Studies have established that there is lack of adequate understanding of how organisational characteristics influence the health and safety (H&S) practices of small and medium-sized construction companies (construction SMEs). This necessitated the evaluation of the influence of organisational characteristics on H&S practices of construction SMEs with a view to determining favourable conditions for effective safety performance. The use of mixed methods approach was adopted for the study. The research data were collected with the use of questionnaires and observation. Results of the study revealed that the organisational characteristics of construction SMEs are significant predictors of H&S practices. It was concluded that organisational characteristics have significant influence on the H&S practices of the Nigerian construction SMEs. It was recommended that construction stakeholders should develop positive attitude and commitment towards H&S management.

Abdullateef Shittu

Organisational Characteristics and Construction Firms' Safety

Influence of Organisational Characteristics on the Safety Practices of Construction Firms in Abuja, Nigeria

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INFLUENCE OF ORGANISATIONAL CHARACTERISTICS ON THE SAFETY PRACTICES OF CONSTRUCTION FIRMS IN ABUJA, NIGERIA

(A Thesis Submitted in Partial Fulfilment of the Requirements for the Award of Doctor of Philosophy in Quantity Surveying, Ahmadu Bello University, Zaria, Nigeria – July, 2016)

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ABSTRACT

Studies have established that there is lack of adequate understanding of how organisational characteristics influence the health and safety (H&S) practices of small and medium-sized construction companies (construction SMEs). This necessitated the evaluation of the influence of organisational characteristics on H&S practices of construction SMEs with a view to determining favourable conditions for effective safety performance. The use of mixed methods approach was adopted for the study. The research data were collected with the use of semi-structured questionnaires, site observation and visual and audio devices. The questionnaires were administered to 436 randomly selected construction SMEs registered with Abuja's business address with Corporate Affairs Commission in Abuja. The response rate of the questionnaire was 49.37%. Factor analysis was used to reduce the 46 important H&S practices of construction SMEs, which were categorised under 5 core groups, to 8 major practices, while the H&S regulations were reduced to one major group. Analysis of data was undertaken with the use of percentage, mean item score, factor analysis and hierarchical multiple regression analysis. H&S Education and Training ranked highest among the five important core H&S

practices. "Provision of First Aid Box" and "Rewarding Workers who Demonstrate Exemplary Safe Behaviour on Site" were among the practices which are the most important H&S practices. The organisational characteristics of construction SMEs were discovered to be good and significant predictors of H&S management practices. It was concluded that organisational characteristics have significant influence on the H&S practices of the Nigerian construction SMEs. Major recommendation from the study was that Government, owner/managers of construction SMEs and workers should develop positive attitude and commitment towards H&S management.

Keywords: Construction SMEs, Health and safety practices, Organisational characteristics.

1.0 INTRODUCTION

The construction industry has been identified as the most risky and hazardous of all industries in terms of health and safety because its activities pose serious health and safety (H&S) risks to workers, users of construction facilities and the public (Idoro, 2011). It has been found that 25 – 40% of fatalities in the global occupational environment are contributed by construction – related activities (International Labour Organisation (ILO), 2001, 2005a and 2005b; Kheni & Braimah, 2014). According to Akpan (2011), management policy, especially in developing economies is yet to properly address the issue of employee H&S. This has resulted in frequent accidents and hazards, leading to high costs in hospital bills, salaries for hospitalised workers and compensations to victims. Increased labour turnover, absenteeism, strained management-labour relationship; operational inefficiency and ultimately, decreasing performance become noticeable in such organisations. Okpan and Agha (2013) opined that the problem of H&S in the workshop, sites, built facilities and the field in Nigeria cannot be overemphasised. Hence, careless attitudes, overconfidence and failure to provide H&S measures and periodic H&S seminar for the stake holders and general public triggers a high risk of accidents in the construction industry.

Construction companies have different level of H&S performance as determined by their organisational characteristics. The organisational characteristics of construction companies are the unique or distinguishing features which define the performance of the construction companies. Some of the important ones are age, size, experience, annual turnover and growth rate of construction companies (Dada

et al, 2012). In developing countries and indeed Nigeria, there are fewer large construction companies compared with small and medium-sized construction companies (Kheni, 2008; Idoro, 2011). These small and medium-sized construction companies (construction SMEs) lack the capability to manage complex construction projects in a safe manner. They are therefore known to have peculiar H&S problems as reported by Diugwu *et al.* (2013). The construction SMEs operate within domestic markets and also play an important role in the national economy. The H&S risks posed by the activities of construction SMEs cannot be ignored due to their high population.   Kheni *et al.* (2007) and Kheni *et al*. (2008) found that foreign contractors operating in developing countries effectively manage health and safety whereas indigenous construction businesses have no effective arrangements in place for controlling H&S risks. This is because H&S standards on sites are rarely enforced to the latter due to lack of resources for enforcement and lack of enabling environment which promotes occupational H&S. In the light of this, Kheni (2008) recommended that the particular context of developing countries requires a holistic view of H&S management that takes account of the contextual environments of construction SMEs.

The contextual environment of construction SMEs, according to Kheni (2008), is generally divided into two – the internal and external environments. The internal environment is broken down into skills, characteristics, management, competencies and resources of owners/managers of construction SMEs which are defined by organisational characteristics and H&S attitude and culture of construction SMEs. The external environment of construction SMEs on the other hand is divided into political (institutional and legal), economic, national culture, technological, competitors and customers which are factors that indirectly influence the H&S management practices of construction SMEs. This study was based on the philosophy of studying the organisational characteristics influences on H&S management practices which has direct bearing to the internal environment of Nigerian construction SMEs. However, it has been established that there is no sufficient understanding of how the organisational characteristics influence the H&S practices of construction SMEs. This leads to the increase in the number of annually recorded occupational illnesses and fatal accidents in the Nigerian construction industry, resulting to poor performance of the Nigerian construction SMEs. In view of this, Vinodkumar and Bhasi (2009) established that the perception of H&S

practices differed significantly based on employees' qualification, age and years of experience. Agumba and Haupt (2014) also recommended that further research be carried out to employ the use of a multiple linear regression to determine if these demographic attributes influence H&S practices. This necessitated the use of hierarchical multiple regression analysis to establish the relationship between these organisational characteristics (years of experience, number of employees, age of firm and firms' growth rate) and H&S practices of construction SMEs in Nigeria using Abuja as the study area. The identified problem was therefore addressed in the study by evaluating the influence of organisational characteristics on the H&S management practices of Nigerian construction SMEs with a view to determining favourable conditions for effective safety performance. The following objectives were pursued in order to achieve the aim of the study:

i.   To identify the organisational characteristics which influence the activities of the small and medium-sized construction companies.

