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Compliance with welfare facilities and Personal Protective Equipment (PPE) requirements on construction sites in Ghana

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ABSTRACT

The main aim of this study was to assess the level of compliance with health and safety management requirements on welfare facilities and Personal Protective Equipment by construction firms in Ghana. The study was conducted using a survey and participant field observation as the data collection approaches. The observation was done using an observation checklist developed from the welfare facilities and PPE requirements of the International Labour Organization on 35 construction sites selected across 7 regions of Ghana. The survey was conducted using a structured questionnaire with construction workers (n = 201). The results showed a high level of non-compliance with the provision of sanitary, accommodation, washing facilities, changing rooms and dining facilities. The results also showed that the only welfare facilities prioritised by construction firms were drinking water. Findings on compliance with the provision and use of PPEs showed that most construction firms failed to provide PPE for their workers. Also, the few firms who had them did not comply with the user directives. Therefore, construction firms must implement and enforce compliance with welfare facilities and PPE use. There is also the need for the development of a regulatory framework on occupational health and safety for the Ghanaian construction industry.

1. Introduction

Health and safety is essential as workers perform their required roles (Arpit, Archana and Heli, 2017; Suresh and Vijayarani, 2015; Hughes and Ferret, 2008). Although compliance with health and safety requirements is essential in all work settings, it is of higher relevance in the construction sector due to the sector's immense contribution to development and associated dangers (Boadu et al., 2020; Spillane et al., 2013; Davies and Tomasin, 2002). Even in advanced countries where very sophisticated technologies are used for construction, the industry still accounts for high absenteeism of employees because of injuries and deaths on sites in these countries (Construction Safety Partnership Advisory Committee, 2016; Spillane et al., 2013). Falls from heights, manual handling, transportation of materials and equipment, the use of machines and electrical faults are among the contributory factors to injuries and accidents on construction sites globally (United State Department of Labour, 2017). Therefore, both employers and employees have a role to play in ensuring that construction sites are safe for work. The former must have a health and safety policy which stipulates the health and safety guidelines on-site and should provide a safe environment for the latter to carry out their roles (Kossivi, Xu and Kalgora, 2016). This policy should encompass the provision of PPE and welfare facilities to enhance staff health and safety.

According to Health and Safety Executive (2010), providing welfare facilities and PPE at construction sites is essential to the well-being, health, performance of construction staff, and the overall success of the project. As such, every health and safety plan must make health and safety a priority. In the United Kingdom, the Construction Design and Management

(CDM) Regulations (CDM, 2015) makes it mandatory for employers to provide PPE and welfare facilities such as toilet and washing facilities, potable drinking water, storage, restroom and a dining area for staff to eat during breaks (Health and Safety Executive, 2015). The Health and Safety Executive (HSE) and the Workplace Health Safety and Welfare (WHSW) Regulation also require first aid be added to welfare facilities on construction sites in the UK (Health and Safety Executive, 2013). In Iraq, Hatem et al. (2021) and Abbas et al. (2019) suggested that the labour-intensive and hazardous nature of the construction sector, its sophisticated nature and the unskilled nature of most of its labour force requires the incorporation of PPE and welfare facilities into the construction process. According to Premarathne and Perera (2017), workers on construction sites need to take water, eat, wash and clean their hands, use the washroom and rest to recover from tiredness. They also need protective clothing to keep them away from the hazards of the construction process. Despite the mandatory nature of the need to provide these PPE and welfare facilities, some studies have found that they are often insufficient on construction sites, and in some cases, the regulations are not complied with (Gyansah, 2016; Dok-Yen, Nana Tabi, and Adinyira, 2018)

Ghana's situation is not different. Though the construction sector is not the highest employer of the country's labour force, it produces the largest percentage of accidents, injuries and deaths that arise from work (Kheni et al., 2008). Boadu et al. (2020) and Laryea and Mensah (2010) attributed the high percentage of accidents, injuries and deaths in the construction sector in Ghana to the absence of an effective regulatory mechanism for the sector, lack of compliance with acceptable health and safety procedures and the poor level of commitment from Ghanaians towards health and safety issues. Though Ghana has no dedicated legislative framework for health and safety management in construction (Boadu et al., 2020), there are some legislative frameworks that make provisions for health and safety at work. Article 5 Section 24 (1) of the 1992 Constitution of the Republic of Ghana requires that employers provide a satisfactory, health and safety environment for workers. The National Building Regulations 1996 (LI 1630) and the Ghana Labour Act 2003 (Act 651) also emphasised the need to put in place health safety measures such as welfare facilities and PPESs at the workplace for employees.

