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An Assessment of Health Hazards in the Ghanaian Building Industry: Sources and Preventive Measures

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***Abstract*:- Majority of injuries or death on construction sites are caused by hazards relating to construction activities. Current research has shown that the number of fatalities and permanent disabilities cases that have happened on Ghanaian construction sites as a result of health hazards is one of the highest as compared to the other industries. This calls for mandatory training of both management and operatives (craftsmen and labourers) before they undertake construction activities on new sites. This paper first identified and highlighted both the generic and specific hazards present on Ghanaian construction sites by assessing and controlling the risks present in order to ensure safe and favourable construction sites. The data collection was carried out through site investigation using structured questionnaires regarding hazards in construction. The construction sites chosen were undertaking various infrastructural works, ranging from high rise buildings to housing development, industrial buildings and institutional buildings. The study considered all the four major health hazards to which construction workers may be exposed.**

The study was conducted on 42 construction sites in the Accra, Kumasi, Sekondi-Takoradi and Tema Metropolises. It was realized that implementation of effective hazards control methods requires different approaches due to changing work environments on building construction sites. The study revealed that majority of health hazards on Ghanaian construction sites that result in accidents are the result of human failure to not identify these hazards at both the design and construction stages, and also to overlook the effects they may cause to both humans and the works.

Keywords: Assessment, Health Hazards, Ghanaian Building Industry, Sources, Preventive Measures

1.0 INTRODUCTION

The building construction industry carries with it a fair share of injuries or death emanating from the presence of potential health hazards on construction sites. The lack of adequate knowledge to identify these hazards continues to show construction in a poor light, and this is undesirable. The construction industry as a whole is often considered to be complex and unique as, for instance, two buildings are rarely identical and the work on each construction site changes from day to day and takes place mainly in the open, exposed to the weather. The utilization of different materials which vary in terms of the structural concept on which the materials are based, the nature of the materials as well as the manner in which the materials are combined also need investigating to make sure that a highly successful standard in terms of health and safety are maintained (Forster and Greeno, 2009). In order to achieve this high standard of health and safety protection for all workers on construction sites, all activities and tasks that can pose health and safety risks need to be identified and assessed and where practicable, remedied.

Health hazards are "substances that are carcinogenic, corrosive, irritant, toxic, or can damage eyes, lungs, mucous membranes, or skin, or which produces acute or chronic effects" (Business Dictionary.com). Hazards that adversely affect human health can be more than one on any construction site. Hence, most Ghanaian construction workers on construction sites can be exposed to improper working conditions and procedures as well as materials that can cause serious illness and affect the worker's health in the long term.

Hazards identification, therefore, is fundamental to construction safety management, as unidentified hazards present the most unmanageable risks (Carter and Smith, 2006). Health and safety consideration should be a major concern to the whole building team. Building personnel can contribute to safety at work by carrying out building operations correctly. Contracting organizations too must safeguard against these hazards, as far as is reasonably practicable, the people who work for them. There should be the incorporation of safe working practices in the process of building as well as risk assessment, and just as Tudun-Wada (1987) has maintained, injuries, industrial hazards and deaths need not to be accepted as an inevitable price to be paid for industrial progress.

Accidents do not just occur. They are mostly caused by unsafe work methods and processes. Workers on construction sites are exposed to various hazardous substances and physical agents, e.g. asbestos, lead, silica dust, organic solvents, sewer gases, welding fumes, radiation, noise and vibration. Extreme exposures to these substances/agents may result in acute injury, chronic illness, permanent disability or even death. Loss of concentration at work and fatigue arising from poor health conditions may increase the risk of accidents. The construction process itself involves a high volume of specialist work and a wide range of trades and activities and also labour intensive (Ward, 1979). Hence, in employing individuals, precaution must be taken to ensure

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that their health is safeguarded against the many hazards encountered in construction activities or tasks and which may bring about some long lasting damage to health or death (Forster, 1989).

