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INCIDENCE OF OCCUPATIONAL HEALTH HAZARDS AND SAFETY CULTURE AT TEMA OIL REFINERY (TOR) IN GHANA: EXPLORING THE SYMBIOTIC RELATIONSHIP

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ABSTRACT: *This study examined a symbiotic relationship between Occupational health hazards and safety culture at Tema oil refinery in Ghana. The study employed both exploratory and descriptive research designs. Convenient sampling technique and structured questionnaires were deployed to elicit information from 186 participants. The data were analysed using Statistical Package for Social Sciences (SPSS). The study discovered that employees are continuously been exposed to chemical substances - the incessant exposure to hazardous chemical poses health complications like respiratory diseases, reproductive disorders, cardiovascular diseases, renal diseases and others. Furthermore the study revealed that protective wears and equipment are inadequate resulting in the inhalation of hazardous chemicals and sometimes spill over their skin. Moreover, the study found that there are lapses and weak ergonomic arrangements in the Tema Oil Refinery (TOR). The study found that job description at TOR is very challenging, tedious and time consuming. In addition the study revealed that although TOR offers pre-employment training before employees are employed, the company lacks continuous policy on training where employees are periodically trained to equip them on health and safety practices. Surprisingly, TOR is less proactive about the health of employees because they lack policies that ensure occasional check-ups for health issues. In conclusion, the causes of accidents were identified as poor working conditions, human errors and the lack of protective clothing. The study recommends that there is the urgent need to integrate policies and models to effectively manage safety culture at TOR. Furthermore, the study recommends that integrated model is required to comprehensively explain the safety culture at TOR since implementation of occupational health and safety management system (OHS-MS) has been proven inadequate.*

KEYWORDS: Ghana, Health Hazards, Oil and Gas, Safety Culture, Tema Oil Refinery

INTRODUCTION

According to the World Health Organisation (WHO), a substantial part of the general morbidity of the population is related to work. This assertion, though frightening, is not surprising as workers represent half of the global population and contribute greatly to the economic and social value of contemporary society. Indeed, people spend a significant portion of their lives at work with their jobs often bringing meaning and structure to their lives. Because work is a central part of many people's lives, it generally is recognised that individuals should have a safe and healthy working environment (WHO, 2007; Annan *et al.*, 2015; Asumeng *et al.*, 2015).

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According to the WHO Health for All principles and ILO Conventions on Occupational Safety and Health (No. 155) and on Occupational Health Services (No. 161) every worker has the right of access to occupational health and safety services, irrespective of the sector of the economy, size of the company, or type of assignment and occupation. The Rio Declaration on environment and development (1992) also states that ―human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature. Clearly the ability to enjoy a safe and healthy working environment is an important part of a sustainable future. To date, occupational health has not attained a high profile in the sustainable development agenda particularly in developing countries where most people are engaged in primary industries such as agriculture, logging and mining.

Adei & Kunfaa (2007) assessed the perceived occupational health hazards exposure and the effectiveness of the policies put in place to ensure the health and safety of workers and reported that the lack of commitment by management to implement OSH policy where it existed, consideration of payment of insurance premium as sufficient protection for their workers, restrictive inspections, education and enforcement by under resourced DFI (which shows extent of government commitment to OSH) and Timber and Wood Workers union inability to project OSH agenda have contributed substantially to neglect of workers health and safety. Adei & Kunfaa (ibid) further asserted that there is also the need for enforcement of health and safety regulations and policies. One of the most common techniques used to reduce at-risk behaviour within the workplace is to introduce stricter rules, increase supervision of the target behaviour or increase the number of reprimands given out for failure to comply with the companies' policy and procedures.

Similarly, in Kenya, Gaceri (2015) evaluated the factors affecting the implementation of health and safety measures in the supermarkets found in Kenya. Supermarkets in Kenya have made it a habit to hold safety meetings every morning before works start. This means management shows positive attitude towards safety activity. Guidance is one vital variable that is needed to implement health and safety measures in supermarkets hence the formulation of policies safeguard accidents. The implementation of health and safety needs honesty and integrity with much flexibility and acceptance when providing guidance for employees. Leadership at the supermarket is very high because leadership is the cause of safety rules implementation. Leaders at supermarkets do massive consultation among departmental heads in the implementation of safety measures. Involving employees in the implementation of health and safety facilitate processes. The use of participatory approach, improves health and safety through the sharing of information with employees and by also creating individualized partnership with workers to deliberate on health and safety issues. The supermarkets selected for the study constantly take their employees through training for a minimum of three days and a maximum of one month. Training influences the implementation of health and safety whereas the lack of it affects performance and productivity of the organization.