ii.   To examine the H&S management practices adopted by the small and medium-sized construction companies for controlling the risks of hazards in the construction industry.

iii.   To establish the relationship between organisational characteristics and the H&S management practices of the small and medium-sized construction companies.

iv.   To determine favourable conditions for effective safety performance of small and medium-sized construction companies.

In order to address the research problem and achieve the aim and objectives of the study, the research studied construction SMEs who were construction contractors registered with Abuja's business addresses with Corporate Affairs Commission in Abuja and can be classified as SMEs based on the number of full-time employees and annual turnover. The organisational characteristics which define the internal environment of Nigerian construction SMEs include age, size, origin, geographical spread, number of employees, annual turnover, type of construction activities, company policies and growth rate of companies. The study covered safety issues concerning five core health and safety practices of construction SMEs. These practices are Company's Commitment, H&S Planning, Workers' Consultation & Participation, Communication and Education & Training. Six H&S regulations guiding the activities of construction SMEs were studied. These are health, safety

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and welfare provisions in: Public Health Act 1990; Workmen's Compensation Act; Factories Act 1990; National Environmental Standards and Regulation Enforcement Agency Act 2007; Labour, Safety and Welfare Bill 2012, and Conditions of Contract. Data collected on the organisational characteristics of construction companies covered a five-year period (2009 - 2013). The choice of a five-year period was for the study to be able to establish the companies' growth rate by size of workforce and by companies' annual turnover. One of the major limitations of the study was that some of the construction companies that do not abide by H&S rules seemed not to be willing to give honest answers to questions. Although this was addressed as much as possible by assuring the respondents that their responses will be treated confidentially. There is therefore the possibility that the level of implementing H&S practices by few of the small and medium-sized construction companies may be overstated in this study.

2.0 LITERATURE REVIEW

In order to be able to identify the research variables and main hypotheses required to put the work in the right context and to achieve the study's aim and objectives, an extant review of related literature was undertaken. This review of literature is summarised in this section.

2.1 Nature of H&S Management in the Construction Industry

In general term, health means a state of complete physical, emotional, mental, and social ability of an individual to cope with his environment, and not merely the absence of disease or infirmity (Hippocrates, 1981). Health is the art and science of preventing disease, prolonging life, promoting physical and mental health, sanitation and personal hygiene, control of infections and organisation of health services (Lucas, 2001; Akpan, 2011). On the other hand, safety means freedom from the occurrence or risk of injury or loss (Aswathappa, 2004; Akpan, 2011). Industrial or employee safety can therefore be referred to as the protection of workers from the danger of industrial accidents. Safety can as well be referred to as the absence of injuries due to the interaction of the employee and the work environment (Lucas, 2001). In a general perspective, safety means a condition of being safe from undergoing or causing hurt, injuries or loss. Hence, safety policies may encompass activities directed at either reducing or complete removal of hazardous conditions capable of causing bodily injuries. Organisational safety policy, according to Akpan

(2011), specifies the company's safety goals and designates the responsibilities and authority for their achievement. According to Akpan (2011), such policy statement must emphatically declare four fundamental points- (i) the safety of employees and the public: (ii) safety taking precedence over expediency: (iii) every effort made to involve all managers, supervisors and employees in the development and implementation of safety procedures: (iv) safety legislation to be complied with.

Awodele and Ayoola (2005) defined safety to denote certain rules and regulations given in the industry as a yardstick for protection from danger and harm while working on particular equipment or on the construction site. This proves beyond reasonable doubt that safety is essential in any industry and its importance cannot be over emphasised. In order to have a smooth safety performance on any project, it is therefore important for the government, contractor, and consultant/client to have a good and implementable safety programme. It was in this light that Awodele and Ayoola (2005) defined a safety programme as an outline of safety policies, project practice and procedures, and should provide actions that must be taken to regulate accidents and systematically integrate them into day-to-day management and operation of the company. Safety policy as further analysed by Awodele and Ayoola (2005) is a more detailed document containing the specific plans and procedures which should include, but not limited to the following: general safety policy, hazard assessment procedures, safe work practices & procedures, Personal Protective Equipment, maintenance policies & information, training policies, inspection policy, incidence investigation policies & information, emergency provisions among others. All these will have positive effects on occupational H&S behaviour of construction operatives.

2.2 The concept of Small and Medium-sized Enterprises (SMEs)
According to Small and Medium Enterprise Administration, Ministry of Economic Affairs (2013) in Taiwan, a SME shall refer to an enterprise that has completed company registration or business registration in accordance with the requirements of the law, and which conforms to the following criteria based on the Taiwan context:

1. In the manufacturing, construction, mining and quarrying industries, a paid-in capital of NT$80 million (US$2.42 million) or less.
2. In the agriculture, forestry and fisheries, water, electricity and gas, commercial, transportation, warehousing and communications, finance,

insurance and real estate, industrial and commercial services or social and personal services industries, sales revenue of NT$100 million (US$3.03 million) or less in the last year.

Depending on the nature of the business for which they are providing guidance, government agencies may base their definition of a SME on the number of regular employees as noted below:

1. In the manufacturing, construction, mining and quarrying industries, the number of regular employees must be less than 200.
2. For enterprises in the following industries, those enterprises with less than 100 regular employees are classed as small and medium enterprises: agriculture, forestry, fisheries and animal husbandry; water, electricity and gas; wholesaling and retailing; hotel and restaurant operation; transportation, warehousing and communications; finance and insurance; real estate and leasing; professional, scientific and technical services; educational services; medical, healthcare and social welfare services; cultural, sporting and leisure services; other service industries.
3. Micro enterprises refer to SMEs with fewer than 5 persons employed on a regular basis.

