should be shifted to the other lesser-known trades such as, bumper and taillight repair, radiator servicing and drilling to examine the specific health and safety challenges faced by all classes of auto-artisans.

The study found that even though most of the respondents indicated their WTP for OHS services, such willingness is not related to perception of risky job, awareness of workplace hazards, socio-demographic characteristics of respondents nor organisational factors existing at their workshops. The study nonetheless could not examine the reasons for the willingness of auto-artisans to pay for OHS services. It is therefore imperative for a thorough research to unearth reasons for the willingness of auto-artisans to pay for OHS services.

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APPENDIX A

QUESTIONNAIRE

University of Cape Coast

Department of Population and Health

Survey on occupational health and safety

This questionnaire is part of a survey for PhD work in Population and Health being undertaken by Mr. A. B. Adu-Gyamfi a PhD student at the Department of Population and Health, University of Cape Coast. The objective of this research is to assess health and safety issues among artisans at the Suame Magazine enclave. The study is based on selected sample, so your participation is critical. I would therefore be most grateful if you could spare a few minutes of your time to complete this questionnaire. The results of this research will help to identify workplace injuries and diseases among artisans and formulate proposals for the implementation of safety measures to ensure the safety of artisans in the informal economy in Ghana. You are assured that any information you provide will be treated with strict confidentiality. Your anonymity is also guaranteed. Your participation is voluntary.

You were selected as a participant because of your experience as an artisan. We will ask you some questions related to your work, such as common injuries and illnesses and how you protect yourself from them. It will take about 45 minutes of your time. There are no anticipated risks to your participation.

Name of interviewer: Signature:

Date: Time interview started:

Section A: Background date

No.	Question	Response options	Skip
1	Sex	A. Male [ ] B. Female [ ]	
2	Age (in completed years)	……..	
3	Marital Status:	A. Never married [ ] B. Married [ ] C. Cohabitation [ ] D. Separated [ ] E. Divorced [ ] F. Widowed [ ]	

4	Educational Level	A. No formal education [ ] B. Primary [ ] C. JHS/Middle School [ ] D. SHS/Secondary/Technical [ ] E. Tertiary [ ] F. Other (specify) ……	
5	Occupational status	A. Master artisan B. Work and pay artisan C. Apprentice D. Other (Specify) ……	
6	Number of years engaged in artisanship as an occupation		
7	Type of artisanal trade		
8	On the average, how much do you earn from your work?	Day ……. Week ……. Month ……..	
9	Which association do you belong to?	A. Ghana National Association of Garages [ ] B. Magazine Mechanical Association [ ] C. Suame Magazine Industrial Development Organization [ ] D. None [ ] E. Other (specify) ……	

Section B: Forms of occupational hazards. **This section is about the forms of occupational hazard associated with artisanship; indicate by ticking (√) at the appropriate option(s).**

No.	**Question**	**Response options**	**Skip**
10	Are you aware of hazards associated with your work?	A. Yes [ ] B. No [ ]	
11	If you are aware of hazards associated with your work, please state at least three of them		

The following TABLE contains a list of occupational hazards. How often do you encounter these hazards? Select by ticking the appropriate options.

No.	Hazard	Always	Sometimes	Not at all	Does not apply
12	Scratches from vehicle parts and working tools				
13	Particles falling on the eye				

14	Electric shock				
15	Sharp object injuries				
16	Falls				
17	Burns from hot objects and engines				
18	Objects falling from height				
19	Inhaling dust particles				
20	Inhaling particles from paint				

Section C: Effects of hazards. This section is on the health effects of occupational hazards; indicate your view by ticking the appropriate option and write in the spaces provided where applicable.

No.	Question	Response options	Skip
21	Have you ever been involved in any accident at your workshop?	A. Yes [ ] B. No [ ]	
22	If you have ever been involved in any accident leading to injury at your workshop, which of the following did you face? (**Tick as many as possible**)	A. Falling from slippery ground B. Body contact with chemicals C. Stepping on sharp objects D. Objects falling into eyes E. Cuts and scratched from machines F. Inhaling particles from paints G. Electric shock H. Inhaling dust particles I. Other (specify) ……	
23	Have you ever fallen sick because of the hazards from your work?	A. Yes [ ] B. No [ ]	
24	If you have ever fallen sick because of hazards from your work, which of the following conditions did you suffer?	A. Headache [ ] B. Waist Pains [ ] C. Back pain [ ] D. Eyes infections [ ] E. Skin rashes [ ] F. Fracture [ ] G. Burns [ ] H. Other (specify) ……	