In Ghana, though several studies have been conducted on health and safety on construction sites, they have either focused on employer's ability to meet health and safety requirements in their bidding process or other aspects of health and safety (Laryea, 2010; Gyansah, 2016; Dok-Yen, Nana Tabi, and Adinyira, 2018; Gyamfi et al., 2021; Agyekum et al., 2021). The few studies that looked at welfare facilities and PPE have not adequately discussed the level of compliance of employers with the provision and use of these facilities and the employees' satisfaction with such facilities in Ghana. In a recent study, Gyamfi et al. (2021) assessed staff health and safety on some construction sites in Ghana. The study was limited to staff satisfaction with welfare facilities on construction sites in two districts in the Eastern Region of Ghana. As a result, there is paucity of knowledge on the level of employer's compliance with the provision of on-site welfare facilities and PPE on construction sites in Ghana and employees' compliance with the use of these facilities.

This study seeks to assess the compliance of construction firms in Ghana with health and safety management requirements concerning welfare facilities and PPE. In addition, it looks at the availability and quality of welfare facilities and PPEs on construction sites in Ghana and compliance with their use.

2. Literature Review

This section presents an extensive review of the literature on health and safety management in construction, how it evolved and its role in the industry's sustainability. It also reviewed the industry's globally acceptable health and safety management practices with special reference to the International Labour Organization (ILO) guidelines.

2.1 The evolution of health and safety management and the requirements for welfare facilities and PPEs in the construction industry

Construction began right from the inception of man, but attention to health and safety started around the 19th Century and has evolved (Crates, 2017). An early attempt at health and safety management was made by the UK during the construction of its railway lines in the 19th Century when every mile of rail track laid killed at least three workers, and with time the injuries and deaths became more at the tunnelling points (Crates, 2017). According to Burns (2017), the high levels of deaths and accidents on-site compelled the state to amend laws to cause the employers of the rail construction workers to become liable for the on-site deaths (Crates, 2017) .The British government passed the *Health and Safety at Work Act* (1974) to facilitate this, but that did not reduce the deaths. The call for a robust health and safety regulatory framework led to the introduction of the 'Noise at Work' Regulations 1989 which reduced the number of site-related deaths. To further tackle site related accidents and deaths in the construction sector in the UK, the Construction Design and Management (CDM) Regulations was introduced in 1994 (currently CDM, 2015) to ensure that workers are effectively engaged, provided training and the designer's attention is drawn to health and safety issues.

Health and safety management regulations have also evolved in the United States (US) (Durisko, 2018). According to

Reese and Eidson (2006), the unsafe nature of construction and other jobs in the 19th Century raised many advocacies for on-site workers health and safety. Due to this, employees who got injured at work could sue their employers for compensation. Still, there was no guarantee that compensation could be obtained from employers who are mostly able to access very good legal services (Reese and Eidson, 2006). To better the plight of construction and other workers, the state of New York introduced the workers' compensation law which required employers to compensate injured workers at a pre-determined rate in 1910. By 1921, this compensation law was adopted by all states in the US except six states. The US passed its Occupational Safety and Health Act in 1970 and created the Occupational Safety and Health Administration (OHSA) in 1971 to ensure safe and healthy working conditions for workers by putting in measures to enforce health and safety at work as well as providing training in that regard (Durisko, 2018). The importance of health and safety management in the construction industry cuts across national borders. For example, in China, statistics suggested that between 2011 and 2018, an average of 1.87 deaths occurred on construction sites daily. This situation led to calls for a more robust approach to health and safety management in the Chinese construction sector. While some scholars called for strict health and safety management policies (Chen, Fang, and Cho, 2017), others such as Durdyev et al. (2017) and Burns (2017) specifically called for better welfare facilities and PPE for the construction staff on-site.

Though there are different health and safety management regulations across different countries, some fundamental requirements run through all these regulations or most of them (Health and Safety Executive, 2017). The International Organization for Standardization (ISO 45001) was established to incorporate its criteria into any management system. ISO 45001 notes that health and safety management on construction sites should encompass the provision of PPE and welfare facilities (Health and Safety Executive, 2017). According to Gyamfi et al. (2021), welfare facilities on construction sites can be categorised into sanitary conveniences, washing facilities, drinking water, changing rooms and lockers (accommodation), canteens and rest facilities. There may be varying minimum requirements for these welfare facilities from country to country. For instance, in the UK, Regulation 4(2)(b) of the CDM, 2015, in reference to schedule two of the same regulation stipulates the minimum welfare requirements that should be met on any site. Though national laws in various countries may describe the specifications for these facilities, a plethora of studies demonstrate some common features that are expected of any construction site.

Accommodation and rest facilities are expected to be at or closer to the site and should provide sufficient and appropriate shelter during bad weather or for storing clothing after changing into working gear. Such facilities should have tables with reclinable seats for dining, means for boiling water and preparing or warming food, sufficient supply of potable water and should be well-ventilated with adequate lighting (Gyamfi et al., 2021; Construction Safety Partnership Advisory Committee, 2016). Sanitary and toilet facilities should come in the form of flushable water closets, chemical toilets and urinals with running water from the mains, if possible (Health and Safety Executive 2017; 2010). Health and Safety Executive (2013) states that one urinal is sufficient for every 25 workers. The Construction Safety Partnership Advisory Committee (2016) suggests one water closet and one urinal for every 20 workers, but where 100 or more staff are on site, the number could rise to 25 or more. Despite these differences in ratios, what is common is that each of these regulations requires sanitary and toilet facilities on site to be accessible to both men and women, kept clean, and well-ventilated. Apart from sanitary facilities, washing facilities are also a requirement of any construction site. According to Health and Safety Executive (2015), such facilities should supply cold and warm running water and should comprise basins or sinks for washing hands, face and forearms.