In the Nigerian context, Onugu (2005) gave the following definition to SMEs:

i. Micro Enterprise: A firm, whose total cost including working capital but excluding cost of land is not more than ten million naira (N10,000,000) and/or with a labour size of not more than thirty (30) full-time workers and/or a turnover of less than two million naira (N2,000,000) only.

ii. Small Enterprise: An enterprise whose total cost including working capital but excluding cost of land is between ten million naira (N10,000,000) and one hundred million naira (N100,000,000) and/or a workforce between eleven (11) and seventy (70) full-time staff and/or with a turnover of not more than ten million naira (N10,000,000) in a year.

iii. Medium Enterprise: A company with total cost including working capital but excluding cost of land of more than one hundred million naira (N100,000,000) but less than three hundred million naira (N300,000,000) and/or a staff strength of between seventy-one (71) and two hundred (200) full-time workers and/or with an annual turnover of not more than twenty million naira (N20,000,000) only.

iv. Large Enterprise: Any enterprise whose total cost including working capital but excluding cost of land is above three hundred-million-naira (N300,000,000) and/or a labour force of over two hundred (200) workers and/or an annual turnover of more than twenty million naira (N20,000,000) only.

Construction businesses in developing countries have unique characteristics that should be taken into account when defining the Small and Medium-sized Construction Companies (construction SMEs). Majority of contractors in developing countries (Koehn *et al*., 1995; Kheni *et al*., 2006), including Nigeria (Idoro, 2011), are SMEs and operate within domestic markets. These domestic construction businesses which operate within the domestic construction market are managed as family businesses, rarely employing up to 200 employees (Addo-Abedi, 1999). In line with this, the domestic construction contractors in Nigeria may, therefore, be conveniently regarded as SMEs based on the similar characteristics they possess. This study therefore defines SMEs as family run domestic contractors with the following thresholds relating to medium, small and micro construction businesses:

1. an upper threshold of 200 employees and a lower threshold of 71 employees are adopted for medium-sized construction businesses;
2. small businesses are ones which employ 31-70 persons; and
3. micro businesses are construction businesses whose number of employees does not exceed 30.

In summary, in the context of this study, construction SMEs were defined based on annual turnover and number of full-time employees based on the classification of Addo-Abedi (1999), Onugu (2005) and Idoro (2011).

2.3 Organisational Characteristics of Construction SMEs

According to Chinowsky *et al*. (2007) an organisation is the overall corporate entity of a company including all levels of management and staff personnel. Organisational characteristics are therefore the unique or distinguishing features which defines an organisation or a corporate entity. The organisational characteristics of construction companies are therefore the unique features which define the performance of the construction companies. Different researchers have used different parameters as organisational characteristics to define or determine the performance of construction firms (Okafor, 2007; Dada *et al.*, 2012; Odediran *et al*., 2012; Odediran *et al*., 2013). Based on the review of literature on these researches, this study adopted the

following variables to define the organisational characteristics of construction SMEs: Type of organisation; Years of experience; Type of business; Size of firm; Number of employees; Number of projects handled; Firm's annual turnover; Firm's growth rate; Origin of firms; and Geographical spread of firms.

2.4 H&S Practices Adopted by Construction SMEs for Controlling Risks of Hazards

Past researches have shown that certain practices can lead to improved H&S performance and therefore constitute good H&S practices. The findings of these researches as summarised from the review of literature in this study are presented in Table 1. Some H&S practices are required by H&S legislation to be implemented on construction sites in some countries. For instance, worker's involvement in H&S, training in H&S, and H&S committees, are covered by H&S regulations in the UK.

Table 1: Summary of Researches on H&S Management Practices (2008-2015)

Year and Authors	Summary of Research	Health and Safety Management Practices
Kheni (2008)	Identified factors associated with improved health and safety performance.	The following safety practices were identified: * high level of top management commitment; * health and safety responsibility known; * supervisor involvement encouraged; * active involvement of health and safety representatives who have a broad role; * effective health and safety committees; * planned identification of risk and hazard elimination/control emphasis; and, * comprehensive approach in inspections and investigations.
Idoro (2011)	Studied the influence of mechanization on OHS performance of the Nigerian Construction Industry.	The study recommended that: * stakeholders should give more attention to OHS management plan; and, *hazard management plan in the use of plant and equipment on site should be given more priority.
Agwu (2012(a))	Studied the implications of integrating safety and social responsibility initiatives at the organizational level in the Nigerian construction industry.	The following were suggested as factors linking safety and social responsibility: * the use of ISO 26000; *holding top management accountable for safety; and, * communicating safety value to corporate stakeholders.
Agwu (2012(b))	Assessed the impact of employees' safety culture on organisational performance.	The following factors improving employees safety performance were identified: * visibility of management commitment to construction employees' safety culture; * establishment of monthly

