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FACTORS INFLUENCING ADHERENCE TO SAFETY PROTOCOLS IN GHANAIAN INDUSTRIES

BY

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DECLARATION

I, Mavis Adwoa Opong-Addoh, declare that except for other people's investigations which have been duly acknowledged, this work is the result of my own original research and that this dissertation, either in whole or in part has not been presented elsewhere for another degree.

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DEDICATION

This work is dedicated to all who seek to ensure a safer healthier workplace.

ACKNOWLEDGEMENT

My sincere thanks go to the Almighty God for His sustenance and mercies. He is more than enough.

I am very grateful to my supervisor, Dr. Ishmael D. Norman under whose supervision this work became a success.

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To Edward and my course mates I say thank you.

ABSTRACT

Background: Safety in the workplace is very important considering the physical, mental, and financial cost of an unsafe environment. A critical component of safety in the work environment is the adherence of workers to the safety protocols designed for their protection.

Many factories report accidents in spite of the existence of safety protocols in those factories and one of the causes of accidents is known to be violations of safety procedures. This study, which was carried out in May- June 2013 sought to find out the factors that influence the adherence of the workers to safety protocols in factory workers of Unilever Ghana Limited (as a standard) and four other food and beverage producing companies.

Method: A cross sectional quantitative approach was used to determine the knowledge of the respondents on safety protocols. The safety climate of the factories and socio demographic factors influencing adherence to safety protocols was also assessed. The respondents answered a structured questionnaire about adherence to safety protocols, knowledge of safety protocols in the factories, and the safety climate of the factories. Simple random sampling was the sampling method used and the results were analyzed using SPSS version 20 and Stata version 11 software.

Results: The results indicate that Females were more likely to adhere to protocols than males ($p=0.002$). Knowledge positively influences adherence to safety protocols ($p<0.001$). Safety climate components like co-worker safety, supervisor safety and presence of safety protocols also significantly influence adherence to safety protocols at significant levels of $p=0.002$, $p<0.001$ and $p=0.019$ respectively.

Conclusions: The findings indicate that adherence to safety protocols is positively influenced by Knowledge of protocols and safety climate. Adherence to safety protocols can therefore be improved by putting in measures to increase the knowledge and safety climate of the factories.

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LIST OF ABBREVIATIONS

COSHH	Control Of Substances Hazardous to Health
DALYS	Daily Adjusted Life Years
FAO	Food and Agriculture Organization
FID	Factories Inspectorate Division
HACCP	Hazard Analysis and Critical Control Point
ILO	International Labour Organization
MBA	Masters in Business Administration
OSH	Occupational Safety and Health
PNDC	Provisional National Defence Council
TMA	Tema Municipal Assembly
TRFR	Total Recordable Frequency Rate
UGL	Unilever Ghana Limited
WHO	World Health Organization

DEFINITION OF TERMS

Adherence	The fact of behaving according to a particular rule, or following a particular set of beliefs or fixed way of doing something.
Compliance	The practice of obeying rules or requests made by people in authority.
Protocol	A plan or a system of fixed rules for performing a specific task
Safety climate	Workers' perception of management's commitment to workplace safety. Has five (5) components: job safety, co-worker safety , supervisor safety, managements safety and safety policies and programs.

In this study, compliance will be used interchangeably with adherence.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Safety is a basic requirement in every aspect of our lives and is the condition of being protected from a likely cause of danger or risk of injury(Wehmeier, McIntosh, & Turnbull, 2005,p.1289). Workplace safety describes policies and procedures in place to ensure the safety and health of employees within a workplace(Forst, Nickels, & Conroy, 2009, p.169). It involves hazard identification and control according to the national standard and ongoing education and training of employees on safety and health. The safety of an employee is partly his/her own responsibility, since he /she must cooperate with the employer to ensure a safe workplace where their own safety as well as the safety of others who may be affected by what they do, or fail to do, is assured (Alli, 2009, p.19- 21). This implies adequate knowledge of safety procedu9res and the right to stop work in case of imminent danger to safety or health.

The World Health Organization's (WHO) Health for All principles and International Labour Organization's (ILO) conventions on Occupational Safety and Health (No 155,1981) and on Occupational Health Services (No. 161, 1985), start from the principle that

> "Occupational health and safety services should be available and are the right of each individual taking part in work, irrespective of the sector of the economy, size of the company or type of assignment".

Every worker is thus entitled to these services, irrespective of the sector of the economy, size of the company, or type of assignment and occupation (Amponsah-Tawiah, & Dartey- Baah, 2011, p.119).

Accidents threaten the safety of workers and it is estimated that, over two million people worldwide die of occupational injuries and work-related diseases annually (Eijkemans, 2004, p.28-29). These incidents of occupational injuries and work related accidents occur mostly in the developing world since approximately 80% of the global workforce reside in the developing world (Rosenstock, Cullen, & Fingerhut, 2005, p.132).

Globalization involves an increased integration of national economies and policies into the world market (Scholte, 2007, p.6,Stromquist & Monkman, 2000, p.4). It has caused the redistribution of work and re organization and relocation of enterprises to countries where there is cheap labour and laxity of work safety laws. As such, machinery that are obsolete and in poor or hazardous conditions are transported to these developing countries (Goldstein, Helmer, & Fingerhut, 2001, p.56). This outsourcing of the production of goods to countries with cheaper labour, has led to an increase in the number of work related accidents in these countries (Rantanen, Ylikoski, Lehtinen, & Kaadu, 2001, p.2-3). Globalization has also led to changes in the nature of work and people have to deal with increasing work stress (Houtman, Jettinghof, & Cedillo, 2007, p.8).

The ILO Promotional Framework for Occupational Safety and Health (C187, 2006) and its accompanying recommendation define provisions for countries to promote Occupational Safety and Health (OSH).

> "The main pillar of the Convention No.187 is the formulation and development of national OSH programmes. These programmes are strategic time-bound policy documents that focus on specific national priorities for OSH, are based on analyses of the situations in the countries concerned, which should preferably be summarized as national OSH profiles. Such programmes should be developed and endorsed by the highest government authorities and have clear objectives, targets and indicators. Overall, these programs should aim

> to strengthen the entire national OSH system and to foster a preventative approach and safety culture that are critical to achieving sustainability of improvements in safety and health at work".

This can be achieved through national OSH systems and programmes, the building of a preventive safety and health culture and applying a systems approach to the management of OSH (ILO, 2009).

As Ghana moves from an Agrarian economy to an industrialized one it would have been consistent with best practices if Ghana had OSH laws or even policy. Instead there are fragmented legal requirements like The Ghana Labour Act 2003 (Act 651), The Factories Offices and Shops Act 1970 (Act 328), and Workman's Compensation Law 1987(PNDC 187), for different areas of the formal sector.

The Labour Act, 2003 (Act 651) in Section 122 (b) provides that

> "There shall be carried out labour inspection to provide technical information and advice to employers and workers concerning the most effective means of complying with provisions of this Act".
>
> ("Ghana Labour Act," 2003, p. 45)

Labour inspection under the law among others, seeks to identify and enforce breaches to Health and Safety regulations under Section 118 of the Labour Act, 2003 (Act 651) and other legislations. For example, Act 651, part III section 9 (c) of 2003, states that

> "An employer shall take all practicable steps to ensure that the worker is free from risk of personal injury or damage to his or her health during or in the course of the worker's employment or while lawfully on the employer's premises".
>
> ("Ghana Labour Act," 2003, p.10)

Act 651 part III section11 (f) also states that

> "Workers have a duty to take all reasonable care for the safety and health of fellow workers".
>
> ("Ghana Labour Act," 2003, p.11)

Other national researchers have indicated that this places responsibilities on employers as well as workers for ensuring the safety and health of the workforce and work environment (Britwum, Enu-Kwesi, & Akorsu, 2006, p.23).