There should be sufficient soap with drying facilities, and such facilities should be supplied at a minimum ratio of 1 facility to 25 workers be well-roofed and ventilated (ILO, 1999). To prevent dehydration, employers are also required to provide easy access to potable water that is devoid of contamination and should provide means for drinking, such as cups except in cases where it is a fountain and can be drunk from directly (Gyamfi et al., 2021; CDM, 2015). Apart from potable water, there is the need for changing rooms for workers to change into PPE. Such rooms should have a minimum floor area of 0.5 metres squared (m^2) per person and should have seating and furniture with sufficient hooks for hanging clothes and be spaced at least 460 mm apart (Arpit, Archana and Heli, 2017; Suresh, and Vijayarani, 2015; Construction Safety Partnership Advisory Committee, 2016). Several regulations and studies on construction health and safety have also indicated the need for an eating place (canteen) to ensure staff welfare while on site (Gyamfi et al., 2021; CDM, 2015; Health and Safety Executive, 2015; Tan, 2010). Such facilities must be comfortable for dining and may also be used as rest facilities on the provision that food is not on sale at the premises. A canteen should have a good sitting arrangement, individual drinking cups and should be sited away from workstations to minimize contact with dirt, dust or dangerous substances (Gyamfi et al., 2021).

Apart from welfare facilities, there is the need for Personal Protective Equipment (PPE) such as a helmet, hearing and eye protection, boots and gloves to protect workers from injury (CDM, 2015). The ILO (1999) warned that PPE might have some disadvantages, such as discomfort, cost and the

need for supervision to ensure their appropriate use. Thus, it is better to eliminate hazards as much as possible rather than guarding against them via PPE. Despite this, a number of studies have found PPE to be inevitable in a construction project (Boadu et al., 2020; Chen, Fang and Cho, 2017; Durdyev et al., 2017; Burns, 2017). PPE should include head protection from falling objects, overhead loads and sharp projections that can be found on-site (Spillane et al., 2013). Such helmets should be worn whenever one is on site and should be nationally or internationally tested to ensure they are of quality and should have a chin-strap to fasten them. Another important piece of PPE is protective footwear to protect workers from injuries from sharp objects (Health and Safety Executive, 2017; 2015). Safety boots may vary, but they should be difficult to penetrate below and up, and have a steel toe-cap (CDM, 2015). There is also the need for hand and skin protection. Protection for the hand and skin can best be achieved by using proper manual handling methods and equipment, as well as wearing the right protective equipment, such as gloves and gauntlets (Burns, 2017). To protect the eye from flying materials, dust and radiation on site, goggles should be used. A durable scaffold, ladder or a mobile access platform should be used. A safety harness may also be used but can be replaced with a safety net (CDM, 2017).

2.2 Occupational Health and Safety (OHS) management frameworks in the Ghanaian context

The legal framework for employee health and safety has been defined by numerous international regulations (Agyekum, Ghansah and Tetteh, 2021). In the case of Ghana, occupational health and safety laws have been classified as fragmented and lacking in scope (Osei, 2013; Ofori, 2012). This is because the country's occupational health and safety regulations do not apply to many important economic sectors (Agyekum et al., 2021). Currently, a national policy on occupational health and safety management does not exist in Ghana, as mandated by the ILO convention 155 (1981). This is because the ILO convention 155 has not yet been ratified by Ghana, hence, the international OHS regulation is not applicable in Ghana (Annan, Addai and Tulashie, 2015). Nevertheless, Ghana has ratified several important ILO conventions on occupational health and safety, including the Underground Work (Women) Convention, 1935 (No. 45), the Radiation Protection Convention of 1961, the Guarding of Machinery Convention of 1963, the Hygiene (Commerce and Offices) Convention 1964, the Working Environment (Air Pollution, Noise and Vibration) Convention 1977, the Labour Inspection Convention 1947, and the Working Environment Convention of 1977 (Kheni and Braimah, 2014).