Ghanaian construction workers are between 250,000 and 350,000 in number and these workforces construct and maintain roads, houses, workplaces and physical infrastructure. 70-80% of them are found in the informal sector (Ghana Skills and Development Project, 2010). Their work includes many intrinsically hazardous tasks and conditions such as work at heights, excavations, noise, dust, plant and equipment, confined spaces, and electricity. The use of heavy plant and equipment as well as chemical products in the construction industry has the potential for adverse effects on people and the environment. Construction in Ghana has about 2.3% of the Ghanaian working force, but records on the average 40% of the fatalities, representing the largest number of fatalities reported for any of the industry or sectors.

This paper focuses on the need for a thorough appraisal of health hazards in the Ghanaian construction industry particularly for operatives who contribute a lot of man-hours to the industry. Hohoabu (1996:4) has stressed that there is considerable low consciousness on the issue of safety and health hazards in the construction industry in Ghana. Therefore, serious efforts need to be made towards reversing this trend if productivity is to be maintained or even increased, which of course would be very beneficial to the built-environment in Ghana. A healthy workforce is more likely to perform better. This paper is intended to help in achieving this.

2.0 LITERATURE REVIEW

According to Prokopenko et al (1981), a health hazard is the risk or danger of occurrence of work-related diseases, illness or serious discomfort which could harm the physical or mental well-being of a worker or the public. BS 4778 defines a hazard as 'a situation that could occur that has the possibility to cause human injury, damage to property, damage to the environment or economic loss'. The Health and Safety Executive (HSE, 2000) defines a hazard as something with the potential to cause harm. Hazards are categorized principally into two, namely, generic and specific. Generic hazards are present virtually on every site, while those peculiar to a particular site are known as specific hazards.

Construction workers are at risk of exposure to various health hazards that can result in injury, illness, disability, or even death. There are certain factors that can increase the health risk of construction works. This may happen as a result of the operatives themselves; constantly changing construction site environment and conditions; meeting multiple contractors and subcontractors; high turnover of unskilled labourers; constantly changing relationships with other specialist work groups; diversity of work activities occurring simultaneously; and exposure to health hazards resulting from own work as well as from nearby activities("bystander exposure"). These ergonomic hazards are the most frequently occurring health hazards in construction and the cause of most injuries.

Potential hazards can also be in the form of chemicals which can exist in the form of dust, fumes, fibers (solids), liquids, mists, gases and vapours. These chemicals can enter the body through inhalation-breathes in, ingestion-accidental swallowing through eating, drinking or smoking and absorption – absorbed through contact with skin or eyes. The health effects from chemical exposure can either be acute or chronic.

Occupational health and safety is a discipline with a broad scope involving many specialized fields. The International Labour Organisation (ILO) (1969) defines occupational health and safety as encompassing the social, mental and physical well-being of workers, which is the "whole person". In its broadest sense, it should aim at the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations. Occupational health and safety is a primary consideration in the planning and organization of the operations of construction projects.

Poor working conditions of any type have the potential to affect a worker's health and safety. Unhealthy or unsafe working conditions are not limited to factories — they can be found anywhere, whether the workplace is indoors or outdoors. Overall, efforts in occupational health and safety must aim to prevent industrial accidents and diseases, and at the same time recognize the connection between worker health and safety, the workplace, and the environment outside the workplace. Work plays a central role in people's lives, since most workers spend at least eight hours a day in the workplace, whether it is on a plantation, in an office, factory, etc. Therefore, work environments should be safe and healthy. Unfortunately some employers assume little responsibility for the protection of workers' health and safety. In order to develop a successful health and safety programme, it is essential that there should be strong management commitment and strong worker participation in the effort to create and maintain a safe and healthy workplace. An effective management addresses all work-related hazards, not only those covered by government standards. Workers often experience work-related health problems and do not realize that the problems are related to their work, particularly when an occupational disease, for example, is in the early stages. Besides the other more obvious benefits of training, such as skills development, hazard recognition, etc., a comprehensive training programme in each workplace will help workers to recognize early signs/symptoms of any potential occupational diseases before they become permanent conditions.

2.1 Safety Hazards and Risks

Any undesirable or unplanned event or condition is termed a hazard. Accidents are normally not caused by a single hazard but by a combination of series of causes.
Failure to identify hazards on construction sites normally results in accidents and this has been attributed to poor anticipation by those responsible for design, supply and purchase of material and equipment (Alistair et al ,1997).