EMPIRICAL REVIEW

The indispensible nature of occupational health and safety makes it important to use indicators in measuring against other companies to know how companies are performing. The most prioritized indicator used in organizations is compliance requirements. Also, the number of accidents recorded at the workplace was noted, working in an exposed hazardous condition which is used by more than 70% of the companies researched. It is important that indicators

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are line with the requirements of law which may contribute to national data and useful for insurance (Pawlowska, 2015). Another indicator that was identified was the number of employees involved in health and safety courses which is linked directly to compliance.

Although the indicators does not directly relate to compliance as stated in law, their bases are tied to occupational health and safety that is managed to achieve stable OHS. Companies mostly adopt measures to comply with standards that have been set by law and the company itself. Monitoring of indicators helps to evaluate performance which ensures that responses are gathered and changes made when the need arises. Some companies may have indicators but may not monitor whether the indicators are being met. The number of accidents at the workplace is always monitored and this account for over 80% of companies which uses the number of death indicator. About 20% of the organizations use training on safety indicator as a means of measuring OHS practices. Process safety indicators are the indicators that are selected to measure performance while companies implement safety rules and policies (Tomlinson *et al.,* 2011)

Companies either consider their process safety indicators as leading or lagging but according to Hopkins (2007), these two terms are similar but there are others that use it to explain two different concepts. Achieving enviable results through monitoring safety performance indicators plays a pivotal role in safety performance. Safety performance is a culture that is developed through conscious effort over time. Tomlinson *et al.* (2011) through this developed a model that can be employed by mariners to contribute significantly to safety practices in cargo-carrying as a commercial activity. It was proposed that incentives should be instituted into the safety process indicators to which will promote compliance among departments within the company. Management support is integral in the advancement of health and safety practices in an organization. Deploying stringent requirement and guidelines towards OHS contributes to continuous planning and monitoring to improve OHS practices. Evidence shows that companies that have record less accident have multiple risk prevention indicators that aid in their splendid performance.

Communication and occupational health and safety training is regarded as the two main variables that have positive influence on company's compliance with OSH legislation. Effective occupational health and safety training coupled with communication have a significant 76.1% influence on compliance and there are other factors that also influences compliance aside communication and OSH training. However, training contributes significantly to compliance compared to communication. The most dominant accident that occurs at construction sites are falling from heights and this can be dealt with by raising awareness. Falling from height happens among employees of different ages, education and among people with no safety briefings. Combating the occurrence of accidents demands serious commitment from employees and most importantly, employers who need to ensure that the necessary safety processes are duly followed by their employees. Having regular and routine meeting before work commences is important to curb the incidence of accidents and hazards experienced at the workplace. The use of safety signage is also vital to ensure staff and visitors safety by preventing them from approaching places that have been dubbed danger zones (Nawi *et al.,* 2016; Wambilianga and Waiganjo, 2013).

However, the trainings are known to be insufficient considering the duration of the training period. Hence the need to increase the resource base aimed to enhance health and safety measures at supermarkets. Among the supermarkets selected for examination, some involved their stakeholders while others do not involve stakeholders in the implementation of health and

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safety measures. The implementations of health and safety have reduced accident by 70% in major supermarkets. Employees desire to have some policies measures on health and safety policies in order to implement them. Equipments like fire extinguishers were identified at vantage locations to avert possible fire outbreaks. In a study, Zin and Ismail (2011) found that compliance in terms of safety includes commitment from management which is followed by organizational commitment, effective safety training programmes, safety communication, safety motivation, safety rules and regulations, safety leadership safety management systems, safety and health officers and protection of personnel by supplying them with the necessary gadgets. Employers' behaviours contribute immensely to encouraging employees' behaviour in relation to occupational health and safety compliance in their industry.

Arewa and Farrell (2012) reviewed literature on HSE using information from 2007-2011. The knowledge bases of small businesses on health and safety programs are very less. They simply don't understand the need to invest in safety and health practices. Small and medium enterprises do not regard health and safety measures as a formal compliance initiative. There is the need for the government to set up bodies to check for companies that violate health and safety practices. In this respect, specific advice and guidance are needed to create awareness among SMEs to understand the importance of investing in safety, setting performance targets and assessing the commitment of the company regularly to check their level of compliance to health and safety regulation and rules (Annan *et al.,* 2015; Asumeng *et al.,* 2015)

Money that has been spent on safety management practices coupled with capital that have been invested in simile sensitive projects that advances the course of quality practices is considered money well invested and this reflects on the profitability of the company. Returns on investment are mostly intangible and difficult to measure especially where the cash flow system of the SME is not structured. Nee *et al.* (2011) discussed the current situation of health and safety practices in the logistics industry. The discussion was tied around OHS regulations, Notification of Accidents, Dangerous Occurrence, Occupational Poisoning and Occupational disease (NADOOPOD) which were enacted in 2004. Since 2004, no other regulations have been designed to deal with health and safety systems in small companies. The key factor that was considered was the safety of the aged and other health and welfare regulations. The transportation sector has been one of the sectors that received attention on health and safety as well as ways of protecting the natural vegetation in Malaysia. The formulation of new regulations on Global Harmonized System to control hazardous substance as well as the transportation of goods and metabolic syndromes was strengthened to promote safety on roads.