Workers in Ghana are exposed to work related accidents daily. According to Gyekye (2003), in a study to find the causal tributes of Ghanaian industrial workers for accident occurrence, some of these accidents can be attributed to non existence of safety protocols, safety climate, and limited knowledge of existing protocols by the workers and failure to comply with established workplace protocols (p.38).

Records from the accidents register at the Factories Inspectorate Division (FID) of Tema, though incomplete, shows an increase in reported accidents and fatalities at the factories in Tema. According to the register, the first and second quarters of 2010 each recorded one (1) accident. The third quarter had twenty one (21) reports and the fourth quarter had ten (10) reports. The first quarter of 2011 had ten reported accidents, the second quarter had eighteen (18) reported accidents, and the third and fourth quarters each had six (6) reports. The first and second quarter reports, collated for 2012 had in it twelve (12) and fourteen (14) reported accidents respectively. The disparities in the incidence rates were attributed to the inconsistencies in reporting of safety incidents by the various factories, and the settling of certain cases between the employer and employees without going through due process and without the involvement of the FID (FID, 2012).

The records from the FID also showed that Unilever Ghana Limited did not report any accidents during the stipulated time period. Compared to the other multinationals involved in food processing in the Tema Metropolis, it is the only company entering its sixth -consecutive year without any recordable work related accident.

The factory's own report, which the FID relies on, showed a total recordable frequency rate (TRFR) for accidents of 1.27 accidents per 1 million hours worked in the year 2011, representing a reduction of 22% from 1.63 in year 2010 (Unilever, 2011, p.6). The low incidence of accidents in the factory has been attributed to the adherence to safety protocols by the workers (Britwum et al., 2006, p53 &54).

1.2 STATEMENT OF PROBLEM

On a daily basis about a million workers suffer workplace accidents worldwide and most of these occur in the developing world (ILO, 2009). According to Mason et al in the Health and Safety Executive Manual (1995, p.4), violations of safety procedures are a significant cause of many industrial accidents.

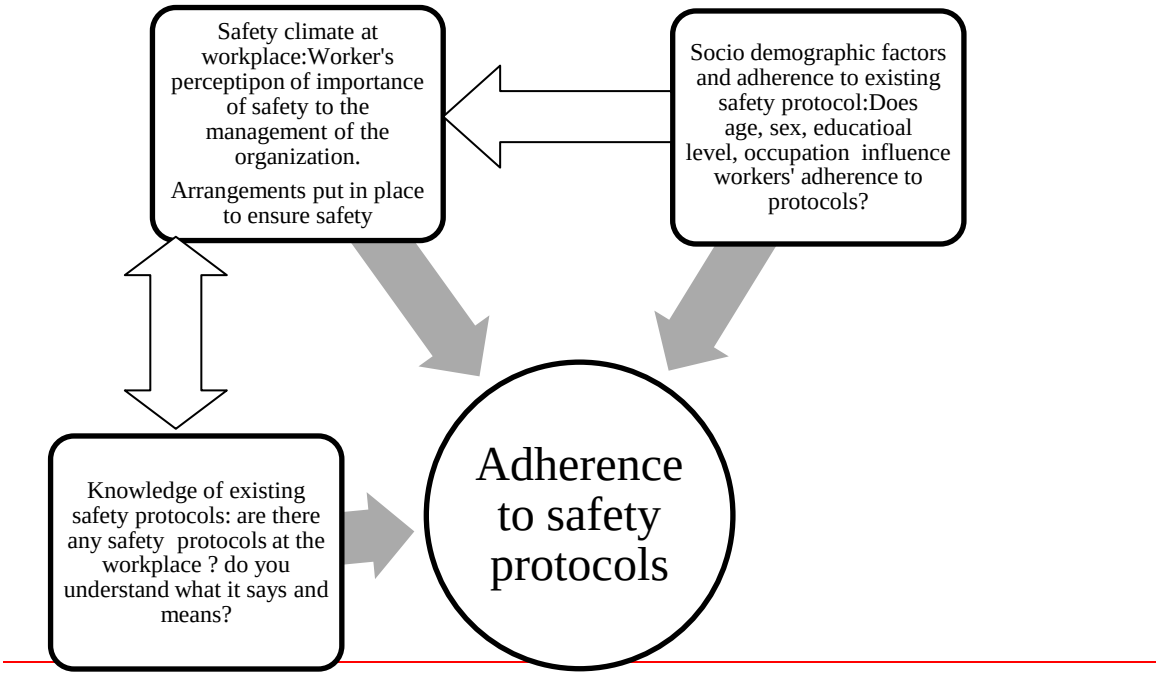
In Ghana the total number of 18,454 workers made financial claims due to workplace injuries between 2008 and 2010 (Norman, Aikins, Binka, & London, 2012, p.13). It can be inferred from the study that the figure for injuries is bigger than those who actually bothered to make claims since some workers do not make claims for their injuries. From the accidents register of the F I D at Tema, the incidence of accidents in Tema has increased. Although accidents generally persist in factories, some factories have not reported any accidents at the workplace to the FID and their personal record show a reduced number of accidents per million working hours than most. The FID reports that a factory such as Unilever Ghana Limited has consistently been one of the factories with low reported accident rates. Further research to find out what they are doing right, particularly what they are doing for the workers to adhere to the safety protocols, will help others to emulate and reduce work related accidents.

1.3 CONCEPTUAL FRAMEWORK

The behaviour being assessed is whether or not the workers adhere to protocols. The factors influencing it are:

1. Safety climate. Do the workers perceive that the management take matters concerning their safety seriously? Have items been provided for their safety? Is there frequent training concerning safety? Are there rewards for being safe?
2. Knowledge of existing safety procedures: are there any existing procedures? Do they conform to the international standards? Are the workers aware of their existence? Do they comply with them? Do they find a need for them or do they consider them cumbersome?
3. Socio demographics: Does age, work experience, sex or educational level have an effect on the way workers adhere to the laid down protocols?

Fig 1.1 Conceptual Framework for Factors Influencing Adherence to Safety Protocols



1.4 JUSTIFICATION

Although there are fewer new industries per year since the 1990's in Ghana, many industrial accidents have occurred in recent times, with resulting injuries, deformities and sometimes death.

The number of factory related accidents increased from 10 with no fatalities in 2009, to 34 with one fatality in 2010 and 45 with 5 fatalities in 2011. As at the end of the second quarter of 2012, the FID had already recorded 29 reported factory related accidents ("Accident register", 2012). Most of the incidents are avoidable and results in loss of time money and sometimes life.

This study sought to find out what has been instituted by the factory of choice to increase the adherence to safety protocols and reduce the incidence of accidents. This would help to inform policy and institute measures to help improve adherence to safety protocols.

The study concentrates on large scale food and/or beverage manufacturing companies because whatever happens there has a direct impact on the health of the general public, who are the consumers of their products.

1.5 OBJECTIVES

1.5.1 General objective:

The general objective of the study was to determine the factors influencing workers' adherence to safety protocols.

1.5.2 Specific objectives: the specific objectives were:

- To assess the knowledge of workers on existing safety protocols at the workplace.
- To assess the effect of socio demographic factors on adherence to safety protocols.
- To assess the relationship between safety climate and worker's adherence to safety protocols.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Overview

On the international national and individual front, the human, social and economic cost of workplace accidents is of great concern (Alli, 2009, p. 3). An estimated 270 million occupational accidents both fatal and non-fatal, occur annually worldwide (Hämäläinen, Takala, & Saarela, 2006,p.143).