		safety incentive schemes for employees; * training and retraining of employees on safe work procedure; * increase in site safety audits; and, * focusing on monthly safety meetings on employees' attitudinal change towards safety.
Belel and Mahmud (2012)	Studied safety culture of Nigerian construction workers in Yola.	It was discovered that: * Construction workers' attitude towards safety is influenced by their perception of risk, safety rules and procedures. * Lack of training of workers was ranked the most severe factor that hinders workers' safety on site. * Reduce accident cost was ranked the most important benefit of safety on site.
Okolie and Okoye (2012)	Assed the impact of national culture on the safety climate of construction workers in South-East, Nigeria.	Four cultural factors were identified as enhancing positive behaviour of construction workers. These are: * Long Vs Small power distance; * Individualism Vs Collectivism; * Strong Vs Weak uncertainty avoidance; and, * Masculinity Vs Femininity.
Idubor and Oisamoje (2013)	Examined background of OHS practices in Nigeria by highlighting the importance of mitigating OHS challenges identified from moral, legal and financial dimensions.	Reasons for frequent violation of OHS standards and norms by the operators in Nigeria were identified as: * bribery and corruption in the system; * the Nigerian factor; * inadequate funding of monitoring institutions; * low level education of employees; and* Problems of unemployment.
Agumba and Haupt (2014)	Examined the validity and reliability of health and safety practices and respondents' demographic attributes perception on these health and safety practices implementation of South African construction SMEs.	It was established that health and safety practices were valid for construction SMEs. It was also discovered that the number of years (experience) of employers/employees in an organisation and perception towards health and safety did not differ, while educational level of employer/employee in an organisation and perception towards health and safety differed.
Okoye and Okolie (2014)	Assed the cost of health and safety performance of building contractors in Nigeria.	It was concluded that health and safety performance of contractors affect success of building projects in terms of delivery time, quality, cost and productivity.
Shittu et. al. (2015)	Carried out an appraisal of health and safety practices of construction SMEs in Abuja.	60 safety practices were identified under 6 core practices. These are company's commitment, workers consultation and participation, health and safety planning, monitoring & review, communication and education & training.

Source: Author's Compilation (2015)

From the review of the H&S management practices in the construction industry carried out in the previous section, the practices capable of enhancing good H&S performance in the Nigerian construction industry are summarised in Table 2.

Table 2: Health and Safety Management Practices of Construction SMEs

S/No	H&S PRACTICES OF CONSTRUCTION SMEs	CONTEXT	S/No	HEALTH AND SAFETY PRACTICES OF CONSTRUCTION SMEs	CONTEXT
1	Accident and nearmiss investigation	Company commitment	30	Provision of cafeteria	Company commitment
2	Safety record keeping and follow-ups	Company commitment	31	Provision of changing/rest room	Company commitment
3	Effective safety committee	Company commitment	32	Safety meetings	Communication
4	Control of subcontractors	Company commitment	33	Communicating safety value to corporate stakeholders and Two-way safety communication	Communication
5	Top management involvement	Company commitment	34	Focusing of monthly safety meetings on employees' attitudinal change towards safety	Communication
6	Adequate work space and neat environment	Company commitment	35	Use of posters and other signs to give safety education	Communication
7	Safety person or personnel	Company commitment	36	Safety inductions	Education and training
8	Safety policies and procedures	Company commitment	37	Safety training and orientations	Education and training
9	Fire protection programme	Company commitment	38	Alcohol- and substance-abuse programme	Education and training
10	Detailed safety programmes	Company commitment	39	Training and retraining of employees on safe work procedure	Education and training
11	Expended large percentage of revenue on safety performance	Company commitment	40	Job hazard analysis	Health and safety planning

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12	Health and safety responsibility known	Company commitment	41	Safety pre-task planning	Health and safety planning
13	Encouragement of supervisor involvement	Company commitment	42	Accountability/responsibility and safety budget	Health and safety planning
14	Use of more directly employed labour	Company commitment	43	Effective identification and hazard elimination/control	Health and safety planning
15	Minimization of cost of ill-health and injury	Company commitment	44	Post-accident investigation	Health and safety planning
16	Desire to improve staff morale and productivity	Company commitment	45	Compliance with customer or regular certification schemes	Health and safety planning
17	Minimization of workers' turnover	Company commitment	46	Regulatory enforcement activity	Health and safety planning
18	Implementing employee drug testing	Company commitment	47	Hazard management plan in use of plant and equipment	Health and safety planning
19	Use of external assistance with respect to health and safety issues	Company commitment	48	Emergency response plan	Health and safety planning
20	Use of ISO 26000	Company commitment	49	Employer-paid group insurance plan	Health and safety planning
21	Increase in safety auditing	Company commitment	50	Jobsite inspection	Health and safety planning
22	Recognizing unique needs of members of the organization	Company commitment	51	Formal safety inspection per month	Health and safety planning
23	Provision of Personal Protective Equipment (PPE)	Company commitment	52	Holding management accountable for health and safety	Health and safety planning
24	Provision of first aid facilities on site	Company commitment	53	Safety incentives	Worker consultation and participation
25	Mobile clinic	Company commitment	54	Higher average wage of workers	Worker consultation and participation
26	Fencing of sites	Company commitment	55	Longer average length of employment	Worker consultation and participation

27	Provision of transport for workers	Company commitment	56	Higher percentage of married workers	Worker consultation and participation
28	Provision of drinking water	Company commitment	57	Safety reward	Worker consultation and participation
29	Provision of toilet	Company commitment	58	Workers' involvement	Worker consultation and participation

Source: Author's Compilation (2015)

Table 2 shows that the identified H&S management practices adopted by the Nigerian construction SMEs in minimising the risks of accidents on construction sites are 58. Thirty-one (31) are in the context of company's commitment; four (4) are in the context of communication, another four (4) are in the context of education & training; thirteen (13) are in the context of H&S planning; and six (6) are in the context of worker's consultation & participation. The identified H&S management practices of the Nigerian construction SMEs are therefore categorised under five (5) major contexts.

2.5 Relationship between Organisational Characteristics and H&S Practices of Construction SMEs

In a study to examine the influence of the contextual environment within which Ghanaian construction small- and medium-sized enterprises SMEs manage occupational health and safety, Kheni *et al.* (2010) identified low literacy levels, low socioeconomic status of workers, owner/managers' ignorance of their Occupational Health and Safety (OH&S) responsibilities, commitment to extended family obligations, and ineffective OH&S administration as key factors limiting the capacity of construction SMEs to manage OH&S effectively. Kheni *et al.* (2010) therefore concluded that effective institutional structure and an enabling socioeconomic environment are needed to enhance the OH&S performance of construction SMEs and advocates for more proactive OH&S management that take into consideration the work cultures of SMEs.