Indicators must be evaluated for effectiveness as far as occupational health and safety is concerned. The adequate protections for employees have become difficult and have evolved into a national issue. This demands participatory efforts from both employers and workers. Upgrading legal requirements enhances safety and health practices. In cases where there are training sections organized for employees, its leads to participatory efforts. Organizing medical check-ups and free screening helps in early detection of health complications and facilitate the effective treatment dynamic and complex health conditions. Safety management is complex and dynamic and requires extensive attention from the aspect of humans, budgeting and technical variables. In every system, there are factors that promote the successful operationalization and implementation of safety policies and initiatives. Studies (Annan *et al.,* 2015; Asumeng *et al.,* 2015) on organizational psychology have been adopted to test the acceptance of technology. Safety climate have also been studied in varied settings with few studies conducted in the field of logistics and manufacturing sector. The Decomposed Theory

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of Planned Behaviour (DTPB) has been experimented by looking at the challenges, injuries and fatalities in the logistics sector. The theory discovered some subjective norms, motivations and perceived behaviours which contribute to safety behaviour.

In Nairobi, Kenya, Mputhia *et al.* (2012) examined the awareness of environmental regulations in determining compliance among micro and small businesses in the manufacturing sector of Kenya. Awareness about the Environmental Management and Coordination Act (EMCA) was significant among micro, small and medium enterprises. Awareness was in varied degree among groups like leather workers, footwear, tobacco and beverage products and rubbers and plastics. It was found that some of the SMEs were aware of environmental regulations but small business hat were not aware as well as those that were unable to comply with the environmental regulations are destructive to the environment. NEMA has not yet fully covered manufacturing companies in the chemical and allied sector. Inadequacies were discovered in the sharing of information on regulations of the environment in order to perform environmental roles adequately. This indicates that institutions have a role to play in dissemination of environmental regulatory procedures. This means that institutions that disseminate environmental regulation information needs to be adequately resourced to carry out their activities.

Idirimanna and Jayawardena (2011) conducted a study to analyze factors that affect health and safety behaviours of fruit and vegetable processors in ensuring occupational health and safety. Again, Idirimanna and Jayawardena (2011) reiterated that occupational health and safety is a joint initiative between employees and employers. The interest of both parties differ but they jointly leads to successful and a more concrete health and safety practices among companies. It must be agreed that several challenges are faced by employees and employers in the implementation of health and safety practices. The concerns from both parties are mostly sourced from the workplace health and safety, the focus of the stuffs, the focus of the company and the reactions of employees towards their safety, job description and requirements and among others. There are three levels of staffs; the supervisory and clerical staffs, the industrial staffs and executive staffs and the influence of the executive staff means a lot in safety and health practices. There are varied safety measures in the working environment and that is, works that require longer hours of work eventually reduces employee contribution to ensuring health and safety practices. Ergonomic hazards are the most recurring hazards in manufacturing companies. The automation of works has ripped off the use of manual works which makes postures awkward at the workplace.

Supervisors however have moderate influence and co-workers have less influence over their colleagues. The behaviours of industrial staffs depend on many factors and among those that highly influence employees are executives and the management of the company. The stress levels of employees, working sections, previous incidents, personal attitude towards health and safety are known to be imperative for safety practices. Factors like the education of employees, working experience, age, marital status and gender and among others does not have much influence health and safety. The attention of employees at work very minimal and this account for most health and safety issues at the workplace. Companies that are into construction must implement health and safety practices and the responsibility must be a shared responsibility between employees and employers. The most ideal way to plan health and safety in developing companies is by incorporating the two most important stakeholders which are the employees and the employers. Stress was noted to have evolved from huge workloads, less opportunity to improve career and uncomfortable working environment. The repetitive nature of incidents

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jeopardizes the behaviour of employees which contributes negatively to safety issues (Annan *et al.,* 2015; Asumeng *et al.,* 2015)

In Nigeria, Umeokafor *et al.* (2014) assessed compliance with occupational health and safety regulatory entity. Most companies faulters in compliance with health and safety regulations in Nigeria. In an interview, it was revealed that employees are mostly not given personal protective equipment (PPE) which are tools used to minimize the extent of injuries in case accidents should occur. Also, screens that are used to display safety practices by displaying how PPE are used were inadequate hence have failed to convey safety messages at the workplace. This is in direct violation of the Factory Act F1 LFN 2004 in Nigeria. Employees have the right to report any violations at the workplace to the director in charge according to the Factory Act 2004. It therefore becomes the obligation of the director to handle and manage the situation at the workplace to prevent any casualties. Hammer *et al.* (2016) examined the effect of work-family interventions in relation to the compliance to safety and organizational behaviour. The combination of family or allowing the influence of family contribution in the management of workplace activities brings harmony in issues like wages and working hours.