According to World Health Organization (WHO) and the ILO, the incidence of industrial accidents in Western industrialized countries is decreasing whilst that in developing countries has either plateaued or is on the increase. The last 100 years have seen a substantial reduction in the number of work-related deaths and injuries, at least in western industrialized nations. This could be attributed in part to the shift or relocation of the manufacturing aspects of enterprises to countries with cheap labour and non stringent occupational health and safety laws (Rantanen et al., 2002, p.2). These less developed countries also have obsolete machines being dumped there for use which in itself is hazardous (Goldstein et al., 2001, p. 56). Nevertheless, fatalities and injuries on the job still occur at unacceptably high rates in both industrial and developing countries. The global estimates of occupational accidents differ according to the different countries.

The established market economies reported a total occupational accident fatality rate of 4.2 with countries like Canada Spain United States and Portugal having higher rates than The United Kingdom though The United Kingdom employs more people. This could be explained in part as being due to The United Kingdom employing more people in the service industry than manufacturing industry thus limiting the number of

workers exposed to more dangerous working conditions (Hämäläinen, Takala, Saarela, 2006 p.145).

A study by Song et al, (2011, p.85) on the longitudinal relationship between economic growth and occupational accidents in China from 1979-2008 concluded that variation in economic speed had an influence on occupational accidents. This could possibly account for the reported 10.5 per 100,000 fatalities and 8,028 accidents per 100,000 workers in China (Alli, 2009, p. 4).

Approximately 54000 fatal occupational accidents happen annually. There are a 21 per 100,000 fatality rate and 16,000 per 100000 workers accident rate. This translates into 54,000 workers dying each year and 42 million work related accidents that cause at least three day absence from work (Hämäläinen, Saarela, & Takala, 2006, p. 147). The situation in Sub-Saharan Africa is even more precarious due to the fact that according to Nordberg (2000) in a study of injuries as a public health problem in Sub Saharan Africa, the burden and patterns of injuries in Africa and other poorly developed areas have not been adequately studied.

The economic costs of these deaths and injuries are astronomical, at the company, national and even global level. Taking into account the lost working time, interruption in production, compensation to be paid to the worker and dependent, training and retraining, medical expenses and so on, an estimated 4 per cent or more of Gross National Product (GNP) annually is what these losses are pegged globally (Takala, 2002, p.7).

It has been demonstrated by the continuously reduced accident rates in the industrialized countries that occupational and industrial accidents are all caused by

preventable factors which can be eliminated by implementing known and available measures and methods.

Thus the application and implementation of protocols aimed at preventing accidents is of both social and economic benefit.

2.2 Knowledge of Safety Protocols and adherence

From the United Nations Declaration of human rights 1948, Article 23, everyone has the right to work, to free choice of employment, to just and favourable conditions of work. Article 7 of the 1976 United Nations International Covenant on Economic, Social and Cultural Rights reaffirms this position that working in a safe and healthy environment is a human right. Decent work thus implies safe work and workers also have a duty to take care of their own safety as well as the safety of anyone who might be affected by what they do or fail to do.

Most industries have a generic safety protocol that is tailored to that particular industry. For example the Hazard Analysis and Critical Control Point (HACCP) are designed for factories that produce foods and food products. It provides guidelines for the handling of food and food products from raw material production, procurement and handling, to manufacturing, distribution and consumption of the finished product. The HACCP system, which is science based and systematic, identifies specific hazards and measures for their control to ensure the safety of food. HACCP is a tool to assess hazards and establish control systems that focus on prevention rather than relying mainly on end-product testing. Any HACCP system should be capable of accommodating change, such as advances in equipment design, processing procedures or technological developments. (FAO, 1998 , section 3). The Control of Substances Hazardous to Health (COSHH) is another internationally accepted guideline which

requires employers to control the substances that may cause harm to their employees and consumers. Since most businesses use substances, or products that are mixtures of substances, some processes may create substances that could cause harm to employees, contractors and other people (HSE, 2011).

There are other protocols which are relevant to different aspects of the workplace including electrical, noise, ergonomics, working from heights, personal protective equipments, machinery and plants, pressure equipments and so on.

Policies should be supported by procedures which provide the step-by-step instructions on how policies will be achieved.

Christian et al, (2009) in a study to examine person and situation based antecedents of safety performance behaviours and outcomes (accidents and injuries), concluded that safety knowledge and safety motivation were most strongly related to safety performance behaviours such as adherence to safety protocols (Christian, Bradley, Wallace, & Burke, 2009, p.1103).

Jawaid et al in a study conducted in Iran to assess the knowledge , attitude and compliance of doctors in tertiary care hospital in Karachi with standard precautions concluded that awareness programmes aimed at improving the knowledge of the workers on the safety protocols will improve compliance (Jawaid, Iqbal, & Shahbaz, 2009, p.87).

2.3 Sociodemographic Factors and adherence to protocols

According to Aderaw, Engdaw, & Tadesse (2011, p. 7), in a study done in Ethiopia on the determinants of occupational injuries among textile factory workers, men had a higher risk of occupational injury than women in manufacturing industries.

Males are about 2.5 times more likely to sustain injuries at work due to their tendency to engage in risky behaviour.

Working at younger age increases the risk of sustaining more occupational injury among factory workers compared with older workers (Bhattacherjee et al., 2003,p.388). Similarly this study revealed that workers in age group below 30 years old were about 1.9 times more likely to report occupational injury than workers whose age group was 30 years and above. This can be explained as due to the fact that inaccessibility to health and safety information, lack of training on health and safety, less work experience, low level of knowledge and skill towards the work among young workers.

According to Bhattacherjee (2003,p.390), in a study conducted to assess the associations of some individual factors and occupational injuries in North-Eastern France concluded that job categories also influenced likelihood of having accidents with the executives and professionals having accident rates of 1.2% whilst labourers had an accident rate of about 8.3%.

Gyekye and Saminen, (2009, p.171) also found an association between educational level and safety behaviour of workers using multivariate analysis the study concluded that higher educated workers were the most compliant with safety procedures and recorded the lowest accident involvement rate.

2.4 Safety climate and Adherence to safety protocols

In a study of the impact of organizational climate on safety climate and individual behaviour, Neal, Griffith and Hart (2000, p.100) said that 'safety climate is a specific form of organizational climate, which describes individual perceptions of the value of safety in the work environment'. The factors identified as being components of safety

climate include management concern for employee wellbeing, adequacy of training, provision of safety equipment, quality of safety management systems, communication and employee involvement in workplace safety and health ((Neal, Griffin, & Hart, 2000 , p.100).

In another study of the lagged relationship among safety climate, safety motivation, safety behaviour and accidents at the individual and group levels in Australian hospital employees, Safety climate was linked to a number of safety-related outcomes, including to performance of safe work practices (Griffin & Neal, 2000, p. 951, Neal & Griffin, 2004). Safety related policies and programs of an organization that can be viewed as the surface manifestations of the basic values and beliefs of the organization concerning workplace safety include policies related to compliance to safety standards, safety training, availability of resources for safety and safety performance feedback (DeJoy, Schaffer, Wilson, Vandenberg, & Butts, 2004,p.82).

In a study by Barling and Hutchinson (2000, p.83) to investigate the extent to which commitment versus control-based safety practices and occupational safety reputation influence perceived safety climate among full time students of an executive MBA program, it was concluded that safety related policies and programs should comprise the employees perceptions about the importance ascribed to safety at their workplace, and perhaps the extent to which management can be trusted to do their best to provide working condition and safe work practices. Literature from Silva, Lima, & Baptista, (2004, p.216) in a study to address the characterisation of both organizational climate and safety climate among different Portuguese organizations show that safety climate impacts on workers' safety behaviour and accident involvement rate.