According to Masood and Choudhry (2012), demographic factors such as age, educational level, experience, marital status, dependents, employment status and habits have influenced workers" safety perceptions. Perceptions portray the psychological construct of safety culture, which is safety climate, which needs to be

clear and positive. Safety climate as pivotal construct (perceptual) of safety culture shared common grounds as beliefs, values and attitudes for safety. Masood and Choudhry (2012) added that improvements in working conditions and innovations in the equipment used in the industry are not enough to improve safety performance because organisational culture and human factors also play critical roles. Safety culture is therefore becoming critically important to the safety of employees on construction sites and considering area of interest for researchers in recent years because of variation in workforce" behaviour which is based on perceptions (safety climate). Safety practices in world constructions industries are unique due to demographics, legislation and stakeholders' contractual agreements.

Twenty-eight (28) factors were identified by Amoah *et al*. (2012) to be affecting construction performance in Ghana. Nineteen (19) factors were summarised out of these factors and the 19 were further categorised in to two groups. These 19 factors are availability of training proprietors and technicians; ability to delegate responsibility; availability of materials and equipment; availability of technology; existence of labour and labour unions; execution of other projects; weather conditions; Government policies; competition from other contractors; other professionals; traders' skills; health and safety consciousness; ability to work as a team and coordinate; client satisfaction; access to finance; interest rate; interim payments; honouring of payment certificates; and communication. The findings of Amoah *et al.* (2012) suggested that the above factors affecting the performance of Small-Scale Building Contractors (SSBCs) could be classified into two main groups, namely, Fiscal Policy and Managerial Capacity-Related. It was therefore concluded that the issue of governmental fiscal policy is striking, given the long-held belief among some industry analysts that the Government of Ghana is not doing enough to create the enabling fiscal environment for the activities of the SSBCs to strive and that SSBCs are admitting to their own managerial inadequacies as potential source of poor performance in the sector. It was then recommended that given the threat of global competition, it is vital that the Government of Ghana is pragmatic in creating robust policies that will help strengthen the financial and managerial capacity of SSBCs, towards stimulating accelerated development of the sector.

There are certain prerequisites for any country to industrialise successfully. Economic theorists have listed these as a stable government, a very productive agricultural sector, functioning markets, and a large capable workforce.

Surprisingly, these characteristics are largely lacking in Nigeria (Idubor & Oisamoje, 2013). Idubor and Oisamoje (2013) stated further that Nigeria as a country is trying very hard to become industrialised but does not display most of the qualities of an industrialising country as spelt out above because, as an industrialising country, Nigeria relies to a disturbing extent very heavily on foreign investments, some of which come in the form of manufacturing businesses promoted by foreign companies. Many of such companies are attracted to operate in Nigeria for a number of reasons. These reasons amongst others include: the large cheap labour market, an abundance of natural resources, a huge market for their finished products, the weak legal structure and the lack of strict enforcement of H&S measures, which enables heinous violations of those measures. The process of industrialisation comes with some peculiar problems that if not properly tackled can cause damage not only to the environment but to the workers as well. The fact however remains that as much as a country seeks to be industrialised, structures and legislations should be put in place and enforced to ensure that the health and safety of workers are not compromised. While it may be true that organisations exist for the major purpose of making profit in the long run, they have also come to realise that the health, safety and welfare of their employees cannot be separated from their continued effective existence. Hence organisations are taking more interest in the welfare of their employees not only as a means of protecting their profit line but also because certain laws have been put in place to ensure that organisations provide their employees with a safe environment within which to work.

In the contributions of Lingard and Rowlinson (1994), it was reported that construction site safety is a complex problem and poor safety performance cannot be attributed to one cause alone. In this regard, at least six key areas affecting site safety can be identified as: the context of construction industry; education and training; legislation and its enforcement; licensing and certification of plant operators; clients' reaction to safety performance; and insurance policies. Idubor and Oisamoje (2013), on the other hand, identified 22 contextual factors influencing H&S Management Practices of construction employees. These are Moral and Legal Responsibility of Employers; Economic Reasons; Employee Suffering; Legal Sanctions; Occupational Health and Safety Legislation in Nigeria; Employers' Duties and Responsibilities; Occupational Health and Safety Violations in Nigeria; Lack of Strict Judicial References; Weak Legal Structures; Corruption and Bribery;

Lack of Corporate Responsibility and Accountability; Low Educational Level of the Workforce; Unemployment; Repressive and Undemocratic Human Rights Records; Weak National Occupational Health and Safety Standard; Lack of Political Will (The Nigeria Factor); Lack of Adequate Information and Statistics; Cost of doing Business in Nigeria; Cultural Dimension; Shortage of Professional Labour; Inadequate Training of Staff; and Funding Challenges. From the factors influencing occupational H&S management practices of construction workers in Nigeria identified, Idubor and Oisamoje (2013) suggested that something needs to done and urgently because managing a healthy workforce is beneficial to all stakeholders, including government. The onus is therefore on Government, various regulatory bodies, Employees' unions or representatives, and employers of labour to brainstorm on the way forward and to be totally committed to effecting meaningful changes in the occupational health and management environment. Windapo and Jegede (2013) also recommended that small and medium-sized construction companies should institute a company Health, Safety and Environment (HSE) policy and monitor its application on their sites.

In view of the above background, this study formulated the following hypotheses so as to be able to determine the relationship between organisational characteristics and H&S management practices of construction SMEs in Nigeria:

H_01: There is no significant relationship between companies' age and H&S practices of construction SMEs.

H_02: There is no significant relationship between companies' size and H&S practices.

H_03: There is no significant relationship between experience of safety supervisors and H&S practices.

H_04: There is no significant relationship between construction type and H&S practices.

H_05: There is no significant relationship between companies' annual turnover and H&S practices.

H_06: There is no significant relationship between companies' average annual growth rate and H&S practices.

3.0 RESEARCH METHODOLOGY

This section gives a detailed discussion on the ways in which the work of the study was undertaken so as to achieve the aim and objectives of the research. Detailed

discussions on the paradigms that necessitate the underlying philosophical assumptions and the various strategies of research available and could be adopted as means of addressing specific research problems are discussed. In addition, this section discussed the procedure for data collection and analysis.