In South Africa, Windapo (2010) investigated the level of contractors' compliance to health and safety legislations. The study proposed measures that can be adopted by companies in the construction industry to ensure effective compliance to health and safety practices at the workplace. The question of compliance or non-compliance to health and safety management practices as stated by legislation is influenced by two main factors; the site where the construction is going on and the attitude of the site manager. In a series of meticulous data collected at the Western Cape Province of South Africa found a direct effect of the building sites and site manager's attitude on compliance to health and safety legislation. Compliance is also dependent on the knowledge of the site manager with regards to health and safety legislation compliance and how the site manager is committed to complying with these safety practices. Recommendations have been made that site managers should be committed to safety legislations due to the involvement of human lives couple with the fact that, reducing injuries, accidents and levels of fatalities increases work output through the elimination of absenteeism in inculcates the sense of pride into employees. This happens when employees belief the company care about their welfare hence deepening the cords of employee loyalty.

In Kenya, Wazir (2013) explored the challenges confronted by the Kenyan Airways in the implementation of health and safety systems. The Kenyan Airline industry has a concrete evidence of written formal policy on health and safety which are used as a guiding principle in their industry. Irrespective of the colourfully drafted documents on health and safety, employees have been graced with ignorance of these policies and a major contributing factor to this is the focus of safety managers to flight other than incorporating other compartments within the aviation industry. This hampers the collective effort to control, manage and combat the occurrence of accidents, injuries and casualties. To make conditions worse, there are no training programmes scheduled to equip employees.

Nonetheless, orientations are done to create the awareness to health and safety but the effect it has on improving health and safety is negligible. Cognizance is not given to health and safety unless an accident occurs. Employees and unit heads have less involvement in identifying risks and hazards. Passivity was the activeness of line managers in health and safety planning and execution but everything concerning health and safety are left in the hands of the health and safety manager who plans everything without consulting line managers who are on the field and know the challenges and complexities of the undertaken. Employees show much concern

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when there are no structured measures to deal with the physical and mental wellbeing of workers. Wazir (2013) discovered that there were medical and health relief packages that were offered to employees in cases of accidents and other calamities. It was further found that protective clothes are given to employees but they scarcely use them. This exposes workers to risks and dangers and other hazards.

In a related work, Salihu *et al.* (2016) explored the factors affecting facilities compliance to the regulations of the environment. As part of the study, the knowledge and understanding of environmental legislations compliance were considered. There were myriad of challenges that were noted to have been affecting compliance to environmental regulations and this includes; the relationship between operators and regulatory agencies. Another factor that hinders compliance is basically the lack of awareness on regulations that binds the operational activities a company. There is also the lack of technical skills and expertise that contributes to non-compliance. Healthcare in relation to health and safety is an anchor that encourages quality work performance. Attention was given to safety climate, work related illnesses and injuries (e.g, musculoskeletal disorders and cut injuries), stress and burnouts and factors that enhances employee performance such as staffing ratio, quality improvement process and teamwork (Lundstrom *et al.*, 2002).

Jambwa and Chitongo (2013) carried out a study to investigate the extent of OHS among workers at the water and sewage, Morondera Municipality. The study found that the municipality has performed abysmally in protecting their workers against accidents and diseases. It is of no surprise that the spread of infections and accidents were on the ascendency. Employees have less protective guides because they lack inspection from health and safety officers. In the light of this, Jambwa and Chitongo (2013) concluded that negligence and the habit of familiarity have caused more accidents and injuries than natural cause of accidents. The old employees demonstrate more act of negligence compared to new employees. Occupational health and safety have been given less audience in the Morondera Municipality. In addition to that, employees are excluded from deliberating on the occupational health and safety issues. When employees show their displeasure, management sees the employees as troublesome. Labour inspectors have scarcely visited the facility since time immemorial. Hence, there is the need to ensure that the ministry under the local government in charge of labor laws must be active and vibrant in carrying out their duties. In short, the causes of accidents were grouped into poor working conditions, human errors and the lack of protective clothing.

METHODOLOGY

***Research Design, Population, Sampling and Sample Size*:** The positivist's assumption was adopted for the study. This means a quantitative design was used specifically; a descriptive design was adopted for the study. Responses were gathered from the perspective of management and employees' of TOR on safety culture. Respondents that constituted the study population included fulltime workers, contract workers and casual workers. The estimated sample size for the study was 350 based on Cooper and Schindler (2006) tables with 95% confidence interval. About 186 questionnaires were returned, denoting 53.1% response rate.