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Accidents are caused as a result of unexpected occurrences or undesirable events leading from an absolute risk or unknown hazards. These accidents may cause serious injuries or in some cases fatalities not only to operatives or management but to people using adjoining areas and the general public. Hence, these hazards and their associated risks must be managed to reduce the possibility of accidents and lighten harm severity (Campbell, 2008). On construction sites, most occupational accidents are unintentional and are normally caused by unidentified risks or ineffective or incorrect response. A potential hazard is normally an unsafe condition or activity that if left uncontrolled can contribute to an accident. This results in risk and if not assessed during the design and construction process, the probability that a loss might arise is very high and ought to be thoroughly taken into consideration.

Close observations and thorough knowledge of the design and construction procedures is very important. Each activity that makes the complete task should be examined to identify and determine the potential hazards, by considering conditions and actions that can lead to an accident. An accurate and complete data recorded should allow the Site Engineer or Manager the possibilities to develop a recommended safe site procedures needed to prevent accidents.

It is therefore very clear that by identifying the potential major hazards associated with different activities on site, during design and construction stages, the possibility is that a reduction in the risk of injury to employees, the public and damage to the works is obtained.

2.2 Design

In the conventional or the traditional process of building construction projects, the design team is directly employed by the client. The design team normally consists of: the architect (as leader), the quantity surveyor (as financial adviser), the structural engineer (as specialist consultant) and the services engineer(s) (as specialist consultant).

The architect and the structural engineer essentially design both the architectural and structural drawings respectively and the contractor produces the edifice. Ward (1979) mentions that buildings must be well-planned, suitably sited and should satisfy not only the numerous regulations regarding standards of construction, planning and safety, but also the needs of the client in all climatic and environmental conditions. The design team's primary concern during the design stage should be structural reliability, risks of consequences of fire, storm, floods, earthquakes and tremors and details, precision and appropriateness of specification.

Ghanaian contractors should normally be faced with the task of identifying potential health hazards even at the design stage. Most of these contractors, however, have always been faced with these hazards only during the construction stage. Hence, either the workers or the works suffer from this ignorance, sometimes resulting in injuries to these workers or even collapse of buildings under construction. The seemingly lack of knowledge can be linked to the event when a six-storey hotel under construction at Nii Boi Town in Accra collapsed in the dawn of 13th of March, 2014, claiming a life and injuring another. This raised questions on the effective adherence to safety practices in the identification and assessment of potential hazards in building construction in Ghana. In 2012, a six-storey building shopping mall collapsed also at Achimota in Accra claiming the lives of many and injuring many more (Citifmonline.com). In January, 2013, two people also died on the spot and three others were seriously injured, when a two-storey residential building under construction collapsed on them at Antwirifu, near Dormaa-Ahenkro in the Brong Ahafo Region of Ghana (Ghana News Agency, 2013). These raises questions as to the design and construction methods employed as to whether contractors or consultants and their staff are aware of the dangers posed to them as a result of hazards that might have arisen in the course of both the design and construction of building projects.

2.3 Construction

The assembling or erection of fabricated components or elemental parts of the building fabric takes different forms depending on the construction methods and processes involved. The utilization of different construction materials vary in terms of structural concept on which it is based, the nature of the materials as well as the manner in which the materials are combined (Forster and Greeno, 2007). There is the need to further consider certain issues which include: sufficient technical expertise by contractor; feasibility of construction method; quality and availability of supervision and craftsmanship; satisfactory construction materials; site layout; and adoption of realistic safety practices on site.

Many accidents have occurred in building sites due to lack of sufficient technical expertise by the builder in identifying potential hazards. The building industry involves the application of skills in areas of programming of works, detailed design, construction management and erections and in the prudent use of materials (Odumodu, 1986). Absolute lack of knowledge of potential hazards identification during these processes are responsible for the numerous health issues that have arisen in most construction project sites involving numerous operatives and tradesmen.

2.4 Sources of health hazards

Prokopenko et al (1981) have identified the following sources of occupational diseases or health hazards in the building industry: physical hazards, chemical hazards and stress. Various health hazards to which construction workers may be exposed also include biological, ergonomic and machinery hazards.