In a study by Hofmann, Morgeson, & Gerras (2003, p.170) on climate as the moderator between leader member exchange and content specific citizenship suggests that employees with negative perceptions of their safety climate (increased work pressure and workload) tend to engage in unsafe acts thereby increasing their susceptibility to accident . Also according to Probst (2001,p.211) in a laboratory experiment which manipulated layoffs in a simulated organization, workers who perceive job insecurity, anxiety and stress have a drop in safety motivation and record a relatively higher accident rate.

In a study to investigate workers' perceptions of workplace safety in an African environment, specifically Ghanaian work places Gyekye (2006, p.32), observed that workers with positive perceptions about safety climate have been reported to have greater job satisfaction and lower accident rates. According to Alli (2009, p.17) employers have a responsibility of ensuring a safe work environment through the prevention and protection of workers from occupational hazards. They also need to ensure workers are complying with laid down safety protocols and procedures. Adequate supervision when it comes to safety procedures, adequate technology and machinery, provision of personal protective equipments and regular safety training is essential for occupational safety and is the responsibility of the employer. The employer also has a responsibility to provide necessary first aid facilities should accidents and emergencies occur. Adequate arrangements should also be made by the employer for compensation of work-related injuries and diseases, as well as for rehabilitation and to facilitate a prompt return to work.

According to Gershon et al (2000) in study a conducted at Mexico to assess the relationship of hospital safety climate with compliance with safe work practices and to develop a hospital based safety assessment tool, adherence to safety regulations is

significantly influenced by absence of workplace barriers to Safe work practices, availability of personal protective equipments, frequent in service trainings and a perception of the management's commitment to safety (Gershon et al.,2000,p.211) . In a study conducted to assess the association between perceived safety climate and compliance to safety procedures in an urban emergency medical service system, Eliseo et al (2012) reported that using multiple logistic regression analysis, there was an association between perceived safety climate and strict adherence to safety protocols . There was also a strong association between frequent safety-related feedback/ training and adherence to safer workplace behaviour (Eliseo et al., 2011, p.53).

CHAPTER THREE

3.0 METHODS

3.1 Type of Study

This was a cross sectional study which looked at the factors influencing adherence to safety protocols in Ghanaian industries, with Unilever Ghana Limited set as the standard. Four other food and beverages production companies in Tema were randomly selected out of a total of twenty one (21) beverage producing companies in Tema. These companies were selected based on the similarities in characteristics as Unilever Ghana Limited. These characteristics were having a functional factory with workers running a three shift system, the presence of a multinational mother company, and having low records of accidents in the records of the Factories Inspectorate Division. These companies were given the designations A, B, C and D[*] . The data was collected from workers of the factory shop floor, the supervisors and the managers of the various factories. The data was collected using a structured questionnaire, and analyzed using SPSS version 20 and Stata version 11 software.

3.2 Study Location/Area:

Tema is an industrial city in Ghana and forms part of the Greater Accra Region. The region is the smallest of the ten (10) administrative regions in terms of area, occupying a total land surface of 3,245 square kilometres which is 1.4 percent of the total land area of Ghana.

[*] The actual names of the companies were omitted as a prerequisite for obtaining permission to undertake the project/survey there.

Tema, which serves as the administrative capital of the Tema Metropolitan Area (TMA) is a coastal city situated 25 kilometres east of Accra, the national capital. The Greenwich Meridian (00 Longitude) passes through the city of Tema.

The metropolis shares common boundaries with the Accra Metropolis on the West, the Ga Municipalities on the North West and the Dangme West District on the northern and eastern borders. It is bordered to the south by the Gulf of Guinea. Until 1952, when the Government of Ghana decided to develop a deep seaport there, Tema was a small fishing village. Tema became an Autonomous Council in 1974 and was elevated to the status of a Metropolitan Assembly in December, 1990.

As of 2012, Tema is the eleventh most populous settlement in Ghana, in terms of population, and has a population of approximately 160,939 people. There are a total number of 82 registered factories in Tema, including the five multinational factories mentioned above. Most of the occupational accidents in recent times have unfortunately been reported from Tema.

3.3 Variables

The dependent variable was adherence to safety protocols. Whether or not the workers adhered to safety protocols was assessed.

The independent variables are:

Safety climate- This is the perception of the workers of the safety commitment of the management and is measured using a work safety scale developed and validated by Hayes, Perander, Smecko, & Trask (1998).

Knowledge and comprehension of safety protocols- the level of knowledge and adherence of the workers is assessed using the Likert scale generic rule set adapted from Maison et al, (2001).

Sociodemographic factors of the workers- The of factors such age, sex, educational level and occupation on the adherence to safety protocols.

3.4 Study Population:

The study population was made up of 1002 factory workers of Unilever Ghana Limited, Company A, B, C, and D. This is because they are all multinational companies located in Tema and are involved in food and drink production. These food and drink factories are of interest because their products are directly consumed by the general public.

3.4.1 Eligibility criteria

The following were the eligibility criteria for recruitment into the study

1. Participants should be factory workers in active service for the above mentioned factories
2. Participants must be workers of the factory floor (operations, supervisors , managers)
3. Participants must give voluntary informed consent to participate in the study

3.5 Sample Size

No data on the level of adherence of protocols in the factories were available, thus it would be assumed to be 50%.

The sample size was calculated using Cochran's (1977) correction Formula, $=\frac{n}{1+n/N}$, where $n=\frac{Z^2\,pq}{d^2}$

N=total number of workers in the Unilever factory in Tema=392.The number of workers I was allowed access to in Companies A, B, C and D were 200.60, 150 and 200 respectively.

Z= confidence interval of 95%

p= prevalence of work related accidents in Unilever

q=1-p

d=margin of error

$n=\frac{(1.96)2(0.5)(0.5)}{0.05^2}$ =384

Sample size for project=$\frac{384}{1+384/1002}$=277

However, considering a non-response rate of 10% the figure was rounded off to **300.**

Table 3.1 Individual and overall sample population of respondents

Company	Population	Proportion	Sample Size
Unilever	392	$\frac{392}{1002} \times 300$	118
Company A	200	$\frac{200}{1002} \times 300$	59
Company B	60	$\frac{60}{1002} \times 300$	18
Company C	150	$\frac{150}{1002} \times 300$	45
Company D	200	$\frac{200}{1002} \times 300$	59
Total	1002		300

3.6 Sampling method

Simple random sampling method was used to determine the workers who would participate in the study. The number of employees present on the factory floor at the time of the study was collected from the companies, and all those willing to participate in the study were asked to ballot for placement in the study. Verbal or written consent was obtained from them and the questionnaires were then administered.

3.7 Data collection Tools

Structured questionnaires were used for the data collection. The purpose of the study was explained to participants and they were assured of confidentiality. The structured questionnaires were then administered to consenting participants by two trained research assistants. The questionnaire consisting of Sixty (60) items was used to assess the knowledge of safety procedures, effect of Sociodemographic characteristics on safety behaviours and perceptions of the workers, the safety climate of the company and adherence to safety protocols. Employees responded on a five (5) point scale to all items ranging from 1 (strongly disagree) to 5 (strongly agree).

According to Rovai (2002), Likert scale questions are recommended for studies aimed at assessing people's attitudes and perceptions of a variety of social and organisational events.

3.8 Data Collection procedure

The research team comprised the principal investigator and the research assistants. For Unilever and company A, one worker from the factory (a manager) was asked to supervise the process and help us around the facility. For companies B, C, and D, the questionnaires were administered in their free time. The procedure was explained to the participants in English. The informed consent to be signed was explained to them. The participants willing to answer the questionnaires were taken through the questions one after the other. Other participants requested to take the questionnaires home; self administer it and bring it on the next shift. The study was conducted within the factories from the first week in the month of May to the first week in June.