Data Collection Instrument: Both primary and secondary sources of data were used. With the help of structured questionnaires, convenient sampling approach was employed to elicit for data

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from 186 respondents. The instruments used for the study were adopted and modified from Osabutey (2013). In all, there were 23 questions on operational risks, safety policy and safety procedures for employees and management of TOR. The instruments were measured using 5-point Likert Scale (where 5=critical and 1=very low). Secondary data was deduced from scientific database like Impact factor, Ulrich, Cite Seerx, BASE and Index Copernicus and among others.

Data Analysis: Statistical Package For Social Sciences (SPSS) Version 23 was used to analyse the data gathered from the field. The data was validated to ensure there were no wrong entries, omissions, non-response, double entry and among other to enhance the reliability, the completeness, validity and consistency of the data. As a result of the objectives, both descriptive and inferential statistics were deployed. Specifically, the study used percentages, means and standard deviations.

Ethical Consideration: ethical issues were adhered to due to the nature of the study where corporate image is involved. The right of respondents were duly respected and this was devoid of harm and integrity of professionals was accorded the needed recognition. Prior to soliciting of information from respondents, consent letter was sent to TOR to seek approval before the data was subsequently collected from both employees and management.

ANALYSES AND DISCUSSIONS

Socio-Demographic Characteristics

The table 1 presents results on demographic information about the respondent. From the survey, 29% of the respondents were between the ages of 32-40 years, 24.2% were 41-50 years and 46.8% were above 50 years. This implies that majority of the respondents are fully matured. Furthermore, the survey revealed that, 76.3% of the respondents were males and 23.7% were females. This implies that the number of male respondent is dominant over the female. Moving on, the study showed that, 14% of the respondents belonged to Islamic religion, 76.3% belonged to Christianity religion and 9.7% belonged to other religions. From the survey it's a fair judgment that about 80% of the respondents are Christians. Moreover, the research revealed that, 9.1% of the respondent had their educational level to be primary, 14.5% had a degree, 47.8% had their masters, 28.5% had other forms of educational background. This result is an indication that majority (47%) of the respondent have acquired a higher level of education and are highly intellectuals. Again, the study revealed that slightly below 82% were married and 9.1% were divorced. Lastly, 9.1% of the respondents were widows. This implies that, a reasonable number of the respondents are couples. Furtherance, the research showed that, 9% of the respondents had 5-9 years working experience, 19.4% had 10-114 years working experience and 71% had 15> working experience. This result is an indication that, 71% of the respondents have the most intensive knowledge of the work. In addition, the survey revealed that, 9.7% had a backup nature of employment, 67.2% had full time nature of employment, 9.1% had contractor nature of employment and 14% had casual nature of employment. This implies that most of the respondents have a full time profession. Also, the study revealed that, 86% of the respondents run shifts and 14% do no run shifts. The results points out that majority (86%) of the respondents move from one place to another and therefore are dominant over the 14% who do not run shifts.

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Table 1: Socio-Demographic Characteristics of Respondents (n=186)

Demographics	F	%
Age		
31-40	54	29.0
41-50	45	24.2
>50	87	46.8
Sex		
Male	142	76.3
Female	44	23.7
Religion		
Islam	26	14.0
Christianity	142	76.3
Others	18	9.7
Educational level		
Primary	17	9.1
Degree	27	14.5
Masters	89	47.8
Others	53	28.5
Marital status		
Married	152	81.7
Divorce	17	9.1
Widow/er	17	9.1
Years of working in TOR		
5-9	18	9.7
10-14	36	19.4
15>	132	71.0
Nature of employment		
Backup	18	9.7
Full Time	125	67.2
Contractor	17	9.1
Casual	26	14.0
Running of shift		
Yes	160	86.0
No	26	14.0

Source: Field Survey, 2016

Descriptive Statistics on Physical Health Hazards

Table 2 presented the results of physical health hazards at the work environment. The study revealed that a greater number of employees (M=3.47 & SD=0.79) agreed that noise is relatively high at their workplace, a larger proportion (M=3.61 & SD=0.47) agreed that they could loss their hearing due to the exposure to loud noise at the workplace, majority (M=1.33 & SD=0.47) disagreed that their job function deals with handling of tools, objects, equipment, machines, chemicals etc. that have high temperatures. Again, a greater proportion (M=1.63 & SD=0.69) strongly disagreed that extreme heat could cause body cramps, most of the respondents (M=2.89 & SD=0.87) disagreed that their workplace shakes owing to vibrations from machines and equipment, equally, a reasonable number (M=2.34 & SD=0.78) of workers

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disagreed that vibrations could cause disorders in their spines and cause fatigue. Similarly, a greater proportion (M=2.34 & SD=1.29) of workers disagreed they have adequate lighting system, however majority (M=2.19 & SD=0.79) disagreed that inadequate illumination could affect their eye sight and a greater portion (M=1.80 & SD=0.85) strongly disagreed that radiations from welding and radioactive substances could be emitted as they perform their job functions. Lastly, majority (M=2.09 and SD=0.81) of the employees disagreed that radiations could cause cancers and premature skin aging.