25	Do you seek healthcare anytime you suffer diseases or injuries at your workshop?	A. Yes [ ] B. No [ ]	
26	If you seek health care, how often do you seek health care when you get injured or fall sick due to work?	A. Always [ ] B. Sometimes [ ] C. Rarely [ ]	
27	If you seek health care for workplace sickness or injury, where do you seek health care?	A. Hospital B. Drug store C. Clinic D. Herbalist E. Other (specify) ……	
28	If you do not seek health care when you are injured or fall sick at the workplace, what do you do?		

Section D: Health and safety practices. This section touches on health and safety practices at the workplace. Answer the questions below by ticking the appropriate option where applicable.

No.	Question	Response options	Skip
29	Do you take any action to ensure workplace safety?	A. Yes [ ] B. No [ ]	
30	If your answer to question 29 is yes, what actions do you take to ensure workplace safety?		
31	Do you use any protective equipment when working?	A. Yes [ ] B. No [ ]	
32	If you use any protective equipment, what protective equipment do you use? Provide as many as apply.	…… …… …….	
33	If you use protective	A. I buy them myself [ ]	

	equipment, how do you obtain them?	B. They are supplied by government[ ] C. They are given to me by my master[ ] D. They are supplied by my employers [ ] E. They are supplied by NGOs [ ] F. Other (specify) …….	

The TABLE below contains a list of protective equipment. Indicate how often you use any of them during working activities by ticking the appropriate option from the Table.

No.	Protective equipment	Always	Sometimes	Not at all	Does not apply
34	Nose mask				
35	Gloves				
36	Safety boot				
37	Goggles/safety glasses				
38	Safety coat/over all coat				
39	Face mask				

Please indicate your response to the following statements or questions

No.	**Question**	**Response options**	**Skip**
40	If you do not use personal protective equipment, why don't you use them?	A. It is uncomfortable to use [ ] B. I don't have money to buy [ ] C. They are too expensive [ ] D. They are not available [ ] E. Other (Specify) ……	
41	Do you meet with colleague artisans to discuss safety issues?	A. Yes [ ] B. No [ ]	
42	Did you receive any orientation on health and safety when you were first engaged as an artisan?	A. Yes [ ] B. No [ ]	
43	If you received orientation, who organised it?		
44	Have you ever attended training on health and safety practice	A. Yes [ ] B. No [ ]	
45	If you have ever attended training on health and safety, did you pay for the	A. Yes [ ] B. No [ ]	

	training?		
46	Will you pay and attend a similar training on health and safety next time?	A. Yes [ ] B. No [ ]	
47	If you have never attended any health and safety training programme, give reason(s)		
48	Do you have the intention to attend any health and safety training?	A. Yes [ ] B. No [ ]	
49	Do artisans at this workshop attend health and safety training programmes?	A. Yes [ ] B. No [ ]	
50	Have you ever taken part in planning for workplace safety?	A. Yes [ ] B. No [ ]	

51	Is safety of workers a priority at your workshop?	A. Yes [ ] B. No [ ]	
52	Do you consider occupational safety important to your work?	A. Yes [ ] B. No [ ]	
53	Does your workplace have well established health and safety culture?	A. Yes [ ] B. No [ ]	
54	Are you aware that you can suffer workplace injuries and illnesses?	A. Yes [ ] B. No [ ]	
55	Are you aware of any circumstance(s) which can lead to workplace injuries or illnesses at this workshop?	A. Yes [ ] B. No [ ]	
56	State any three common things or circumstances which can lead to injuries or diseases at this workshop	A. B. C.	
57	Have you ever witnessed an accident at this workshop before?	A. Yes [ ] B. No [ ]	
58	Have you ever witnessed an accident at any other workshop before?	A. Yes [ ] B. No [ ]	
59	Which of the following is most important to you?	A. Providing quality service [ ] B. Customers satisfaction [ ]	