In relation to the construction sector, Ghana has no health and safety regulations developed specifically for the construction industry (Kheni and Braimah, 2014). Considering the high-risk nature of the sector, this limitation has made the implementation of health safety standards on construction sites very difficult. However, the Factories, Offices and Shops Act 1970 (Act 328) and the Labour Act 2003 (Act 561), which have some regulations about health and safety management in the work environment, are considered in some cases (Maxwell *et al.*, 2015). Specifically, the Factories, Offices, and Shops Act 1970 (Act 328) caters for factories, offices, shops, ports, and construction (Kheni and Braimah, 2014). Prior to the enactment of the Factories, Offices, and Shops Act 1970 in Ghana, the concept of occupational health and safety (OHS) in the industry was already in place. Since then, Ghana's industrialization has continued apace, with systems and standards for occupational health and safety (OHS) emerging across the country (Annan et al. 2015). Therefore, following Ghana's independence, the British legal and institutional framework left behind a legacy of occupational health and safety rules. The first regulation was enacted in 1952 to protect workers in the mining and wood processing industries (Agyekum et al., 2021). This legal framework was known as the Factory Ordinance (Laryea, 2010). The Factory Ordinance was operational for 12 years until its repeal in 1970. This was replaced with the more expanded Factories, Offices and Shops Act 1970 (Act 328] (Laryea, 2010; Cooney, 2016) (Agyekum, Ghansah and Tetteh, 2021). This Act (Act 328) is still operational in Ghana. According to Clarke (2005), the Factories, Offices, and Shops Act 1970 (Act 328) and the Mining Regulations 1970 (LI 665) are two significant regulations that have provided guidelines for the provision of OHS services, practice, and management in Ghana (Annan, Addai and Tulashie, 2015).

A study conducted by Mustapha et al. (2018) on the examination of occupational health and safety practices also affirmed that Ghana's construction sector has not ratified the International Labour Organisation (ILO) convention 1981 (No. 115), thus affecting activities in the construction industry (Mustapha, 2016). Evidence suggests that contractors and project managers in developing countries do not prioritize health and safety as much as they consider other project parameters (Agyekum et al.2021; Boadu et al., 2020; Durdyev et al., 2017). This is partly attributable to the lack of a harmonized health and safety regulation for the construction industry in Ghana (Simpeh, Bamfo-Agyei and Amoah, 2021; Gyamfi et al., 2021; Boadu et al., 2020). Despite the lack of a single regulatory framework, the National Building Regulations 1996 (LI 1630) charged construction firms to provide welfare facilities and PPE on site.

2.3 Compliance in health and safety management in Ghana's Construction sector

There is no doubt that the absence of enabling legal and institutional environments in developing countries results in a dearth of the enforcement of occupational health and safety

regulations (Kheni and Braimah, 2014). It is widely acknowledged that a lack of compliance in construction health and safety management is a major contributor to construction site accidents (Simpeh et al.2021). Even worse, some companies do not realize that they have the legal obligation to protect their employees' well-being (Puplampu and Quartey, 2012). Empirical evidence demonstrates that even in jurisdictions where there are construction sector-specific health and safety management frameworks, insufficient supervision and monitoring results in non-compliance (Andolfo and Sadeghpour, 2015), poor material handling techniques (Alinaitwe and Junior, 2007), defective equipment use (Vasconcelos and Junior, 2015), inadequate training (Matete et al., 2016), improper use of PPE (Chandi et al., 2018; Simpeh et al.2021) which in the end affect output. Several studies (Orji et al., 2016; Ahmad et al., 2016; Hong et al., 2018) have concluded that human factors such as the lack and improper use of PPE and welfare facilities are the primary cause of construction site accidents. Workers' negligence and a lack of safety knowledge are among these issues, as are the poor usage of PPE (Idris, 2016; Hagan et al., 2021).

The fact that Ghana, like many African countries, lacks a comprehensive OHS framework designed for the construction industry presents a significant problem towards OHS compliance on construction sites (Quartey and Puplampu, 2012; Simpson and Sam, 2020; Boadu et al., 2020; Agyekum et al.,2021). This problem is further worsened by the lack of established frameworks for enforcement of OHS by the few regulations that are relied on partially by the construction sector (Gyamfi et al., 2021; Boadu et al., 2020; Kheni and Braimah, 2014). In a recent study, Gyamfi et al. (2021) examined the impact of welfare facilities on building construction workers performance in the Eastern Region of Ghana. The study identified the welfare facilities provided by building construction firms and employees' satisfaction with welfare facilities via a survey of 80 employees. The study found unavailability of sanitary, toilet facilities, washing facilities and changing rooms, while drinking water and locker facilities were available but not adequate. The study further found high levels of dissatisfaction with the condition of welfare facilities from the employees' point of view.

The limitation of this study is that it was limited to welfare facilities and did not consider PPE which are an essential part of OHS. The study was also limited to building projects in two districts in the same region; thus, the extent to which the findings could be generalised for the construction sector in Ghana is limited. Prior to Gyamfi et al. (2021), Boadu et al. (2020) examined how the peculiar characteristics of the construction industry in developing countries impact on the industry's health and safety management using questionnaire surveys from construction industry professionals in Ghana. The results showed that a lack of a single regulatory authority and framework for health and safety in Ghana's construction industry, among other factors, presents huge challenges to health and safety management. Though these studies demonstrated the health and safety predicaments of the construction industry in Ghana, they did not touch on compliance with PPE and welfare facilities as aspects of health and safety. Thus, the level of compliance with the use of PPE and the availability and quality of welfare facilities as requisites for health and safety in construction has been understudied in Ghana.