3.9 Quality control

To control the quality of the data certain measures were instituted to ensure validity and accuracy of results. The two research assistants were trained on how to collect and enter data, and they were checked to see if they were asking the questions correctly. However because all the participants were literate, understanding the questions were relatively easy. Questions from the work safety scale modified by Hayes et al were used. The questionnaires were reviewed, corrected and compressed with my supervisor's permission. Pre testing was done on factory workers in Fan Milk Ghana Limited which is also a Multinational Company involved in food production, to correct disparities and ambiguities.

3.10 Data Processing and Analysis

3.10.1 Data Entry

The data collected was entered using SPSS version 20.0 software. Accuracy of the data input was checked through the use of this software. Each questionnaire was given a number for easy reference.

3.10.2 Statistical analysis

After editing, cleaning and coding, the data was analyzed using the version 20 of the SPSS soft ware. The mean and proportions of the socio demographic factors were presented in tables. The knowledge, adherence levels and safety climate of the various respondents were compared using the Mann Whitney tests and Kruskal Wallis tests. Associations between the dependent and independent variables were determined using bivariate analysis.

Variables with a p value < 0.05 during the bivariate analysis were included in the logistic regression analysis to determine the strength of association between the dependent variables and independent variables.

Results were represented in tables and graphs.

3.11 Limitations of study

The study had limitations because all the Multinational companies involved in food production in Tema Metropolis could not be sampled. The study was thus limited to five mentioned above. The sample therefore could be biased. Some respondents self administered the questionnaires and others had it being administered to them by the research assistants. This is likely to affect the uniformity of the data collection. Some

companies insisted on restricting access to certain portions of the factories thus making it difficult to generalize results obtained in those companies.

Despite these limitations, the study will contribute to the knowledge of factors that influence adherence to safety protocols in Factories.

3.12 Ethical Consideration

Ethical clearance was obtained from the Ghana Health Service Ethical Review Committee through the Academic Board of the School of Public Health. The identification number for the clearance was GHS-ERC; 68/03/13.

Permission was sought from Unilever Ghana and the four other companies for the study to be conducted in their organization. This was done by the Biological, Environmental and Occupational Health Department (BEOHS) before the commencement of the study. Informed consent was obtained from the factory workers used for the study. The objectives and benefits of the study were explained to them. All participants gave written or oral consent before the questionnaire was administered.

Confidentiality was maintained and the identity and any information of the participants were not disclosed. To ensure anonymity the names of the other factories have not been disclosed as requested and no name was put on the questionnaires.

The participants were not paid for participating in the study.

CHAPTER FOUR

4.0 RESULTS

The study which assessed the factors influencing adherence to safety protocols by factory workers, was conducted among workers of the Tema factories of Unilever Ghana, and other large scale food and beverage producing companies designated Company A, Company B, Company C and Company D

4.1 Basic Socio demographic characteristics of respondents

Table 4.1 depicts the demographic characteristics of the respondents. A total of 241 out of the 300 respondents answered the questionnaires. The mean age of the 241 respondents was 33.5years +/- 9.42SD. The median age was 32 years with a minimum of 19 years and a maximum of 57 years. There appeared to be more males [167(63.7%)] than females [74(30.7%)] in all the companies that took part in the study, except in company D. It was discovered that 16.2% of the respondents had education below the diploma level, with the least educational qualification among the respondents being certificate level (SSCE and vocational/ technical school).

About 77.5% of the respondents were workers at the factory floor and the supervisors were 18.7% with Managers registering 3.7% of the study population.

Table 4.1 .Sociodemographic Characteristics Of Respondents (Percentages in parenthesis)

Variables	FREQUENCIES (%)					
	Unilever Ghana N=90	**Company A N=54**	**Company B N=17**	**Company C N=25**	**Company D N=55**	**Total N=241**
Age						
18-30	23(25.6)	28(51.9)	9(52.9)	8(32.0)	43(78.2)	111(45.9)
31-40	25(27.8)	19(35.2)	7(41.2)	14(56.0)	11(20.0)	76(31.4)
41-50	24(26.7)	7(13.0)	1(5.9)	3(12.0)	1(1.8)	36(14.9)
51-60	18(20.0)	-	-		-	18(7.4)
Gender						
Male	73(81.1)	32(59.3)	14(82.4)	21(84.0)	27(49.1)	167(69.3)
Female	17(18.9)	22(40.7)	3(17.6)	4(166.0)	28(50.9)	74 (30.7)
Marital status						
Single	42(46.7)	19(35.2)	9(52.9)	11(44.0)	30(54.5)	103(42.7)
Married	33(36.7)	28(51.9)	7(41.2)	12(48.0)	23(41.80	111(46.1)
Divorced	12(13.3)	5(9.3)	1(5.9	1(4.0)	2(3.6)	21(8.7)
other	3(3.3)	2(3.7)	-	1(4.0)		8(2.5)
Education						
Certificate	-	4(7.4)	7(41.2)	2(8.0)	26(47.3)	37(16.2)
Diploma	10(11.1)	18(33.3)	-	8(32.0)	2138.3)	57(23.7)
HND	45(50.0)	18(33.3)	7(41.2)	9(36.0)	6(10.9)	85(35.3)
Degree	35(38.9)	14(26.0)	2(17.6)	6(24.0)	2(3.6)	60(28.5)
Rank						
Operator	87(96.7)	26(48.1)	15(88.2)	20(80.0)	39(70.9)	187(77.5)
Supervisor	2(2.2)	25(46.3)	1(5.88)	4(16.0)	13(23.6)	45(18.7)
Manager	1(1.1)	3(5.6)	1(5.88)	1(4.0)	3(5.4)	9(3.7)

In table 4.2, it was noted that there was no statistically significant difference between single persons and married or divorced individuals when it came to adherence to protocols. It however seems that there is a very significant difference ($p<0.001$) in the association of the different age groups with adherence to protocols. Educational level and rank also showed significant associations with adherence to safety protocols ($p=0.035$, $p= 0.013$ respectively).

Table 4.2Relationship between Sociodemographic factors and adherence to protocol

VARIABLE		**Frequency (%) N=241**	**Adherence to Safety Protocols(%) N=102**	**χ^2, P value**
AGE	18-30	111(45.9)	32(31.4)	21.912,p<0.001
	31-40	76(31.4)	34(33.3)	
	41-50	36(14.9)	25(24.5)	
	51-60	18(7.4)	11(10.9)	
GENDER	Male	167(69.3)	82(80.4)	10.26, p<0.001
	Female	74 (30.7)	20(19.6)	
MARITAL STATUS	Married	103(42.7)	40(39.2)	2.840, p=0.417
	Single	111(46.1)	47(46.1)	
	Divorced	21(8.7)	11(10.9)	
	Other	21(8.7)	4(3.9)	
EDUCATION	Certificate	37(16.2)	9	10.366,p=0.035
	Diploma	57(23.7)	22	
	HND	85(35.3)	44	
	Degree	60(28.5)	27	
OCCUPATION/RANK	Operator	187(78.4)	89	8.7, p=0.013
	Supervisor	44(18.3)	12	
	Manager	8(3.3)	1	

Table 4.3 shows that compared to males, females have a 2.60 times higher odds ($p=0.002$) of adhering to safety protocols.

The odds of supervisors adhering to safety protocols was 0.4 times lower compared to the odds of operations staff adhering to protocols. However no significant differences were noted between managers and operations staff when it came to adhering to protocols

Compared to certificate holders, HND holders had a 3.577 times higher odds (p=0.004), and degree holders had a 2.813 times higher odds (p=0.025) of adhering to safety protocols. The difference in adherence to protocols between diploma holders and certificate holders was not statistically significant.