		C. A safe workplace [ ] D. Keeping costs down [ ]	
60	Do you have the right tools to work with at your workshop?	A. Yes [ ] B. No [ ]	
61	Do you have enough tools and equipment to work with?	A. Yes [ ] B. No [ ]	
62	Does your job require repeated lifting, pushing, pulling or bending?	A. Yes [ ] B. No [ ]	
63	Do you find your work risky?	A. Yes [ ] B. No [ ]	
64	Do you regularly have pain, or experience stiffness in: • your shoulder, arm or hand	A. Yes [ ] B. No [ ]	
	• your hip, leg or foot	A. Yes [ ] B. No [ ]	
	• your neck	A. Yes [ ] B. No [ ]	
	• your backbone	A. Yes [ ] B. No [ ]	
65	Are you often tired?	A. Yes [ ] B. No [ ]	
66	Do you often feel sleepy at work?	A. Yes [ ] B. No [ ]	
67	Do you regularly suffer from headaches?	A. Yes [ ] B. No [ ]	
68	Do you sometimes have pains in the heart or chest?	A. Yes [ ] B. No [ ]	
69	Do you have problems with your vision?	A. Yes [ ] B. No [ ]	
70	Do you regularly suffer from irritated eyes?	A. Yes [ ] B. No [ ]	
71	Do you often think your work is too difficult?	A. Yes [ ] B. No [ ]	
72	During work, do you suffer from too much noise?	A. Yes [ ] B. No [ ]	
73	Do you have difficulty hearing?	A. Yes [ ] B. No [ ]	
74	Do you often suffer from nose complaints (blocked nose, runny nose or sneezing)?	A. Yes [ ] B. No [ ]	
75	Do you often suffer from respiratory problems (coughing, wheezing, or	A. Yes [ ] B. No [ ]	

	breathing difficulties)?		
76	If you suffer any of the conditions above, do you suspect it is because of the work you do?	A. Yes [ ] B. No [ ]	
77	Do any of the symptoms above affect you while working?	A. Yes [ ] B. No [ ]	
78	If your answer to question 76 is **Yes**, which symptom(s) affect(s) you most? **Provide as many apply**.		
79	While at work, do you experience inconvenience/problem by: • Sitting for long hours • Standing for long hours • Lifting heavy loads • Bending down regularly	 A. Yes [ ] B. No [ ] A. Yes [ ] B. No [ ] A. Yes [ ] B. No [ ] A. Yes [ ] B. No [ ]	
80	Do you experience any challenges during work due to? • Heat	 A. Yes [ ] B. No [ ]	
	• poor lighting system	A. Yes [ ] B. No [ ]	
	• stench	A. Yes [ ] B. No [ ]	
	• dust	A. Yes [ ] B. No [ ]	
	• smoke	A. Yes [ ] B. No [ ]	
81	Are you aware that any of the above conditions can affect your health?	A. Yes [ ] B. No [ ]	
82	Are there sometimes accidents or near misses at the workplace? *(e.g.,* cuts, burns, slipping or stumbling over loose objects)	A. Yes [ ] B. No [ ]	
83	Do you have fire extinguishers at your workshop?	A. Yes [ ] B. No [ ]	
84	Do you have fixed breaks during working hours?	A. Yes [ ] B. No [ ]	
85	Do you have emergency phone numbers (fire service, ambulance)?	A. Yes [ ] B. No [ ]	

86	Do you keep first aid supplies at your workshop?	A. Yes [ ] B. No [ ]	
87	Are any of the workers in this workshop trained on First Aid?	A. Yes [ ] B. No [ ]	
88	Do you have smoke detection system at your workshop?	A. Yes [ ] B. No [ ]	
89	Do you inspect vehicles or parts to assess hazards before working on them?	A. Yes [ ] B. No [ ]	
90	Do you have workers' compensation insurance?	A. Yes [ ] B. No [ ]	
91	Do you think your workshop is safe for your health?	A. Yes [ ] B. No [ ]	
92	Who do you think is responsible for ensuring health and safety at this workshop	A. Me B. My master C. My apprentice D. Government E. District Assembly F. Everyone	
93	What regulatory authorities inspect health and safety at your workshop?		
94	How many times has your workshop been inspected within the last 12 months (2015)?	A. 3 times [ ] B. 2 times [ ] C. Once [ ] D. Never [ ] E. Don't Know [ ]	