2.4 Conceptual framework

Following the review of extant literature, this conceptual framework (Figure 1) was developed. It starts with a Health and Safety Policy. Each policy must stipulate the provision of welfare facilities and PPE on-site to ensure proper health and safety outcomes for workers. There is a direct relationship between the quality of these facilities, compliance with their use and health and safety on construction sites. The quality of welfare facilities, PPE and strict compliance with their provision and use will result in desirable health and safety on site and vice-versa.

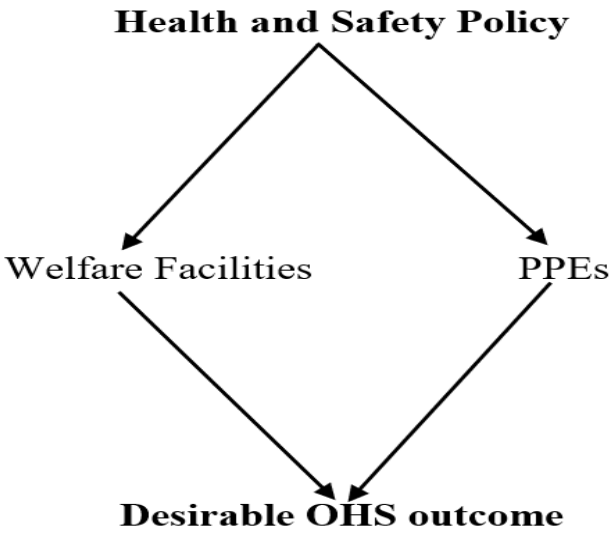

Figure 1: Figure 1: Conceptual framework

Source: Authors own construct, 2022

3. Methodology

To assess the level of compliance with welfare facilities and PPE requirements on the construction sites in the study areas, participant observations and a survey were used (Creswell and Creswell, 2018). The method of observation used was quantitative in nature. It was specifically used to assess the quality and quantity of welfare facilities on sites visited.

3.1 Sampling and sample size

To unravel the level of compliance with health and safety management requirements regarding welfare facilities and PPE, there was the need to find sites with on-going construction work. These projects were large-scale projects that required all or most of the health and safety issues set out to be investigated (Gyamfi et al., 2021). Based on a pre-determined criterion (project should be large enough to engage at least 25 workers, construction should be on-going at the time of the study, the local authority should have permitted project and the project owners should agree for on-site staff to be included in the study. Purposive sampling was used to determine these sites by first visiting these sites and convincing project managers to agree to participate in the study. After determining the sites, the researchers sent introductory letters to the site managers about the study and offered them the opportunity to consent to participate in it or not. This ensured that there was no visit to a site without the consent of the owners and or project manager. Thirty-five sites that met the inclusion criteria were selected from the Greater Accra, Ashanti, Northern, Bono, Western, Volta and Upper West regions. The selection of sites in seven different regions provided an avenue to compare the level of compliance with OHS in various regions of Ghana for a better understanding of the issues. Table 1 contains a summary of the sample size determination and the number of questionnaires administered

Table 1: Sample size determination for construction workers

Region	No. of Construction sites	Administered	VR	R-R (%)	AR-R (%)
Greater Accra	15	65	62	95	
Ashanti	7	32	32	100	
Bono	1	12	9	75	
Northern	3	21	19	90	94
Volta	2	17	17	100	
Western	2	26	25	96	
Upper West	5	37	37	100	
Total	**35**	**210**	**201**		

N/B: VR= Valid Responses; R-R= Response Rate; AR-R= Average of all Response Rates.

3.2 Data collection and analysis

The study collected data through survey and observation. While the former helped to obtain quantitative data on employees' compliance with the use of PPE, the latter made it possible to assess employers' compliance with the provision of welfare facilities. The survey was conducted using semi-structured questions while the observations were conducted using an observation guide. The questionnaires were administered to the workers to assess their access to and use of PPE. A total of 210 questionnaires were administered to workers who were accidentally sampled during their breaks. Though all questionnaires were retrieved, the valid responses used for the analysis were two hundred and one (n=201), thus resulting in a response rate of 94% for the surveys (See Table 1). The responses from the survey and the observed values for welfare facilities were analysed using the Statistical Package for Social Sciences (SPSS) version 24 in the form of descriptive statistics. It was presented using frequency tables.

4. Results

4.1 Characteristics of respondents

The results (Table 2) depict a high disparity between the number of males and females engaged in construction-related jobs in Ghana. Among the 201 respondents in this study, 189 (94%) were males, while 6% were females. In terms of the age dynamics of the respondents, 40% were between 25 to 34 years, while 35 to 44 years and 45 to 54 years made 28% and 17%, respectively. Only 12% of the 201 respondents were below 25 years of age. In terms of the roles of the respondents on the sites, 176 (88%) were labourers, while the remaining 12% comprised project managers and health and safety managers. The results (Table 2) also indicate that majority of the workers on the construction sites either had no formal education or had basic education. These formed 49% and 24%, respectively.