Table 4.3 Sociodemographic Factors which influenced Adherence

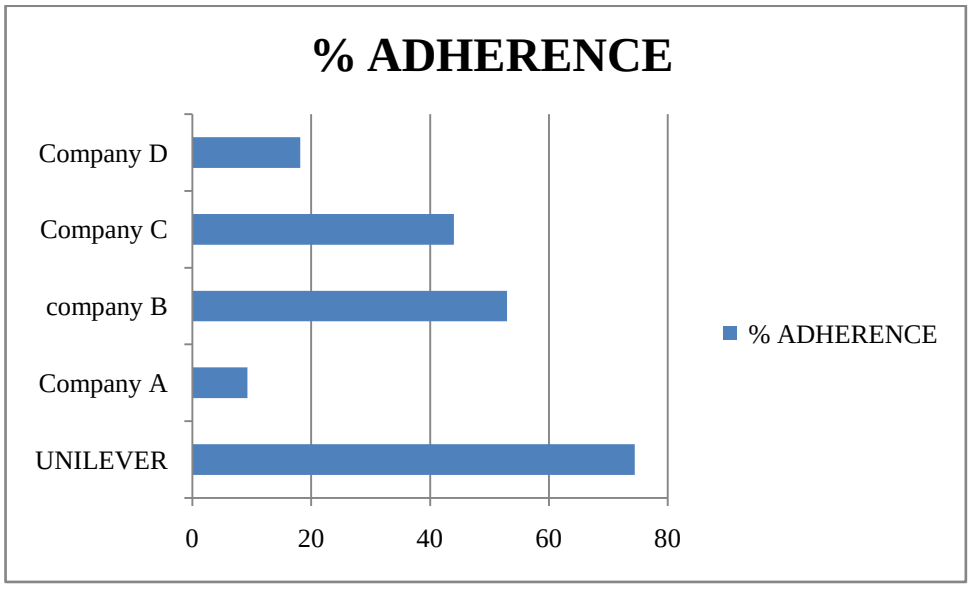
Socio demographics	Odds ratio	(95%CI)	P-Value
Educational level			
Certificate	Ref		
Diploma	2.095	0.838-5.237	0.114
HND	3.577	1.517-8.435	0.004**
Degree	2.813	1.139-6.945	0.025*
Rank			
Operations	Ref		
Supervisors	0.421	0.205-0.868	0.019*
managers	0.161	0.019-1.330	0.090
Age			
18-30	Ref		
31-40	1.999	1.085-3.681	0.026*
41-50	5.611	2.472-12.733	0.000***
51-60	3.879	1.381-10.897	0.010*
Gender			
Male	Ref		
Female	2.605	1.436-4.727	0.002**

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

4.2 Adherence to safety

A chi square test analysis on the data collected clearly shows significant differences ($p<0.001$) in adherence to protocols between the different factories surveyed. The different levels of adherence to protocols among the factories is shown in figure 4.1. Adherence to protocols was found to be highest in workers of Unilever Ghana Limited (74.44%). It was higher than the least ranking factory (Company A) by about 65.18%.

Fig 4.1 Adherence To Safety Protocols Stratified By Company



4.3 Knowledge of workers of existing safety protocols

By conducting a two independent sample analysis and multiple independent sample analysis as found in Tables 4.4 and Table 4.5 (Mann Whitney and Kruskal Wallis), it was found that workers from Unilever Ghana Limited had significantly higher knowledge (68.89%) of the existing protocols than Company A (25.93%), C (16.00%) and D (25.45%) ($p<0.001$). The knowledge of unilever workers as compared with company B is however not statistically different ($p=0.880$)

Table 4.4 Knowledge Of Workers On Safety Protocols Stratified By Company

FACTORY	Mean Rank(Mann-Whitney U	Sum of ranks	(P value)
Unilever	84.10	1386.000	<0.001
Company A	53.17		
Unilever	53.86	752.000	0.890
Company B	54.76		
Unilever	64.61	530.000	<0.001
Company C	34.20		
Unilever	84.94	1400.500	<0.001
Company D	53.45		

Table 4.5 Knowledge of workers on safety protocols compared together

	(Kruskal Wallis H)	Percentage knowledge	Chi square	
Unilever	151.01	**68.89**	**50.090**	**<0.001**
Company A	99.24	**25.93**		
Company B	153.06	**70.59**		
Company C	87.28	**16.00**		
Company D	98.07	**25.45**		

4.4 Safety climate at factories

Table 4.6 illustrates the overall safety climate. There are significant differences in the Safety climate of the various factories with co worker safety and supervisor safety showing higher levels difference ($p<0.001$) followed by presence of safety procedures and job safety ($p=0.006$, $p=0.014$) respectively. These statistics were obtained by subjecting the data to a multiple independent sample test (table 4.6).

There was no significant difference in the management safety climate between the various factories. It can again be seen that company B seems to have the higher mean rank but cognisance should be taken of the fact that they have a smaller sample size. Factory C recorded the highest mean rank for job safety. This is attributed to the fact that they saw their jobs as being more dangerous.

Table 4.6 Overall safety climate of various companies (Kruskal Wallis tests)

	UNILEVER N=90	**Company A** N=54	**Company B** N=17	**Company C** N=25	**Company D** N=55	χ^2,P Value
Job safety	125.88	115.17	96.26	152.12	112.25	12.439,0.014
Co worker safety	143.13	92.25	152.50	75.38	124.02	56.160,<0.001
Supervisor safety	150.92	63.89	156.82	127.62	114.04	79.742,<0.001
Management safety	125.26	114.99	136.91	124.72	113.33	5.093,0.278
Policies and programs	124.14	107.19	129.50	124.68	125.12	14.326,0.006

From table 4.7 it was observed that knowledge was a very significant predictor of adherence to protocols ($p<0.001$). At a p-value of 0.276 Job safety was not a good predictor of adherence to protocols, meaning thinking of your job as unsafe does not translate into adhering to protocols. Co worker safety, supervisor safety and safety programs and policies are good predictors of adherence to protocols.

Adherence to safety protocols was the dependent variable and from the table there is a worker is 5.3 times more likely to adhere to protocols if he or she is knowledgeable, than if he or she was not knowledgeable.

Table 4.7 Factors Predicting Adherence To safety Protocols.

INDEPENDENT FACTORS	ODDS RATIO	95% CI	P-VALUE
KNOWLEDGE[†]			
Not knowledgeable	Ref		
knowledgeable	5.316	3.050-9.265	P<0.001
JOB SAFETY			
No job safety	Ref		
Job safety	0.747	0.442-1.263	P=0.276
CO-WORKER SAFETY			
No co-worker safety	Ref		
Co worker safety	2.746	1.449-5.202	P=0.002
SUPERVISOR SAFETY			
No supervisor safety	Ref		
Supervisor safety	6.713	3.644-12.369	P<0.001
SAFETY POLICIES			
No safety policies and programs	Ref		
Safety policies and programs	6.048	1.351-27.073	P=0.019

Using stata version 11 to run multiple logistic regression of the independent variables against the dependent variable and adjusting for the various factors, the extent to which each factor affects adherence to protocols was obtained. (Appendice 3)

[†] Knowledge is scored as being high if cumulative score for the set of questions addressing knowledge is > 70%

CHAPTER FIVE

5.0 DISCUSSION

From the results of this study adherence to safety protocols in factories is influenced by a number of factors. The most significant factors found to be associated with adherence to protocols were certain socio demographic factors such as age gender and educational level. Knowledge and safety climate also had significant associations with adherence to safety protocols. Knowledge and safety climate were also good predictors of adherence to safety protocols.