3.1 Research Philosophy

Research philosophy can be viewed better as a broad approach to examining a research problem than a methodological design. It involves philosophical analysis and argumentation intended to challenge deeply embedded, often intractable, assumptions underpinning an area of study (Maykut, 1994; Labaree & Ross, 2008). Research philosophy employs argumentation tools derived from philosophical traditions, concepts, and theories to critically explore and challenge, for example, the relevance of logic and evidence in academic debates, to analyse arguments about fundamental issues, or to discuss the root of existing discourse about a research problem. These important analytical tools can be framed under three paradigms: Ontology -- the study that describes the nature of reality; for example, what is real and what is not, what is fundamental and what is derivative?; Epistemology -- the study that explores the nature of knowledge; for example, on what does knowledge and understanding depend upon and how can we be certain of what we know?; and Axiology -- the study of values; for example, what values does an individual or group hold and why? How are values related to interest, desire, will, experience, and means-to-end? And, what is the difference between a matter of fact and a matter of value? In view of the nature of this study which deals with H&S practices of construction SMEs, a research philosophy which will give room for adequate data collection and follow-up on the reliability of data is required. As a result of this, the study was based on the combination of the above paradigms (ontology, epistemology and axiology philosophical consideration) to address the problem identified by the study.

3.2 Research Design for the Study

The researh design comprises of concepts, theories or models which provide the starting point for social researches. These theories, which are abstractions from reality, are usually normative – describing the world as it ought to be – or positive – describing the world as it is. Research designs help to simplify reality by providing the framework within which problems could be solved. According to Morenikeji

(2006) every research topic needs to be related to an existing body of theory and the findings need not conform with theory. Theories in socal science, no matter how interesting, are only tools for explanations and need not exactly replicate reality. Theories are nevertheless very essential to organise or structure out ways of thinking. Departure of findings from known theory, concept or model will excite fresh enquiry or lead to further explanations to account for the observed variations. In view of these, the research design for this study was adapted from the study of Kheni (2008) which involved a muti-paradigmatic position argued to follow from the context of the study (small and medium-sized construction companies) and the diversity of information needed to give clear perspetive of health and safety management. The major difference between the research design for this study and that of Kheni (2008) is that this study did not make use of interviews for data collection because the pilot study showed that data from questionnaires were adequate for the study.

In order to be able to reach out to the respondents who are small and medium-sized companies (construction SMEs), the list containing their comprehensive contact details was obtained from Corporate Affaisrs Commission (CAC), Abuja. Formal, semi-formal and informal meetings were held with the owner/managers of the construction SMEs in order to create an effectve means for data collection in the study area. In order to also appreciate the task of data collection and authenticity of data collected through the questionnaires, observations were made to sites to take records of the actual H&S practices on construction sites.

The field work for the study was carried out in three phases. The first phase involved the conduct of pilot study (in 2 stages) comprising of 40 purposefully selected construction SMEs. The first stage of the pilot study was undertaken to identify constraints to proper management of health and safety on construction sites and the the important H&S practices required for improving H&S performance of construction SMEs. The second stage of the pilot study was carried out to identify the possible link between organisational characteristics and H&S management practices of construction SMEs. This was done in order to establish a good basis for the formulation of hypotheses which summarise the relationship between organisational characteristics H&S management practices of construction SMEs. The second phase involved the main survey with the use of questionnaires to collect data from 436 randomly selected construction SMEs. The third phase involved visit to the construction sites of 21 construction SMEs that took part in the pilot study.

This phase also involved data collection through site observations, documentary sources and visual devices. Figure 1 is the conceptual framework which gives a summary of the research design for the study.

3.3 Research Population, Sample Frame and Sample Size

The population for the study constitutes the number of construction SMEs registered with Abuja's business addresses with CAC in Abuja. This population size was 2219. The sample frame for the study was the list obtained from CAC Headquarters, Abuja, which shows the population characteristics. Abuja was chosen as the study area because it is the capital city of Nigeria where both indigenous and multinational construction companies execute most of their projects in Nigeria (Kadiri e*t al.,* 2014). This is because a reasonable number of construction activities take place there. This was due to the fact that Abuja experiences rapid population increase and new developmental projects daily as a result of rapid urbanisation and rural-urban migration. This leads to constant increase in demand for shelter for both residential and commercial purposes.

Watson (2001) reported that if your population is small (200 people or less), it may be preferable to do a census of everyone in the population, rather than draw a sample. For a marginally higher population than a 134-person sample, you can survey the entire population and gain a 0% sampling error. If the population from which you want to gather information is, however larger, it makes sense to do a sample. According to Watson (2001) there is no set percentage that is accurate for every population but what matters is the actual number or size of the sample. The base sample size is the number of responses you must get back when you conduct your survey. However, since not everyone will respond, you will need to increase your sample size, and perhaps the number of contacts you attempt to account for these non-responses. In the light of this, Watson (2001) reported that after a researcher has come up with an estimate of the percentage expected to respond, then the base sample size can be divided by the percentage of response. Based on this, Watson (2001) gave the formula below for determining the sample size of a research and this was adopted in this study.

$$n = [\ P(1-P)\ /\{A^2/Z^2\} + \{P(1-P)/N\}] \div R \ \text{-------------------------------} \ (2)$$

Where: n = sample size required, N = number of samples in the population; P = estimated variance in population, as a decimal: (i.e., 0.5 for this study); A = Precision desired, expressed as a decimal (i.e., 0.05 for 5% used in this study); Z = Based on

confidence level: 1.96 for 95% confidence was used for this study; and R = Estimated Response rate, as a decimal (75% i.e., 0.75)