2.4.1 Physical hazards

These are hazards that are easiest to recognise but are often ignored probably as a result of overconfidence, carelessness, inattentiveness or lack of knowledge. These are hazards that occur as a result of procrastination in making changes to remove such hazards.

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These types of health hazards include vibration, noise, heat, cold, ultraviolet rays, pressure variation, etc. An ear specialist, Dr. Kwabena Bonney , corroborated in the news tabloid , " The Ghanaian Times " (2016:32) , that noise posed health hazards to people exposed to it consistently. He further noted that noise-making was an often-overlooked environmental stress that could lead to chest pains, stress , dizziness and slow heartbeat , amongst other health problems.

2.4.2 Chemical hazards:

These include chemicals, gases, fumes, vapours, metals/materials which may damage the eyes, skin, lungs and other internal organs or bones. Lead for instance, which comes from products as paints and petrol can enter the body through the respiratory tracts, especially when painters inhale vapours and through walls of digestive system especially when unclean paint-stained hands are used to eat. Over 40% of lead inhaled is absorbed into the blood stream, accumulates in body organs, the kidneys and the nervous system and damages the brain over time. Continuous inhalation of asbestos can lead in the long run to lung diseases such as lung fibrosis and lung cancer.

2.4.3 Stress:

In its medical sense, this term denotes the effects of mental and emotional pressure. A building worker who is frightened, insecure, pressurized, indulged in work of high intensity or frustrated may suffer from headaches, palpitation, insomnia, nervous tension, instability or other symptoms.

Stress is one health hazard which affects individuals very differently. People vary greatly in their ability to cope with this and very often a small amount of stress at work added to psychological pressure outside work can produce severe symptoms.

2.4.4 Biological hazards

In its medical sense, ill-health can result from exposure to biological agents, such as bacteria, viruses and dusts. Biological hazards can be classified according to origin as follows:

Animal-borne- e.g. anthrax, brucellosis, rabies
Human-borne- e.g. viral hepatitis
Vegetable-borne - e.g. aspergillosis (farmers' lung).

Dusts also constitute a great biological hazard on site. Dust is that fine dry powder consisting of particles of earth, dirt, etc. Excavating works, movement of excavated materials and all sorts of vehicles and other equipment agitate dust on many construction sites which facilitate the occurrence of all sorts of lung infection.

2.4.5 Ergonomic hazards

Ergonomic hazards are the most frequently occurring health hazards in construction and the cause of most injuries. Ergonomic hazards involve the human system, environmental factors, the man-machine interface and the total working system. These types of hazards occur when the nature of work, body position and working conditions put strain on the body.

Ergonomics emanates from the acceptance of the truth that the machine was made for the operator and not vice versa. The theory or saying has led to a renewed interest in the improvement of efficiency by fitting the job to the man. Ergonomic is a combined effort by psychologists, physiologists, anatomists and engineers, to develop principle of human behavior which, when applied to the design of equipment and the working environment, will reduce the amount of mental and physical effort and/or improve the standard of performance. Studies of human problems associated with work such as the shape and size of dials, the legibility of lettering, the positions of control levels and the dimension and shapes of furniture, have already led to accepted recommendations for good design (Calvert et. al., 1995).

2.4.6 Machinery hazards

This hazard involves an operative injuring himself through coming into contact with, or being trapped between the machinery and any material in or at the machinery or any fixed structure.

The principal hazards associated with machinery are:

-Traps– reciprocating and shearing traps, and in-running nips
- Entanglement – with unguarded rotating parts
- Ejection – of items from machines
- Contact- with, for instance, hot surfaces

The diversity and nomadic nature of construction work makes it dynamic, and this poses a great challenge in protecting the health and safety of workers. The exposure to various forms of health hazards can result in injury, illness, disability, or even death.

2.5 Preventive measures

Every construction project ought to be assessed specifically and all potential hazards taken into account. The main focus is thus to consider the planning and organization of all the project activities both design and construction. These potential hazards identified, be it in the design process or construction activities, need to be planned in such a way that each activity within the project is performed under safe working conditions and also encouraging everyone to work together in developing and maintaining safety.

All employees should undergo adequate training with regard to safety and hazard management and this should be done through effective supervision of works. In the event of an accident, records ought to be maintained after investigation. The causes of such an accident as well as feedback information should be displayed for all participants to have a thorough knowledge of the cause and how it could have been prevented.