Table 2: Characteristics of Respondents

	Frequency	Percent
Sex		
Male	189	94
Female	12	6
Total	201	100
Age		
Below 25 years	25	12
25-34 years	80	40
35-44 years	57	28
45-54 years	34	17
above 54 years	5	2
Total	201	100
Job Title		
Health and Safety manager	9	4
Labourer	176	88
Project Manager	16	8
Total	201	100

Level of Education		
Diploma	8	4
Degree	20	10
Masters	2	1
Senior High School	23	11
Basic School	49	24
No formal Education	99	49
Total	201	100

4.2 Compliance with the provision of welfare facilities

The first objective of this study was to assess the level of compliance of Ghanaian construction firms with the ILO's guidelines on the provision of welfare facilities on site. To achieve this, observation was used on the thirty-five selected sites sampled for the study. A checklist of the ILO's requirements concerning welfare facilities was used as a guide on all sites visited. The results (Table 3) showed that the provision of sanitary facilities as a health and safety requirement is not a priority for most construction firms. Also, 30 sites (85.7%) had no toilets, and their workers relied on public toilets or other means that were distanced from the site. Out of the 5 sites that had toilets, only 1 had a hand wash sink and also met the 1:25 persons maximum requirement in the ILO requirements for toilets on site. While 33 sites (94.3) had urinals, most of them failed to meet the requirements for urinals. Only 1 site (2.9%) had urinals for both men and women and met the 1:25 persons maximum ratio. In addition, as many as 31 sites (88.6%) had sanitary facilities in a very unhygienic state at the time of visit.

Another welfare facility of interest was accommodation. While 30 sites (85.7) had well ventilated accommodation facilities which were located closer to the site, only 3 (8.6%) had sufficient shelter, tables and chairs for all staff (See Table 4). Accommodation on the remaining 27 sites was only made for high-ranking members of the team and important persons like the project owners who visited the sites. In addition, as many as 33 sites (94.3%) had potable water, but only two representing (5.7%) had means for boiling water and warming food (Table 4). Similar to sanitary and accommodation facilities, compliance with the provision of washing facilities where workers could take showers after work was very poor. Out of the 35 sites visited, only 1 (2.9%) had washing facilities. It had drying facilities, hand wash sink, hot and cold-water supply, was well roofed and ventilated and also met the 1:25 persons maximum ratio specified by ILO. The remaining 97.1% of the sites had none of these facilities. On 32 (91.2%) sites, soap was found (Table 5). Staff on the sites with soap without washing facilities indicated that they sometimes improvised to take showers in wooden structures made by themselves on site or in the uncompleted buildings. Evidence of such structures were found on 21 sites.

In all the sites visited, drinking water was the most prioritised welfare facility. All 35 sites (100%) had potable drinking water, with 31 (88.6%) of such sites providing easy access to such water with drinking cups (Table 6). Three sites (8.6%) supplied drinking water via taps/fountains. In contrast, the remaining 32 (91.4%) supplied drinking water via other means such as off-site packaged sachet water and via gallons. Just like accommodation, changing rooms were also not prioritised. Only one site out of the 35 sites had two changing rooms made of wooden panels (Table 7). The remaining 34 sites representing 97.1% had no changing rooms. The staff arrive on site with their working outfits and return home in them after the day's work. According to the results (Table 8), 8 (22.9%) out of the 35 sites had areas designated as dining areas, with the remaining 77.1% having no such facilities. Only one of the eight sites had a well-enclosed dining area protected from the weather with chairs and tables, for eating. Also, 88.6% of such sites had food sold by private vendors closer to the site, while 11.4 % of the sites provided food as packed meals for staff. A worrying situation found was that 6 of the sites (17.1%) had their dining areas closer to dust and other site activities that could involve toxic substances (Table 8).

4.3 Compliance with PPE requirements

The second motive of this study was to find out if construction firms in Ghana comply with the PPE requirements set out by the ILO for construction sites. The workers that took part in the survey were asked if they had PPE supplied to them by their employers. Whether such PPE were of the right quality and if they used them. Specifically, they were asked to indicate the availability of these PPE to them at the time of their work or their knowledge of such items being available on site. These sites were heavy construction sites that were carrying out activities that required the use of PPE. Table 9 presents the distribution of 201 workers responses about compliance with each of the PPE types.

Generally, the compliance with the provision of PPE on the side of the employer from the perspective of the employees on site was not different from the observed availability of welfare facilities. Out of the 201 respondents, 89 (44.3%) agreed that their employers provided them with helmets, while the remaining 55.7% did not receive such helmets (Table 9). The number of employees whose helmets had chin straps as prescribed in literature was also 89 (44.3%), with 42.8% of such staff indicating that they received helmets of the expected quality. At the same time, the remaining 57.2% indicated displeasure with the quality of their helmets. With almost half of the respondents who received helmets, only 34 (16.9%) indicated that they use such helmets. This implies

that head protections were not in their required form on most of the sites visited.