Table 2: Physical Health Hazards

Statements	Mean ± SD	Skewness	Kurtosis	Decision
The noise level in my workplace is relatively high	3.47 ± 0.79	-1.63	2.24	Agree
Loss of hearing could result from exposure to loud noise	3.61 ± 0.49	-0.47	-1.80	Agree
My job function has to do with working with object, tools, equipment, machine, chemical etc. that has high temperature	1.33 ± 0.47	0.71	-1.51	Strongly disagree
Extreme heat could cause body cramp	1.63 ± 0.73	0.69	-0.80	Strongly disagree
My workplace shakes as a result of vibration from workplace machines and equipment	2.89 ± 0.87	-0.69	0.03	Disagree
Vibration could disorder the spine and causes fatigue	2.34 ± 0.78	-0.69	-1.03	Disagree
My workplace is adequately lighted	2.34 ± 1.29	-0.67	-1.65	Disagree
Inadequate illumination could affect the eyes	2.19 ± 0.79	-0.29	-1.33	Disagree
Radiations like in welding, radioactive substances etc. could be emitted as I perform my job function	1.80 ± 0.85	-0.35	-1.51	Strongly disagree
Radiation could cause cancer and premature skin aging	2.09 ± 0.81	-0.18	-1.47	Disagree

Source: Field Survey, 2016. *SD=Standard Deviation*

Descriptive Statistics on Chemical Health Hazards

The Table 3 showed the outcome of chemical health hazards. The survey discovered that majority (M=1.87 & SD=0.87) of the employees strongly disagree that they work with chemical substances, another, (M=1.61 & SD=0.72) strongly disagreed that the substance they work with are solvents, mist, fume and gases and majority (M=2.45 & SD=1.14) of the workers disagreed that the substances they use involve dust particles, metals and metalloids. In furtherance, a large number (N=2.98, SD=0.88) of employees disagreed that the chemical/gases they use are flammable, poisonous and corrosive but a greater proportion (M=3.28 & SD=0.77) of the workers agreed that the hazardous chemicals are inhaled, injected, injected and sometimes spill over their skin. Similarly, majority (M=3.47 & SD=0.59) of the worker agreed that eating at a chemical contaminated area is highly prohibited with a larger

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number (M=3.43 & SD=0.66) agreed that chemical substances should be carefully handled and labelled and also, a reasonable number (M=3.62 & SD=0.49) agreed that chemical hazards are likely to affect their health when they are exposed for a long period of time. In addition, a greater majority (M=3.76 & SD=0.43) agreed that exposure to chemical hazards could cause reproductive disorders, cardiovascular diseases, respiratory diseases, renal diseases etc. and a greater portion (M=3.53 & SD=0.50) agreed that the health impact of hazards could lead to loss of human life.

Table 3: Chemical Health Hazards

Statements	Mean ± SD	Skewness	Kurtosis	Decision
Working with chemical substances is part of my job function	1.87 ± 0.87	0.26	-1.53	Strongly disagree
The substances are solvent, mist, fume and gases	1.61 ± 0.72	0.75	-0.73	Strongly disagree
The substances are dust, particles, metal and metalloid	2.45 ± 1.14	0.26	-1.37	Disagree
The chemical/gases are flammable, poisonous and corrosive	2.98 ± 0.88	-0.72	-0.03	Disagree
The hazardous chemicals are sometimes inhaled, ingested, injected and spill over my skin	3.28 ± 0.77	-1.18	1.56	Agree
Eating where there are chemical is highly prohibited	3.47 ± 0.59	-0.59	-0.58	Agree
Chemical substances should be carefully handled and labeled	3.43 ± 0.66	-1.08	1.49	Agree
Chemical hazards are likely to affect ones health when they are exposed to them for a long period of time	3.62 ± 0.49	-0.49	-1.78	Agree
Exposure to chemical hazards could cause reproductive disorder, cardiovascular disease, respiratory diseases, renal diseases etc.	3.76 ± 0.43	-1.22	-0.53	Agree
The health impact of chemical hazards could lead to loss of life	3.53 ± 0.50	-0.11	-2.01	Agree

Source: Field Survey, 2016. *SD=Standard Deviation*

Descriptive Statistics on Mechanical/Ergonomic Health Hazards

The Table 4 presents descriptive result on ergonomic health hazards. From the study, a large number of workers (M=3.47 & SD=0.74) agreed that they sometimes take awkward postures while working, minority (M=3.04 & SD=0.90) disagreed that they sometimes work in height, another large proportion (M=3.57 & SD= 0.49) of workers agreed that when performing their work functions they stand for long hours. More so, minority (M=1.33 & SD=0.47), strongly agreed that the work materials at their duty post is obsolete, majority (M=2.32 & SD=0.84) disagreed that they lift objects manually .the chair, desk, and other working tools and materials arrangements in their workplace is very comfortable and convenient with my function and

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minority (M=2.72 & SD=0.94) agreed that they sit most times when they are on duty. Moreover greater number (M=2.42 & SD=0.89) disagreed that their work is repetitive and monotonous, majority (M=2.66 & SD=1.13) also disagreed that ergonomic hazards could cause deformity of one's body and minority (M=2.24 & SD=0.87) agreed that mechanical/ergonomic hazards could cause back, neck and body pain.