5.1 Sociodemographic factors influencing adherence to protocols

In this study more males (67.3%) participated than females (30.7%) in all the factories. High male participation could be attributed to the male domination of the industrial workforce. Factory work is usually considered a masculine turf.

It was found out that males were 2.605 times less likely to adhere to protocols than females. This is consistent with the study by Aderaw et al (2011), which asserts that men are about 2.5 times more likely to sustain injuries at work due to their tendency to engage in risky behaviour such as ignoring safety rules.

This study found an association between age and adherence to protocols, and the older age groups had higher levels of adhering to the safety protocols than the younger age group. This affirms the studies by Bhattacherjee et al (2003), which concluded that workers below 30years old were about 1.9 times more likely to have occupational injuries than their older counterparts. Less experience, low level of skills and low knowledge of the work have known to be some of the causes. The level of experience and skill of the workers will also influence the safety climate of the factory since younger workers usually have less knowledge and skills. Higher numbers of younger

people not adhering to safety rules could also be because there were a lot more workers in the younger age group(45%) thus increasing the likelihood that the number of non adherent workers will be in that group.

Thirty –nine (39%) of the respondents had educational level below the HND level. Of these 39%, 16.2% were certificate level holders and 23.7% were diploma holders. There was no statistically significant difference between the two groups when it comes to adherence to protocols. Those with higher education (HND) were 3.57 times more likely to adhere to safety protocols and those with degrees were about 2.813 times more likely to adhere to safety protocols than those with certificates. This affirms the study by Gyekye et al (2009) which found an association between educational level and safety behaviour with the higher educated workers being more complaint with safety procedures.

Compared to the operations staff, Supervisors were 0.419 times less likely to adhere to protocols than the operations staff. This could possibly be because supervisors are usually not being supervised by anyone so can get complacent and not adhere to the protocols.

There was no statistically significant difference between managers and operators when it came to adherence to protocols.

This could be because the exposure level of a manager to any given risk is low and their perception of danger will be reduced, so they are not seen to be stringently following rules like wearing helmets and safety boots at all times.

5.2 Knowledge and Adherence to safety protocols

The goal of the study was to determine the factors that influence adherence to safety protocols by Ghanaian factory workers. Unilever Ghana limited was set as the standard. Consistent with the available National Laws (Labour Law and Factories, Offices and Shops Act), and provisions by the ILO, Unilever appears to be adhering to safety protocols as shown in the results obtained from the study. This study has affirmed that knowledge of the protocols in the factory has a positive predictive effect on adherence to protocol. This is consistent with the study by Jawaid et al (2009) and by Christian et al (2009) which concluded that improving knowledge of workers on safety protocols and safety knowledge are most strongly associated with performance behaviours such as adherence to protocols.

5.3 Safety climate as a factor influencing adherence to protocols

Safety climate (Job safety, co-worker safety, supervisor safety and presence of safety policies) is also a very strong predictor of adherence to protocols as shown by this study. This is consistent with the study by Neal et al (2004) and Gyekye (2006) asserting that positive perceptions about safety climates in the work place improve compliance to safety protocols. Despite this observation, it is interesting to note that management safety which is a component of the safety climate does not seem to have a very strong effect as compared to supervisor safety climate. This may be explained by the fact that the supervisors are in direct contact with the workers thus are able to exert more influence on the workers and relate to them better in order to get them to comply with protocols. Also job safety is high in companies with lower adherence scores like company C. This could be explained by the fact that the workers may perceive their work as being dangerous due to the unavailability of items or protocols that will help them keep safe. This Gyekye et al (2007) affirmed in their study to

investigate the relationship between safety climate and perceived organizational support, in which workers with lower perceived organizational support and safety climate had a higher perception of danger relating to their jobs. However job safety as a factor is not a predictor of adherence to safety protocols.

As reported by Gershon et al.(2000), the study found out that the presence of safety policies and programs had a positive predictive effect on adherence to protocols in Unilever

The study found that Unilever has the highest adherence levels compared with the other companies because it provides the requisite personal protective equipments for each job prescribed and also provides the necessary machinery for the various jobs. There were also very clear and visible warning signs and step by step procedural out lines on every process that the worker is to undertake. This is illustrated by the higher mean rank values of the supervisor safety, management safety and safety policies components of the safety climate when compared to the other factories.

The company also provides regular safety training for the workers and had instituted a weekly training drill where safety issues of pertinence are addressed both practically and theoretically. These trainings impart knowledge which in turn makes the safety climate a more positive one, with workers having a more positive perception of the organizations safety intentions. This was lacking in the other institutions and could explain why Unilever seemed to be recording more positive adherence patterns. The above positive safety climates and their effect on adherence to protocols is consistent with the conclusions drawn by Eliseo et al. (2011) that there is a positive association between safety climate and adherence to safety protocols.

5.4 Results and conceptual framework

The results of this study respond to the conceptual framework in many ways. The factors under consideration had an influence on adherence to protocols. Certain socio demographic factors predisposed a worker to adhering to safety protocols. Examples are the female gender, age and educational level. These socio demographic factors also tend to shape the perception of the workers thus affecting the safety climate of the company. Knowledge also influences adherence to safety protocols as shown by the study and in conformity with the conceptual framework. Knowledge tends to also shape perceptions. Safety climate also influences knowledge since a good safety climate promotes knowledge. Thus the results of the study relates well with the conceptual framework.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.I Conclusions

The study was to find out what factors influence adherence to safety protocols with Unilever Ghana Limited set as a standard. This study is of public health importance because when workers adhere to safety protocols they are less likely to be injured on the job. They are also less likely to contract and spread illnesses. This is especially important in the food production companies like the ones the study took place in, since any mishap impacts directly on the general public.

Although the study confirmed that there were safety protocols in all the factories, the differences in the adherence levels gotten in the studies stems from the different knowledge levels and safety climates in the various companies as shown by the study.

Better knowledge and understanding of the protocols improved compliance. High awareness and knowledge levels seem to be the key distinguishing factor when it comes to adherence to safety protocols between the various companies.

The safety climate in the various factories also had an influence on adherence to protocols, with high safety climate being a good predictor of adherence to protocols.

Marital status had no influence on adherence to protocols

6.2 Recommendations

The following recommendations are being made to improve adherence to safety policies:

Administration and management of the various factories

- The management of the various factories should improve upon the frequency of safety training and assessment of workers to ensure that they have knowledge and understanding of the existing safety protocols.
- The prerequisite educational level for employment into factories should be scaled up to help improve the intelligence and perceptiveness base of factory workers, especially those in the food production companies.

Government

- The Factories Inspectorate Division should be empowered and given the logistical support so that they are better able to play a watch dog role over the various factories to make sure rules are being adhered to.

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APPENDICES

Appendix 1: Informed consent form

Informed consent form

Project Title:

Factors influencing adherence to safety protocols by Ghanaian industries: A case study of Unilever Ghana Limited.

Institutional affiliation

School of Public Health, College of Health Sciences, University of Ghana , Legon.

Background

(Greet), My name is Mavis Adjoa Opong –Addoh. I am a student from the School of Public. I am conducting a research on the factors influencing adherence to safety protocols by Ghanaian industries; A case study of Unilever Ghana Limited. This is purely an academic work for a Master of Public Health

Procedure

Information to be collected includes background data, knowledge of existing protocols and the influence of Sociodemographic characteristics, knowledge of protocols and safety climate on adherence to safety protocols among others.