The identification of activities or tasks that might go wrong contrary to laid down processes, if assessed and remedied, normally promotes a high standard of health and safety protection to all operatives and craftsmen. In this regard it imperative for top management on construction sites to thoroughly assess the design and construction methods before commencement of the works. Accident or hazard prevention is important for three main reasons:

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humanitarian, economic and legal (Prokopenko et al ,1981).

3.0 METHODOLOGY

The study was conducted on 42 construction sites spanning the Accra, Kumasi, Sekondi-Takoradi and Tema Metropolises. These research areas are the cities in Ghana where a lot of the nation's construction activities usually take place. This basic research focused on assessing the impact of potential hazards on construction workers during construction activities in Ghana. As a result, the descriptive survey design approach was applied utilizing the techniques of questionnaires, interviews and observations.
A set of structured questionnaires was developed for content validity based on detailed literature and analysis of prescriptive theoretical practitioners. It was also administered to building construction professionals comprising construction consultants, contractors and academicians after briefing them about the objective and scope for face validity. Their comments regarding the relevance and content were considered. Also personal observations were made on on-going construction works on the selected sites as well as personal interviews granted by these professionals.

The target population of on-going construction works in the study areas was considered and these included both building and road construction sites. The Likert scale was used to classify and rank for non-parametric statistical test methods of analysis using the Spearman rank correlation coefficient (Naoum, 1999; White, 2000). Respondents were to rank by circling the appropriate rank number which was arranged on a scale of 1 to 5 (Never as rank '1' to always as rank '5').

A Test-Retest was conducted which helped revised and refined the questionnaires before administration (Coolican, 2004). Due to cost and time constraints, the sample coverage was limited to only Accra, Sekondi-Takoradi, Tema and Kumasi. Fifty (50) sets of questionnaires were administered with forty-two (42) responded to, giving a response rate of 84%.

4.0 RESULTS AND DISCUSSIONS:

Table 1: Demographic factors

Analysis	Number	Percentage (%)
1. Sex		
Male	28	66·67
Female	14	33·33
2. Age (years)		
Under 25	10	23·81
25-35	15	35·72
36-45	12	28·57
Above 45	5	11·90
3. Level of Academic Qualification		
CTC I, CTC II / Technician	11	26·19
1st Degree	14	33·33
2nd Degree	16	38·10
3rd Degree	1	2·38
4. Profession		
Site Engineer	10	23·81
Quantity Surveyor	12	28·57
Architect	3	7·14
Project Manager	8	19·05
Planner	3	7·14
Civil Engineer	6	14·29
5. Classification of Company		
D1K1	21	50·00
D2K2	11	26·19
D3K3	6	14·29
D4K4	4	9·52
6. Type of Construction		
High rise	1	2·38
Housing Development	21	50·00
Industrial Building	5	11·90
Institutional Building	15	35·72
7. How long have you been working in the Construction Industry?		
Under 3 years	10	23·81
Under 3-10 years	20	47·62
Under 11-20 years	11	26·19
Above 20 years	1	2·38

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8. How old is the Building Construction Company?		
0-3 years	7	16·67
4-7 years	10	23·81
8-10 years	10	23·81
Above 15	15	35·71
9. Where is the Construction Site located?		
Restricted	10	23·81
Open	15	35·72
Well Demarcated	17	40·47
10. At what stage is / are hazards identified?		
During Design only	12	28·57
During Construction only	30	71·43
11. Frequency of Identification of Hazards		
Always	7	16·67
Often	16	38·10
Sometimes	14	33·33
Rarely	3	7·14
Never	2	4·76
12. How many workers do you have on Site?		
1-10	8	19·05
11-20	15	35·71
21- 30	10	23·81
Above 30	9	21·43

Source: Field Survey, 2015.