Table 4: Mechanical/Ergonomic health hazards

Statements	Mean ± SD	Skewness	Kurtosis	Decision
I sometimes take a awkward posture while working	3.47 ± 0.74	-0.99	-0.46	Agree
I sometimes work in height	3.04 ± 0.90	-0.88	0.18	Agree
When performing my job functions I stand for a long while	3.57 ± 0.49	-0.29	-1.94	Agree
The work material at my duty post is obsolete	1.33 ± 0.47	0.71	-1.51	Strongly disagree
I lift heavy objects manually The chair, desk and other working tools and materials arrangements in my workplace is very comfortable and convenient with my job functions	2.32 ± 0.84	-0.17	-0.83	Disagree
I sit most time when I am on duty	2.72 ± 0.94	-0.11	-0.95	Disagree
My work is repetitive and monotonous	2.42 ± 0.89	-0.18	-0.83	Disagree
Ergonomic hazards could cause deformity of ones body	2.66 ± 1.13	-0.11	-1.40	Disagree
Mechanical/Ergonomic hazards could cause back, neck and body pain	2.24 ± 0.87	-0.03	-0.95	Disagree

Source: Field Survey, 2016. *SD=Standard Deviation*

Descriptive Statistics on Biological Health Hazards

Table 5 presented the results on biological health hazards. The survey unearthed that majority (M=2.62 & SD=1.09) disagreed that microbes could be found in some of the substances they work with. With regards to hazardous waste, many of the employees (M=2.38 & SD=0.91) disagreed that they generate hazardous waste while working and equally high number of employees (M=1.87 & SD=0.84) strongly disagreed that some of the hazardous waste could impact on their health. Regarding biological hazards, a greater proportion (M=1.61 & SD=0.72) strongly disagreed that biological hazards could cause Tuberculosis, pneumonitis, pneumoconiosis etc. and lastly, majority (M=2.01 & SD=0.76) of the employees disagreed that proper environmental hygiene is lacking in their workplace.

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Table 5: Biological Health Hazards

Statements	Mean ± SD	Skewness	Kurtosis	Decision
Microbes could be found in some substances I work with in my work station	2.62 ± 1.09	-0.08	-1.31	Disagree
I generate hazardous waste while working	2.38 ± 0.91	-0.02	-0.84	Disagree
Some of this hazardous waste could impact on the health of workers	1.87 ± 0.84	0.26	-1.53	Strongly disagree
Biological hazards could cause Tuberculosis, pneumonitis, pneumoconiosis etc.	1.61 ± 0.72	0.75	-0.73	Strongly disagree
Proper environmental hygiene is lacking in my place of work	2.01 ± 0.76	-0.02	-1.25	Disagree

Source: Field Survey, 2016. *SD=Standard Deviation*

Descriptive Statistics on Psychosocial Health Hazards

Table 6 presented the results on health hazards. The study found that majority (N=3.24 & SD=0.53) of employees agreed that they have a very challenging workload, a larger portion (M=3.57 & SD=0.59) of the workers agreed that they wants to be transferred to another unit or department, another greater proportion (M=3.61 & SD=0.49) agreed that they work in isolation while majority (M=3.48 & SD=0.50) agreed that they are constantly being talked down by their supervisors and a whopping proportion (M=3.58 & SD=0.49) agreed that they are faced with some form of aggression and harassment at the workplace. Lastly, majority (M=3.62 & SD=0.49) agreed that psychosocial hazards could cause hypertension, anxiety, boredom and etc.

Table 6: Psychosocial Health Hazards

Statements	Mean ± SD	Skewness	Kurtosis	Decision
My workload is very challenging	3.24 ± 0.53	0.17	-0.26	Agree
I would like to be transferred to another unit/department	3.57 ± 0.59	-1.00	0.03	Agree
I work in isolation	3.61 ± 0.49	-0.47	-1.80	Agree
I am constantly talked down by my Superior	3.48 ± 0.50	0.09	-2.01	Agree
I am faced with some kind of aggression and harassment in my place of work	3.58 ± 0.49	-0.31	-1.93	Agree
Psychosocial hazard could cause hypertension, anxiety, boredom etc.	3.62 ± 0.49	-0.49	-1.78	Agree

Source: Field Survey, 2016. *SD=Standard Deviation*

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Descriptive Statistics on Precautionary Measure