Risks and benefits

There will be no risk in answering my questionnaires since every step has been taken to ensure anonymity and confidentiality. The study will benefit you and the general

public by providing insight to what makes workers adhere to protocols and provide a basis for improving safety in our industries.

Right to refuse

Your consent to participate is voluntary and you are under no obligation to participate in the study. You are at liberty to withdraw from this study at any time. You are also free to ask questions. However, I will be grateful if you can complete it.

Consent

I .....having understood the reasons and implications of the study, willingly consent to taking part in the study.

Signature .....

Interviewer statement

I .....(the undersigned), have given to the subject all the necessary information pertaining to the study. The subject has agreed to take part in the study.

Signature of interviewer.....

Date .....

Appendix 2

FIELD QUESTIONNAIRE

Date No:

Section A – Socio-Demographic Factors

NO.	VARIABLES	RESPONSE	CODES
1	Age (at last birthday)	18-30 [ ] 31-40 [ ] 41-50 [ ] 51-60 [ ]	
2	Gender	Male [ ] Female [ ]	
3	Marital status	Never married/single [ ] Married [ ] Separated/divorced [ ] Widowed [ ] Other [ ]	
4	Education level	Certificate [ ] Diploma [ ] HND [ ] First degree [ ]	
5	Rank/ job title	Operation [ ] Supervisor [ ] Manager [ ]	
6	Number of safety incidents since Starting work	<3 [ ] 4-6 [ ] >6 [ ]	
7a	How many years have you worked here	1-5 years [ ] 5-10years [ ] 10-15 years [ ] 15-20years [ ] >20years [ ]	
7	Do you know of any safety protocols/policies in your factory		

Section B-Adherence To Safety Protocols

Using the scale below, please answer the following questions

Strongly Disagree	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly Agree**
1	2	3	4	5

NO	**VARIABLE**	**RESPONSE CODE**
1	The rules do not always describe the best way of working	1 2 3 4 5
2	Schedules hardly allow enough time to do the job according to the rules	**1 2 3 4 5**
3	Some rules make the job less efficient	**1 2 3 4 5**
4	I sometimes do not get the equipments needed to work to the rules	**1 2 3 4 5**
5	I sometimes do not know why i have to follow the rules	**1 2 3 4 5**
6	Some rules do not need to be followed to get the job done safely	**1 2 3 4 5**
7	Short cuts are acceptable when they involve little or no risks	**1 2 3 4 5**
8	My work is dangerous	**1 2 3 4 5**
9	My superiors enforce safety rules	**1 2 3 4 5**
10	My superiors conduct frequent safety inspections	**1 2 3 4 5**

Section C: Knowledge of Protocols

Strongly Disagree	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly Agree**
1	2	3	4	5

11	Some rules are extremely difficult to apply	1 2 3 4 5
12	It is necessary to bend some rules to achieve a target	**1 2 3 4 5**
13	The rules are not written in simple language	**1 2 3 4 5**
14	Some rules are factually incorrect	**1 2 3 4 5**
15	Sometimes the operating limits prescribed in the rules are very restrictive	**1 2 3 4 5**
16	I often encounter situations where no prescribed actions are available	**1 2 3 4 5**
17	There no general guidelines to work when specific rules do not apply	**1 2 3 4 5**
18	Some rules are only for in experienced workers	**1 2 3 4 5**
19	Some rules are of value only to protect the manager's back	**1 2 3 4 5**
20	No system exists to check people understand procedures before they are used	**1 2 3 4 5**
21	Deviations from the rules are not always corrected by the supervisor	**1 2 3 4 5**

22	There are circumstances where managers will support rules being broken	**1 2 3 4 5**
23	The natural reaction to some rules is to break them	**1 2 3 4 5**
24	Contractors are allowed different safety standards	**1 2 3 4 5**
25	I sometimes have difficulty getting hold of written rules and procedures	**1 2 3 4 5**
26	I sometimes come across a rule i did not know about	**1 2 3 4 5**

JOB SAFETY

27	My work is risky	**1 2 3 4 5**
28	My work is safe	**1 2 3 4 5**
29	My work is unhealthy	**1 2 3 4 5**

CO-WORKER SAFETY

30	My co workers ignore safety rules	**1 2 3 4 5**
31	My co workers don't care about other's safety	**1 2 3 4 5**
32	My co workers pay attention to safety rules	**1 2 3 4 5**
33	My co workers look out for other's safety	**1 2 3 4 5**
34	My co workers keep the workplace clean	**1 2 3 4 5**

SUPERVISOR SAFETY

35	My immediate supervisor praises safe work behaviour	**1 2 3 4 5**
36	My immediate supervisor encourages safe behaviour	**1 2 3 4 5**
37	My immediate supervisor keeps workers informed on safety rules	**1 2 3 4 5**
38	My immediate supervisor rewards safe behaviour	**1 2 3 4 5**
39	My immediate supervisor involves workers in setting safety goals	**1 2 3 4 5**
40	My immediate supervisor discusses safety issues with others	**1 2 3 4 5**
41	My immediate supervisor updates safety rules	**1 2 3 4 5**
42	My immediate supervisor trains workers to be safe	**1 2 3 4 5**
43	My immediate supervisor enforces safety rules	**1 2 3 4 5**
44	My immediate supervisor acts on safety suggestions	**1 2 3 4 5**

Strongly Disagree	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly Agree**
1	2	3	4	5

MANAGEMENT SAFETY PRACTICES

45	Management provides enough safety training programs	**1 2 3 4 5**
46	Management provides safe working conditions	**1 2 3 4 5**
47	Management conducts frequent safety inspection	**1 2 3 4 5**
48	Management investigates safety problems quickly	**1 2 3 4 5**
49	Management helps maintain clean work	**1 2 3 4 5**

SAFETY POLICIES(PROGRAMS)

50	The safety policy is worthwhile	**1 2 3 4 5**

51	The safety policy Helps prevent accidents	**1 2 3 4 5**
52	The safety policy is Unclear	**1 2 3 4 5**
53	The safety policy is important	**1 2 3 4 5**

Appendix 3: logistic regression to show the strength of prediction of independent factors to adherence to protocols according to factories

INDEPENDENT FACTOR	ADJUSTED ODDS RATIO	(CI 95%)	P VALUE
Knowledge	3.2	1.66,-6.448	P<0.001
Unilever	Ref		
Company A	0.048(0.016,0.138)		<0.001
Company B	0.325(0.116,1.063)		0.064
Company C	0.471(0.175,1.257)		0.136
Company D	0.109(0.046,0.260)		<0.001
Job Safety	1.158(0.603, 2.220)		0.658
Unilever	Ref		
Company A	0.035(0.013,0.100)		<0.001
Company B	0.40(0.136,1.171)		0.095
Company C	0.260(0.102,0.663)		0.005
Company D	0.077(0.033,0.0170)		<0.001
Co worker safety	1.236(0.525, 2.901)		0.627
Unilever	Ref		
Company A	0.038(0.0129,0.113)		<0.001
Company B	0.380(0.130,1.102)		0.075
Company C	0.303(0.107,0.854)		0.024
Company D	0.079(0.034,0.182)		0.079
Supervisor safety	2.875(1.365, 6.05)		0.005
Unilever	Ref		
Company A	0.069(0.022, 0.213)		<0.001
Company B	0.353(0.119,1.043)		0.06
Company C	0.313(0.121,0.808)		0.6016
Company D	0.093(0.04,0.22)		<0.001
Safety policies and programs	5.09(0.92, 28.21)		0.063
Unilever	Ref		
Company A	0.04(0.013,0.108)		<0.001
Company B	0.35(0.12,1.03)		0.057
Company C	0.26(0.102,0.659)		0.005
Company D	0.072(0.031,0.167)		<0.001