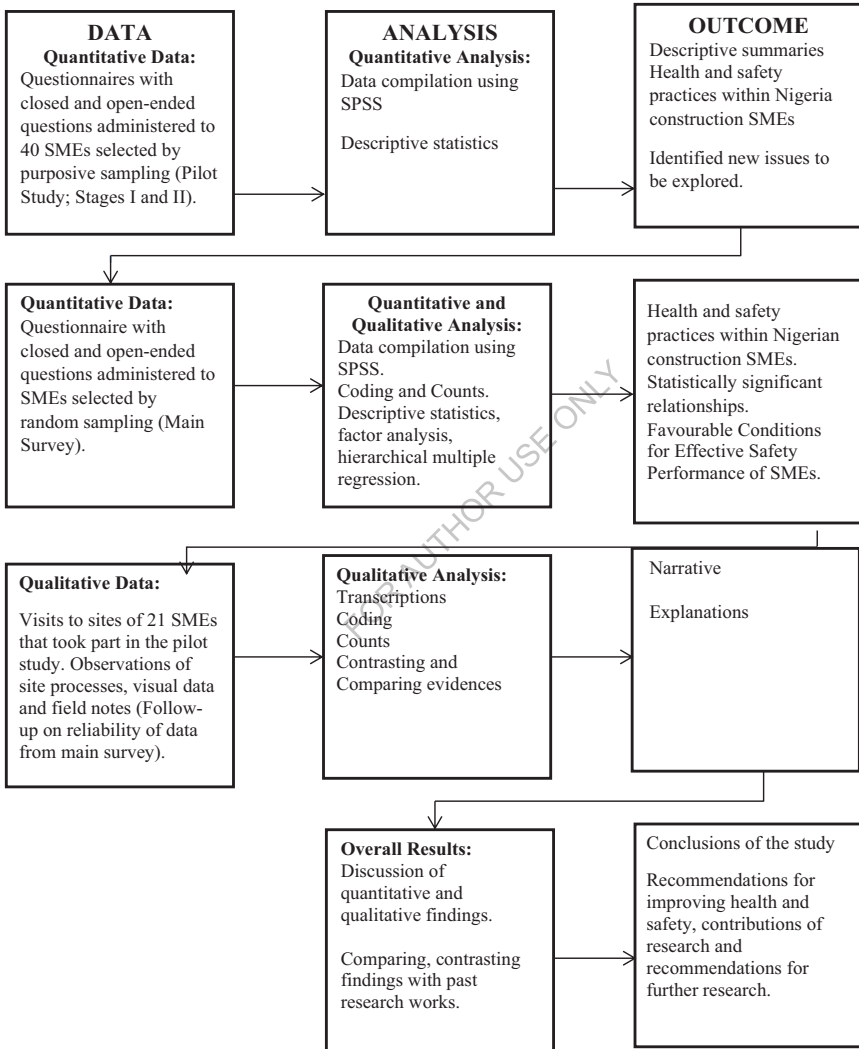The sample size for this research based on equation (2) above is therefore 436.

DATA	**ANALYSIS**	**OUTCOME**
Quantitative Data: Questionnaires with closed and open-ended questions administered to 40 SMEs selected by purposive sampling (Pilot Study; Stages I and II).	**Quantitative Analysis:** Data compilation using SPSS Descriptive statistics	Descriptive summaries Health and safety practices within Nigeria construction SMEs Identified new issues to be explored.
Quantitative Data: Questionnaire with closed and open-ended questions administered to SMEs selected by random sampling (Main Survey).	**Quantitative and Qualitative Analysis:** Data compilation using SPSS. Coding and Counts. Descriptive statistics, factor analysis, hierarchical multiple regression.	Health and safety practices within Nigerian construction SMEs. Statistically significant relationships. Favourable Conditions for Effective Safety Performance of SMEs.
Qualitative Data: Visits to sites of 21 SMEs that took part in the pilot study. Observations of site processes, visual data and field notes (Follow-up on reliability of data from main survey).	**Qualitative Analysis:** Transcriptions Coding Counts Contrasting and Comparing evidences	Narrative Explanations
	Overall Results: Discussion of quantitative and qualitative findings. Comparing, contrasting findings with past research works.	Conclusions of the study Recommendations for improving health and safety, contributions of research and recommendations for further research.

Fig. 1: Conceptual Framework for the Study

3.4 Sampling Technique

Sampling technique is the process of obtaining information about an entire population by examining only a part of it (Morenikeji, 2006; Nagaya, 2010; Haque, 2013). In most of the research work and surveys the usual approach happens to be making generalisation or drawing inferences based on samples about the parameters of population from which the samples are taken. A sample can now be defined as any number of persons, units or objects selected to represent the population according to some rule or plan. Sampling is therefore the method of selecting a fraction of the population in such a way that it represents the whole population. The sampling approach adopted for the study involved two methods of sampling. The first method involved the use of random sampling technique for selecting members (respondents) from the list of registered construction companies in Abuja obtained from CAC and administering survey questionnaires to them. The random sampling technique was used in order to have an unbiased selection and give the elements in the population equal chances of being chosen. The second reason was to get a representative number from the population size as the sample size to be used for the main study. This was used for the main fieldwork. The second method involved the use of purposive sampling technique for the selection of construction companies that participated in the pilot study and whose sites were visited. This technique was used because the fieldwork here involved a pilot study and site observations used as follow-up to data collection from the main survey. As a result of the time-consuming nature of site observations, only few samples were required and these samples were drawn using purposive sampling technique from the construction SMEs who took part in the pilot study.

3.5 Procedure for Data Collection

This study employed the use of semi-strutured questionnaire which comprises the closed and open ended questions format to collect data. In order to verify the quality of the questionnaire developed for the study, the questionnaire was pilot-tested (pre-testing) by sending it to ten (10) construction SMEs. See Appendix A for a copy of the Pilot Questionnaire. This was done because it was reported by Morenikeji (2006) that the quality of a questionnaire can be verified through a pre-testing exercise in order to reveal omissions and questions liable to misinterpretation. The final questionnaire developed had no fundamental changes. The only changes made were on questions 2 and 3 (number of employees) which were changed from specific data

to grouped data options for the respondents to thick (see Appendix B). This was because it was noted that majority of the respondents refused to answer these questions. The final questionnaire involved the closed-ended questions (dichotomous, and multiple choice) along with open-ended questions (see Appendix C).