The Table 7 presented precautionary measures. The study revealed that majority (M=3.44 & SD=0.72) agreed that they have pre-employment training when they were newly employed, majority (M=3.47 & SD=0.91) also agreed that they had pre-employment health examination when they were newly employed while another (M=2.56 & SD=1.09) disagreed that employers periodically calls for a health examination monitoring or surveillance on their on their employees and the greater proportion of employees (M=3.43 & SD=0.73) agreed that personal protective equipment (PPE) provided by management is adequate and appropriate. Nonetheless, majority (M=1.33 & SD=0.47) of the employees strongly disagreed that employers periodically send them for trainings to update and upgrade their efficiency and effectiveness and a larger number (M=2.66 & SD=1.25) disagreed that there are first aid boxes at their workplace. Moreover, majority (M=2.23 & SD=0.69) disagreed there is HSE policy that is duly signed by managing directors at their workstation with a simile portion (M=2.15 & SD=0.71) disagreed that implementation of HSE policy is taken seriously by management. More so, majority (M=2.42 & SD=0.86) disagreed that management is completely committed to the health and well-being of their workers and lastly, (M=2.52 & SD=0.74) disagreed that there is a very functional and active occupational health and safety system in place in their company.

Table 7: Precautionary Measure

Statements	Mean ± SD	Skewness	Kurtosis	Decision
I had a pre-employment training when newly employed	3.44 ± 0.72	-0.89	-0.55	Agree
I had a pre-employment entrance health examination when newly employed	3.47 ± 0.91	-1.45	0.73	Agree
My employer periodically calls for a health examination monitoring/surveillance on their employees	2.56 ± 1.09	-0.18	-1.26	Disagree
Personal Protective Equipment (PPE) provided by Management is adequate and appropriate	3.43 ± 0.73	-0.87	-0.61	Agree
My employer periodically send the employees for trainings to update and upgrade their efficiency and effectiveness	1.33 ± 0.47	0.71	-1.52	Strongly disagree
There is a First Aid Box in my workplace	2.66 ± 1.25	-0.23	-1.59	Disagree
There is an HSE Policy that is duly signed by the Managing Director in my workstation	2.23 ± 0.69	-0.33	-0.86	Disagree
Implementation of the HSE Policy is taken seriously by Management	2.15 ± 0.71	-0.22	-0.99	Disagree

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Management is completely committed to the health and well-being of their workers	2.42 ± 0.86	-0.94	-0.97	Disagree
There is a very functional and active Occupational Health Safety System in place in my Company	2.52 ± 0.74	-1.16	-0.71	Disagree

Source: Field Survey, 2016. *SD=Standard Deviation*

IMPLICATIONS AND ONCLUSIONS

This study was conducted to examine a symbiotic relationship between Occupational health hazards and safety culture at Tema oil refinery in Ghana. The study employed both exploratory and descriptive research designs. Convenient sampling technique and structured questionnaires were deployed to elicit information from 186 participants. From the study the causes of accidents were identified as poor working conditions, human errors and the lack of protective clothing. The study results further suggest that noise is an intricate part of job functions at the work environment. This has the potential to impair the hearing of employees both now and may have lasting effect on their hearing in the future. Moreover, there is poor illumination, which may have immense negative effect on the sight of employees particularly those with generic eye problems. From the chemical hazards perspective, the study implied that employees' are perpetually exposed to chemical substances. The incessant exposure to hazardous chemical poses health complications like respiratory diseases, reproductive disorders, cardiovascular diseases, renal diseases and others. Also, protective wears and equipment are lacking resulting in the inhalation of hazardous chemicals and sometimes spill over their skin. The study further illustrated that there are lapses and weak ergonomic arrangements in the Tema Oil Refinery (TOR), which have allowed employees to work at heights with less security as well as using awkward postures while working. More so, there is a clear indication of poor employee welfare hence the Tema Oil Refinery can be described to be product centred other than projecting the interest of employees. In relation to biological health hazards, the study implied that less or no health complications to affect employees at TOR owing to a very minimal or no direct or indirect dealings with biological substances. From the psychosocial health hazard perspective, the study implied that the job description at TOR is very challenging, tedious and time consuming. This has led to many of the employees requesting for transfer from their current department to another. In addition, the right of employees are violated by management and sometimes they harass employees and intimidate them. Finally, the study suggested that although TOR offers pre-employment training before employees are employed, the company lacks continuous policy on training where employees are periodically trained to equip them on health and safety practices. Surprisingly, TOR is less proactive about the health of employees because they lack policies that ensure occasional check-ups for health issues. The study recommends that there is the urgent need to integrate policies and models to effectively manage safety culture at TOR. Furthermore, the study recommends that integrated model is required to comprehensively explain the safety culture at TOR since implementation of occupational health and safety management system (OHS-MS) has been proven inadequate.

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