On foot protection, the situation is not different. While all 201 respondents indicated that they wear protective footwear, only 16.4% of such footwear were provided by employers. The number of workers with footwear with toe caps and hard soles are difficult to penetrate by sharp objects made up 9% and 20.9% of the respondents. This implies that although every worker wear footwear on site, majority of the footwears are not the required protective footwear. Only a small percentage of those that are protective are provided by the employer. Some workers indicated that their footwears were brought from previous projects they have done for others. On hand protection, 20% of the respondents had gloves provided by their employers, but only 8% used these gloves on site. Similarly, while 2% of the workers admitted to doing jobs that required goggles and having them provided by employers, none of the 201 workers actually used goggles on site (Table 9)

Table 3: Sanitary Facilities

	Responses	Frequency	Percentage
Flushable toilet available	Yes	5	14.3
	No	30	85.7
	Total	35	100.0
Has running water supply	Yes	14	14.3
	No	86	85.7
	Total	100	100.0
Wash Hand Basin/sink	Yes	1	2.9
	No	34	97.1
	Total	35	100.0
Toilet Meets 1:25 ratio	Yes	1	2.9
	No	34	97.1
	Total	35	100.0
Toilet is well ventilated	Yes	4	11.4
	No	31	88.6
	Total	35	100.0
Has urinal	Yes	33	94.3
	No	2	5.7
	Total	35	100.0
Urinal for both gender	Yes	1	2.9
	No	34	97.1
	Total	35	100.0
Sanitary facilities are clean	Yes	4	11.4
	No	31	88.6
	Total	35	100.0
Urinal meets 1:25 ratio	Yes	1	2.9
	No	34	97.1
	Total	35	100.0

Table 4: Accommodation Facilities

	Responses	Frequency	Percent
Accommodation facility available	Yes	30	85.7
	No	5	14.3
	Total	35	100.0
Facility is closer to Site	Yes	30	85.7
	No	5	14.3
	Total	35	100.0
Has sufficient Shelter for all staff	Yes	3	8.6
	No	32	91.4
	Total	35	100.0
Has Sufficient tables for staff	Yes	3	8.6
	No	32	91.4
	Total	35	100.0
Has sufficient chairs	Yes	3	8.6
	No	32	91.4
	Total	35	100.0
Has means for boiling water and warming food	Yes	2	5.7
	No	33	94.3
	Total	35	100.0
Well ventilated with lighting	Yes	30	85.7
	No	5	14.3
	Total	35	100.0
Has potable water	Yes	33	94.3
	No	2	5.7
	Total	35	100.0

Table 5: Washing Facilities

		Frequency	Percent
Washing facility available	Yes	1	2.9
	No	34	97.1
	Total	35	100.0
Has cold water supply	Yes	1	2.9
	No	34	97.1
	Total	35	100.0
Has hot/warm water supply	Yes	1	2.9
	No	34	97.1
	Total	35	100.0
Hand wash sink available	Yes	1	2.9
	No	34	97.1
	Total	35	100.0
Has Soap	Yes	32	91.4
	No	3	8.6
	Total	35	100.0
Drying facilities	Yes	1	2.9
	No	34	97.1
	Total	35	100.0
Well roofed and ventilated	Yes	1	2.9
	No	34	97.1
	Total	35	100.0
Meets 1:25 persons maximum ratio	Yes	1	2.9
	No	34	97.1
	Total	35	100.0

Table 6: Drinking Water

		Frequency	Percent
Potable water available	Yes	5	100
	No	0	0
	Total	35	100.0
Potable water easily accessed	Yes	31	88.6
	No	4	11.4
	Total	35	100.0
Cups available for drinking	Yes	31	88.6
	No	4	11.4
	Total	35	100.0
Water supplied by taps/ fountain	Yes	3	8.6
	No	32	91.4
	Total	35	100.0
Water supplied by other means	Yes	32	91.4
	No	3	8.6
	Total	35	100.0

Table 7: Changing Rooms

		Frequency	Percent
Changing rooms available	Yes	1	2.9
	No	34	97.1
	Total	35	100.0
Have a minimum floor area of 0.5 metres squared (m2) per person	Yes	1	2.9
	No	34	97.1
	Total	35	100.0

Has seats and Tables	Yes	1	2.9
	No	34	97.1
	Total	35	100.0
Sufficient hooks for hanging clothes	Yes	1	2.9
	No	34	97.1
	Total	35	100.0