SECTION F: Cost of occupational injuries and diseases

No.	Question	Response options	Skip
95	Have you ever been absent from work due to workplace injury or illness?	A. Yes [ ] B. No [ ]	
96	If you have ever been absent from work due to workplace injury, how many days did you absent yourself from work the last time?		
97	Were you able to perform normal activities upon returning to work?	A. Yes [ ] B. No [ ]	
98	Did you lose any income because of being	A. Yes [ ] B. No [ ]	

	absent from work?		
99	Please estimate the loss of income associated with the injury due to reduced labour hours/absence.		
100	Estimate your expenditures (due to medical bills, prescriptions and transportation) in relation to your last injury or sickness		
101	Do you currently suffer pain from an injury you had in the past at your workplace or while working?	A. Yes [ ] B. No [ ]	
102	Did the injury or illness affect your family in any way?	A. Yes [ ] B. No [ ]	
103	If your injury or sickness affected your family, explain how it affected the family		

SECTION G: The following section is about the willingness-to-pay for occupational health services. Kindly respond by ticking the appropriate box where applicable.

No.	Question	Response options	Skip
104	Would you be willing to pay for reading materials on workplace safety?	A. Yes [ ] B. No [ ]	
105	If you will not pay for reading materials on workplace safety state why you will not pay		
106	If you would pay for reading materials on workplace safety, how often would you be willing to pay for them?	A. Daily [ ] B .Weekly [ ] C. Monthly [ ] D. Yearly [ ]	
107	Would you be willing to pay for training on workplace safety?	A. Yes [ ] B. No [ ]	
107B	Would you be willing to pay for occupational health and safety services?	A. Yes [ ] B. No [ ]	
108	If you will pay for workplace safety training, how much would you be willing to pay?		
109	If you will not pay for workplace safety training, why won't you pay?		
110	Would you be willing to pay for a medical doctor to examine you for workplace	A. Yes [ ] B. No [ ]	

	illnesses?		
111	If you will not pay for a medical doctor to examine you for workplace illnesses give your reason(s)		
112	Are you willing to purchase insurance package for yourself to cover workplace injuries and diseases?	A. Yes [ ] B. No [ ]	
113	How much would you be willing to pay for an insurance package for one year?		
114	Do you currently subscribe to the National Health Insurance Scheme?	A. Yes [ ] B. No [ ]	
115	Would you attend workplace safety training if it is organized free of charge?	A. Yes [ ] B. No [ ]	
116	If you would not attend workplace safety training even when it is organized free of charge, why will you not attend?	A. It is a waste of time [ ] B. I can't stop work and attend [ ] C. It will not benefit me [ ] D. I do not need the training [ ] E. Other (specify) …...… …….	
117	Are you aware of the location of a health care facility in this enclave?	A. Yes [ ] B. No [ ]	

Time interview ended:

……..

Thank you for your time.

APPENDIX B: OBSERVATIONAL CHECKLIST

University of Cape Coast

Department of Population and Health

Survey on occupational health and safety

Observation Checklist Date:

Type of trade ……. Name of workshop

……

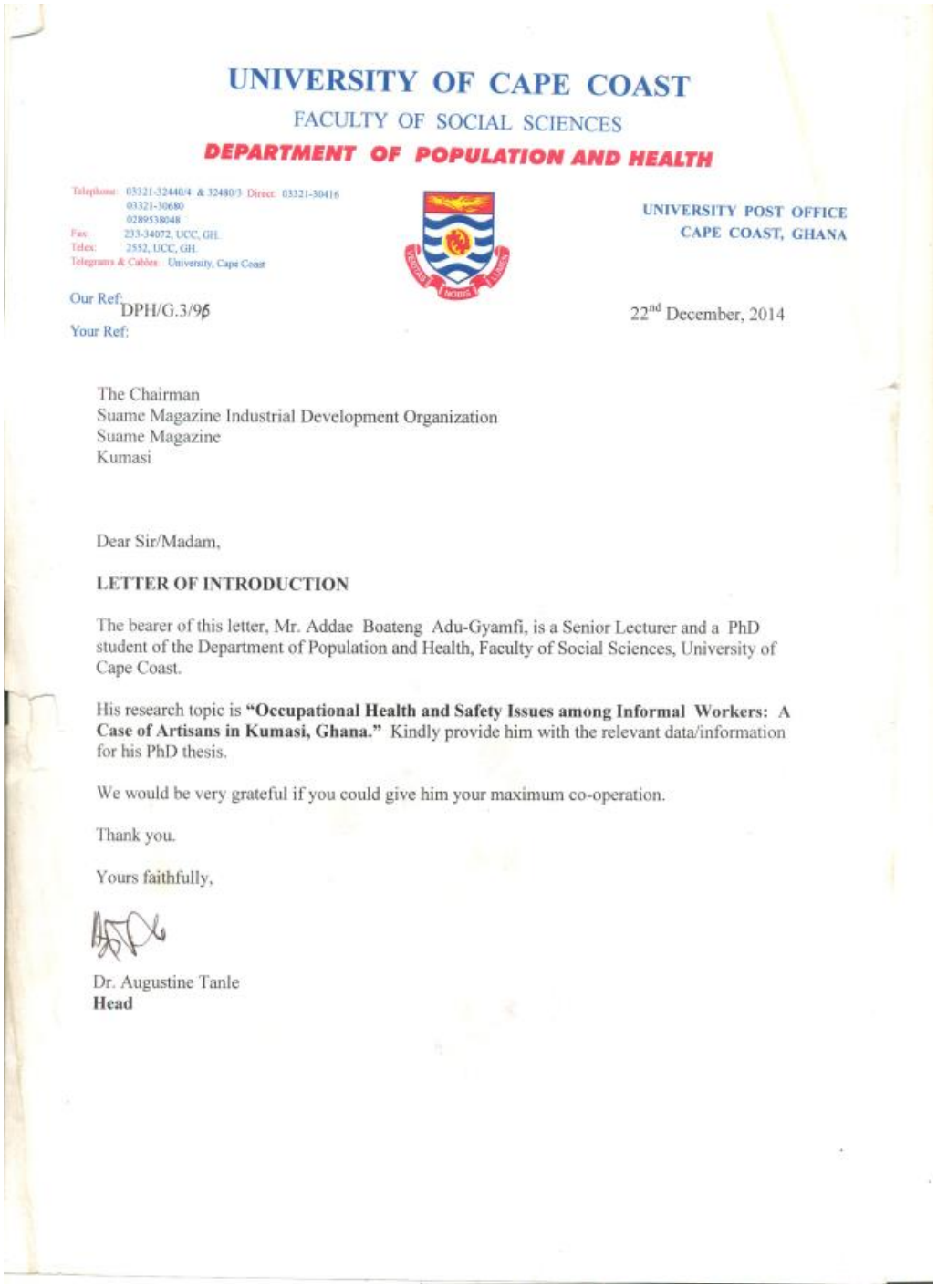
Check whether the following activities or materials occur or are available at the workshop

No	Activity or material	YES	NO	N/A	Comment
1	Are any electrical cords strung across walkways or on walls in the workshop?				
2	If so, are they properly marked and guarded?				
3	Are all available electrical sockets and switches well fitted?				
4	Are vehicle parts scattered around the workplace?				
5	Are there any holes, uncovered drains on floors?				
6	Any protruding nails, splinters, loose boards or projections on the floor				
7	Are all floors free of debris, dust, oil, grease, paint, sand, mud or other slippery traction-robbing material?				
8	Is there good housekeeping, including immediate cleanup of unavoidable spills (oil, water, grease, paint, debris)?				
9	Are there sharp or piecing objects on the ground?				
10	Is there smoke detection system at the workshop?				
11	Does the workshop have a well-furnished first aid box?				
12	Are artisans in the workshop wearing personal protective clothing or equipment? Nose mask Goggles				

	Gloves Face mask Boots Safety coat Helmet				
13	Is there enough light for operations at the workshop?				
14	Is running water available for hand washing?				
15	Do workers wash their hands after completing a task?				
16	Are dusters available to clean hands of oil, grease, water etc. while working?				
17	Do artisans use dusters to clean their hands of oil while they are working?				
18	Do artisans use standard working tools?				
19	Are working tools properly arranged?				
20	Is there enough space for workers to turn around?				
21	Is there too much smoke at the workshop?				
22	Is there too much noise at the workshop?				
23	Are there open fires within or around the workshop?				
24	Do artisans work close to open fire?				
25	Is there smell/scent of chemicals (petrol, oil, paint and others)				
26	Is there a garbage bin in the workshop?				
27	Is there an emergency face/eye wash room at the workshop?				
28	Are fire extinguishers displayed at the workshop?				
29	Are emergency phone numbers displayed at the workshop?				
30	Do artisans engage in repetitive action for long time?				
31	Do artisans sit, stand or squat at awkward position for long time?				
32	Do artisans work in the sun for long hours?				
33	Do artisans inspect vehicles, engines and other vehicle parts for hazards before working on them?				