Table 2: Physical Hazards

S/No.	FACTOR	MEAN SCORE	RANKING
1	Working from height	3·17	1
2	Ultraviolet rays	2·97	2
3	Noise	2·81	3
4	Heat	2·64	4
5	Vibration	2·61	5
6	Spills on floors	2·39	6

Table 3: Chemical Hazards

S/No.	FACTOR	MEAN SCORE	RANKING
1	Liquids, paints, acids, etc.	2·67	1
2	Metals/materials	2·67	2
3	Flammable and inflammable materials	2·50	3
4	Vapours and fumes	2·47	4
5	Gases like acetylene, propane, carbon monoxide	2·33	5

Table 4: Stress

S/No.	FACTOR	MEAN SCORE	RANKING
1	Insecurity	2·67	1
2	Pressure from work or home	2·67	2
3	Frustration	2·67	3
4	Indulged in work of high intensity	2·64	4
5	Frightened	2·56	5

Table 5: Biological Hazards

S/No.	FACTOR	MEAN SCORE	RANKING
1	Dusts	3·11	1
2	Animal and bird droppings	2·81	2
5	Insect bites	2·78	3
4	Blood and other body fluids	2·64	4
5	Bacteria	2·33	5
6	Virus	2·31	6
7	Fungi	2·31	7
8	Plants	2·19	8

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Table 6: Ergonomic Hazards

S/No.	FACTOR	MEAN SCORE	RANKING
1	Awkward movements	3·53	1
2	Repetitive movements	3·44	2
3	Having to use too much force in executing a task	3·31	3
4	Poor lighting	3·22	4
5	Poor posture	2·94	5
6	Manual handling	2·94	6
7	Improperly adjusted workstation and chairs	2·83	7
8	Workstation height(sitting and standing)	2·72	8

Table 7: Machinery Hazards

S/No.	FACTOR	MEAN SCORE	RANKING
1	Trapped between the machinery, materials and fixed structure	2·56	1
2	Contact	2·56	2
3	Ejection	2·50	3
4	Entanglement	2·44	4

Table 8: Physiological Hazards

S/No.	FACTOR	MEAN SCORE	RANKING
1	Occupational violence	3·17	1
2	Bullying	3·06	2
3	Fatigue	2·94	3
4	Poor design of work and jobs	2·83	4
5	Poor communication	2·61	5
6	Interpersonal relationship	2·58	6

Source: Field Survey, 2015

4.1 Discussions

For the purpose of this study, the Likert scale was used and consideration is given to the scores obtained and which have been built into ranks for this research. The result obtained, however, was based on the opinion of respondents. However, according to Chan and Kumaraswamy (1996a) and Naoum (1999), analysis could be made with both factors of the high and the low scores and rankings of the various responses. In this study, however, only the high scores are analysed because the high scores are the critical ones to be tackled.

The analyses were therefore made based on the scores and the rankings list of the results with emphasis placed on only high scores and rankings. The results and information contained in the tables and line graph of the combined results of all respondents indicated some amount of evidence about the level of identification of potential hazards on construction sites in Ghana. The study also revealed the respondents' perception of the presence of potential hazards on Ghanaian construction sites.

The comparison of the mean scores of the respondents revealed that for physical hazards, ultraviolet (UV) light is the most identified of hazards on Ghanaian construction sites. This is a non-ionising radiation in the 180-400 nanometer wavelength region of the electromagnetic spectrum. Exposure to ultraviolet radiation can initiate a photochemical reaction called erythema within exposed skin. Chronic skin exposure to UV radiation has been linked to premature skin aging, wrinkles and skin cancer. UV exposure can also injure the cornea, the outer protective coating of the eye. To overcome the effect of UV radiation on construction sites, personal protective equipment such as overalls, goggles and safety boots should be put on whilst working. Also all incidents and exposures of UV should be reported to the EPA.

Respondents also chose welding fumes in the chemical hazards category, and these are a complex mixture of metallic oxides, silicates and fluorides. Fumes are formed when a metal is heated above its boiling point and its vapours condense into very fine particles (solid particles). Some ingredients in coatings can have toxic effects. These ingredients include metal working fluids, oils and rust inhibitors, vapours from paints and solvents, lead oxide primer paints and some plastic coatings. There is therefore the need to remove coatings from weld areas to minimize the fume. Also there is the need to minimize grind coatings as grinding dust may be toxic. It is important to follow manufacturer's instructions and safety protocols to minimize the hazards of welding gases.