Table 8: Dining Area

		Frequency	Percent
Dining area available	Yes	8	22.9
	No	27	77.1
	Total	35	100.0
Availability of eating tables and chairs	Yes	1	2.9
	No	34	97.1
	Total	35	100.0
Distanced from toxic materials	Yes	6	17.1
	No	29	82.9
	Total	35	100.0
Protected from weather	Yes	1	2.9
	No	34	97.1
	Total	35	100.0
Availability of Drinkable cups	Yes	5	14.3
	No	30	85.7
	Total	35	100.0
Food sold by vendors on site	Yes	31	88.6
	No	4	11.4
	Total	35	100.0
Availability of food cooking/heating point	Yes	1	2.9
	No	34	97.1
	Total	35	100.0
Food brought as packed meals	Yes	4	11.4
	No	31	88.6
	Total	35	100.0

Table 9:Compliance with PPE requirements on site

			Frequency	Percent
Head Protection	Employer provides Helmets	Yes	89	44.3
		No	112	55.7
		Total	201	100
	Helmets are of right quality	Yes	86	42.8
		No	115	57.2
		Total	201	100
	Helmets have chin straps	Yes	89	44.3
		No	112	55.7
		Total	201	100
	Employees who use helmet	Yes	34	16.9
		No	167	83.1
		Total	201	100
Foot protection	Employer provides protective footwear	Yes	33	16.4
		No	168	83.6
		Total	201	100
	Sole is difficult to penetrate by sharp objects	Yes	42	20.9
		No	159	79.1
		Total	201	100
	Footwear has toe caps	Yes	18	9.0
		No	183	91.0
		Total	201	100
	Employees who wear protective footwear always	Yes	201	100
Hand Protection	Employer provides gloves	Yes	40	19.9
		No	161	80.1
		Total	201	100
	Employees wear gloves	Yes	16	8.0
		No	185	92.0
		Total	201	100
Eye protection	Employer provides goggles	Yes	4	2.0
		No	197	98.0
		Total	201	100
	Employees wear goggles	No	201	100

5. Discussions

This study sought to assess the level of compliance of Ghanaian construction firms with the ILO's guidelines on the provision of welfare facilities and PPE on site. The results indicated low compliance with the provision of sanitary (toilets and urinals), accommodation, washing, changing rooms and dining areas, while compliance with the provision of drinking water was high. With PPE, most of the construction firms failed to provide them for their workers, and the few who had them did not comply with their use. In addition, foot and hand protection in the form of protective footwear and gloves were generally poor.

The findings in this study concur with similar findings concerning health and safety on construction sites. In Gyamfi et al. (2021), similar findings were made concerning the state of welfare facilities on 20 construction sites in the eastern region of Ghana. Gyamfi et al. (2021) found no sanitary, washing facilities, and changing rooms on the 20 sites in their study, while drinking water was found but these were inadequate. Although the findings made in this study concerning sanitary, accommodation and washing facilities are an improvement on the situation found by Gyamfi et al. (2021), the picture is that the provision of these facilities was inadequate. Gyamfi et al. (2021) found that drinking water was insufficient in the 20 sites used for their study. However, this current study contradicts this by indicating that there was sufficiency in the supply of drinking water on site. The study found that most construction firms were not complying with ILO standards. This corroborates the finding of Boadu et al. (2020), who posited that the lack of a single regulatory framework for OHS in the Ghanaian construction sector makes compliance with health and safety requirements challenging. This also confirms the finding of Kheni and Braimah (2014), who demonstrate the lack of progress toward better health and safety outcomes in the industry in Ghana. It further supports the findings made by Simpeh et al. (2021), Quartey and Puplampu (2012) Simpson and Sam (2020) that the lack of a legislative framework is one of the reasons why OHS in the construction sector in Ghana is poor. In terms of poor compliance and provision of PPE, the findings made by the study also concur with previous studies. For instance, findings made by Chandi et al. (2018), Simpeh et al. (2021), Idris (2016), and Hagan et al. (2021) suggest that the high levels of accidents and deaths associated with the construction industry are a result of the lack of PPE and its improper usage on construction sites. In this study for instance, two workers undertaking activities that required the use of goggles did not use them even though the employer provided them. This finding demonstrates the lack of monitoring and supervision by employers' results in non-compliance with the use of PPE, as found by Matete et al. (2016)

6. Conclusions and recommendations

The aim of the study was to assess the level of compliance with the provision of welfare facilities and PPE on construction sites in Ghana. Based on the results, the study concludes that there is poor compliance with the OHS requirements of welfare facilities and PPE in Ghana. The study also concludes that the poor compliance with the provision of welfare facilities and PPE is as a result of the lack of a regulatory framework in the Ghanaian construction industry. There is the need for a regulatory framework for OHS to be developed for the Ghanaian construction industry. It is recommended that construction firms make the necessary efforts to implement and enforce the compliance with welfare facilities and PPE use. They should ensure the health and safety standards are met towards ensuring the welfare and health of workers. This study provides information on the happenings associated with welfare services on construction sites. Further studies can be conducted on the causes of non-compliance with the provision and use of PPE from the perspectives of both employers and employers. This will help provide ways of minimising accidents on construction sites.

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