34	Do artisans wear seat belts when testing of parking vehicles?				
35	Do artisans engage in conversation with other people while working?				
36	Do artisans look elsewhere while working?				
37	Is the attention of artisans distracted by other people while working?				
38	Do artisans concentrate on the job while working?				
39	Is there an assembly point for emergency situations?				

APPENDIX C



UNIVERSITY OF CAPE COAST

FACULTY OF SOCIAL SCIENCES

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UNIVERSITY POST OFFICE
CAPE COAST, GHANA

Our Ref: DPH/G.3/96
Your Ref:

22nd December, 2014

The Chairman
Suame Magazine Industrial Development Organization
Suame Magazine
Kumasi

Dear Sir/Madam,

LETTER OF INTRODUCTION

The bearer of this letter, Mr. Addae Boateng Adu-Gyamfi, is a Senior Lecturer and a PhD student of the Department of Population and Health, Faculty of Social Sciences, University of Cape Coast.

His research topic is **"Occupational Health and Safety Issues among Informal Workers: A Case of Artisans in Kumasi, Ghana."** Kindly provide him with the relevant data/information for his PhD thesis.

We would be very grateful if you could give him your maximum co-operation.

Thank you.

Yours faithfully,

Dr. Augustine Tanle
Head

APPENDIX D

Approval to use DEFENS Study Conceptual Framework

Conceptual Framework

Inbox X

Addae Boateng Adu-Gyamfi <aadu-gyamfi@ucc.edu.gh> 4 Jun 2018, 07:44

to cfriese

Dear Sir,
I am a graduate student from Ghana, I have seen and read one of your articles titled "DEFENS - Drug Exposure Feedback and Education for Nurses' Safety: study protocol for a randomized controlled trial". I am very much interested in the conceptual framework used for the study. However, I am a bit confused and want some little education or explanation from you.

I want to find out the following:
1. Did you develop the framework yourself or it was developed by NIOSH: National Institute for Occupational Safety and Health. ONS: Oncology Nursing Society as the caption under the framework suggests.
2. if you developed it, what title should be given to it when I adopt it for my work?
3. If it was developed by another author, how can I have access to the original framework?
4. If it is your original work how can I seek permission to use it for my work?

I hope to receive a favourable response from you soon.
Thank you in advance.

Christopher Friese <cfriese@umich.edu> 5 Jun 2018, 00:00

to me

Dear Addae,
Thank you for your inquiry. My answers are below.
Cheers, Chris

Christopher R. Friese, PhD, RN, AOCN®, FAAN

Elizabeth Tone Hosmer Professor

Director: Center for Improving Patient and Population Health
University of Michigan School of Nursing
400 North Ingalls, Suite 1174, Ann Arbor, MI 48109-5482
734-647-4308
Email hours (unless urgent): M-F, 8am-6pm EST

Website. On Twitter: @ChrisFriese_RN.

On Mon, Jun 4, 2018 at 3:44 PM Addae Boateng Adu-Gyamfi <aadu-gyamfi@ucc.edu.gh> wrote:
Dear Sir,
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I want to find out the following:
1. Did you develop the framework yourself or it was developed by NIOSH: National Institute for Occupational Safety and Health. ONS: Oncology Nursing Society as the caption under the framework suggests.
Our research team developed the framework.
2. if you developed it, what title should be given to it when I adopt it for my work?
I would title it the DEFENS Study Conceptual Framework
DEFENS: Drug Exposure Feedback and Education for Nurses' Safety
3. If it was developed by another author, how can I have access to the original framework?
not applicable.
4. If it is your original work how can I seek permission to use it for my work?
You have my permission as PI. In any papers or presentations, please cite this publication:
1. Friese CR, Mendelsohn-Victor K, Wen B, et al. DEFENS - Drug Exposure Feedback and Education for Nurses' Safety: study protocol for a randomized controlled trial. Trials. 2015;16(1):171. doi:10.1186/s13063-015-0674-5.