In the identification of stress as a potential hazard, respondents ranked 'insecurity or insecure work' as the most critical. This is because insecurity in one's work creates a lot of fear and panic amongst operatives in a country like Ghana. This could be due to the economic recession currently being experienced in the country. Most of the operatives on our construction sites are casual workers, therefore most of them do not know when their services will be terminated.

Respondents chose 'dusts' as the most critical hazard in the case of biological hazards. These normally occur as most of our construction works are held outdoors and contractors wanting to save cost normally try as much as possible to ignore the watering of dusty activities. They tend to perform such tasks only when complaints from people using the area around site become very vocal and aggressive.

A construction dust is not just a nuisance but also a real risk to the lungs. The regular inhalation of construction dust can cause diseases like lung cancer, asthma, Chronic Obstructive Pulmonary Disease (COPD) and silicosis.

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These diseases can cause permanent disability and early death to the construction worker.

Awkward movements or postures were the most critical in the case of ergonomical hazards. These normally increase the risk of injury and occur as a result of the load being carried by the operatives being either too heavy or large or difficult to grasp or is unstable. These hazards can be solved or minimised by providing information and training to workers on tasks, and the use of equipment and correct handling techniques.

The critical choice in the machinery hazards that normally occur in typical Ghanaian sites is the fact of being trapped between the machinery, materials and fixed structure. These potential hazards are of significant risks, and injuries sustained tend to be severe. Mechanical plant and equipment mishaps normally cause sprains and strains, open wounds, fractures, electrocution and burns, limb amputation and sometimes death.

The Occupational Health and Safety Regulations (2010) are designed to protect people at work against the risks to health and safety arising from plant and systems of work associated with plant and equipment. Therefore, employers have an obligation to keep their employees safe from injury and risks to their health while at work.

The critical factor chosen by respondents for physiological hazards are occupational violence. Workplace or occupational violence is a much broader problem. This includes: rumours, swearing, verbal abuse, physical assaults, psychological trauma, etc. This is not limited to incidents at the workplace but include off-site functions, e.g. conferences, trade shows or other social events.

This can be overcome by organizing and reviewing information collected from operatives. The trends can be identified by assessing the occupations and locations that are mostly at risk and recording the results of the assessment by developing a prevention programme with specific recommendations for reducing the risk of violence within the construction sites.

5.0 CONCLUSION

It has been found that majority of operatives have not been trained to recognise potential hazards on the construction sites. Also most site management staff lack the necessary experience to assess and control the hazards found on their construction sites.

Majority of accidents and health hazards in construction is the handiwork of the human being. Design aspects of building, to a smaller extent, and construction aspects of building, to a larger extent, have been veritable sources of accidents in the building industry in Ghana but it seems serious attention is not being paid to these, probably due to the various malpractices that have been noted in the industry. A situation whereby quacks design buildings and get approvals from local planning authorities is clearly uncalled for.

Most of our local contracting organisations do not seem to properly consider safety and health at work. This is even more appalling in the case of the numerous small-scale constructions mainly undertaken through "direct-labour" by owners or which Ometan (1987) described as the "owner-contractor" system. Most, if not all, registered building firms in the country do not have resident safety officers per se, although most management members have been tasked to perform such duties in addition to their core roles and responsibilities, hence, the issue of management of safety and health is quite appalling in the Ghanaian building industry.

Despite the existence of a National Building Regulations, 1996 (L.I.1630), this document is long overdue for revision due to the numerous dynamic changes in the built environment since 1996. Its enforcement should also be a paramount task for all government agencies concerned.

6.0 RECOMMENDATIONS

The following recommendations are being made for the effective management of health and safety in the building industry in Ghana:

- Both site management staff as well as operatives need job instruction training or workshops on the recognition of potential hazards on site and should be conversant with the conditions of the sites and the potential hazards that might be present considering the materials to be used as well as the tools and equipment they would employ. Site management staff should also be able well equipped or trained to recognise the potential of occurrence of hazards both at the design and construction stages.
- A potential hazard identification guide should be developed for every construction site on actions or procedures needed to eliminate or minimize the hazards that could lead to accident, injury or occupational illness. The effective provision of guards, safety devices and provision of Personal Protective Equipment (PPE) and ensuring good ergonomics should be the action plan. The list of the required PPE required for the performance of each activity of the job should be ensured.

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