The questionnaire was divided into two sections. The first and second sections of the questionnaire contained questions on profiles of construction SMEs (e.g., experience, position of respondent, and characteristics of respondents' businesses such as telephone number(s), address, type of work the business undertakes, number of employees, year of establishment of the business, the type of contractor association, growth rate of the SME over the last five years and turnover). The information in this section gave detailed account of the organisational characteristics of construction SMEs which is the major issue of study. The third section contained responses on the health and safety management practices of the owner/managers of the construction SMEs. This section is also essential because it contains fundamental information on the procedures for managing health and safety activities on sites by the construction SMEs. The information here was also crucial towards addressing the research problem. The fourth section also contained open-ended questions on constraints the construction companies faced in the management of health and safety and suggestions for improving health and safety on construction sites. This section is required because it assisted in identifying reasons for the poor performance of construction SMEs and best ways of proffering solutions to the research problem. The questions in the questionnaires were all crucial to the achievement of the aim and objectives of the study.

Data collection for the study covered the six Area councils in Abuja. Four field assistants were co-opted in to the field work. The field assistants were chosen on the basis of having a minimum of Bachelor's Degree in the built environment courses. Rigorous training was held to sensitise the field assistants on how to administer questionnaire and how to ask questions during site visits. Each of the field assistants covered an Area Council while the researcher covered two Area Councils. Visits to construction sites were undertaken based on a research committee level. Each of the committee consisted of the researcher and two field assistants at every visit. Few of the sites were visited with the field assistants during the pilot study in order to

prepare for the main fieldwork. Some of the questionnaires were administered by post, while some were self – administered.

3.6 Method of Data Analysis

The study employed the use of both descriptive and inferential methods of analysis to analyse the collected data in order to achieve the objectives. Data presentation was done using tables and bar charts. In order to achieve the first, second and third objectives of the study, the main organisational characteristics of the Nigerian construction SMEs which define the internal contextual environment within which the construction SMEs operate; the health and safety management practices adopted by the Nigerian construction SMEs in controlling the risks of hazards on construction sites; and the main health and safety regulations guiding the activities of Nigerian construction SMEs were identified from extensive review of literature. Mean Item Score (MIS) and Standard Deviation were used to rank the health and safety practices by the construction SMEs in order of importance on a 5 – point scale: 1 – Least Important; 2 – Less Important; 3 – Undecided; 4 – Important; 5 – Most Important. MIS was used to assess the level of implementation of the important health and safety practices by the construction SMEs on a 3 – point scale: 1 – Not at all; 2 – Partially; 3 – Completely. The identified H&S regulations guiding the activities of Nigerian construction SMEs were thereafter also ranked in order of compliance with the use of MIS and Standard Deviation on a   3 – point scale. These helped to fully achieve the second and third objectives respectively. The number of questionnaires distributed was 436 out of which 204 were found to be useful for analysis. The 204 questionnaires were added to the 31 useable questionnaires from the pilot survey giving a total of 235 questionnaires. The overall response rate of 49.37% was therefore achieved as shown in Table 3.

Table 3: Response Rate for the Study

	No. Distributed	No. Received	Response Rate (%)
Pilot Survey	40	31	77.50
Main Survey	436	204	46.79
TOTAL	476	235	49.37

Ankrah (2007) who had a response rate of 15.42% reported that the response rate norm for postal questionnaire surveys is 20 – 30%. Others are Hung (2003), Kheni (2008) and Ikpe (2009) with response rates of 7.3%, 32.42% and 15.8% respectively. In addition, 15.72% was the response rate in the study of Agumba and Haupt where

questionnaires were both self – administered and administered by mail. This justifies that the response rate in this study is adequate. The combination of the pilot and main survey responses was considered acceptable because the projects studied in both cases were in the same study area and only two questions were modified following the pilot study. This therefore implies that to a large extent the instrument used in both cases was the same. The whole questionnaires had been sufficiently completed and they were all included in the analyses that were subsequently carried out.

The use of MIS was employed because it was necessary to identify the important H&S practices adopted by the construction SMEs. Equation 1 gives the formula for computing the MIS used to identify the important health and safety practices on a five-point Likert's Scale with the aid of Microsoft Excel software.

$$MIS = \frac{\sum f(x)}{\sum f} \text{------------ (1)}$$

Where;

f = Number of respondents for the attribute rated scale (1, 2, 3, 4 or 5)

x = Observed Value or rated scale (1, 2, 3, 4 or 5)

f(x) = Product of number of respondents for attribute rated scale and observed value

$\sum f(x)$ = Number of respondents for the attribute rated 3 on scale used

$\sum f$ = Total number of Respondents

Table 4 gives the decision rule adopted to determine the level of importance of the health and safety practices.

Table 4: Decision Rule for Ranking Health and Safety Practices

SCALE	MIS	Decision/Remark
1	4.50 to 5.00	Very Important
2	3.50 to 4.49	Important
3	2.50 to 3.49	Less Important
4	1.50 to 2.49	Least Important
5	0.00 to 1.49	Not Important

The choice of 3.50 – 5.00 as the cut-off point for the important H&S practices were as a result of the fact that H&S, being a crucial issue to the successful completion of a project, requires best practices in order to bring about improved performance.

Based on the scale used (1 - 5), best H&S practices should be far above average. In addition, in the study of Agumba and Haupt (2014) the mean score of the identified important H&S practices ranged between 3.80 and 4.60. This justifies the choice of 3.50 – 5.00 as the cut-off point for the important H&S practices in the study.

The types of inferential statistics used in the study were Factor Analysis (FA) and Hierarchical Multiple Regression (HMR) analysis. Factor analysis was used in order to reduce the 46 H&S management practices and the H&S regulations identified from the review of literature in this study to nine major H&S management practices/regulations. This was done in order to reduce each of the important core H&S practices which had many practices under it to a manageable size suitable for further analysis. The reduced H&S practices were used for further analysis to explore the relationship between organisational characteristics (years of experience of employees, age of firm, number of employees, annual turnover of firm, firms' growth rate from employees' number (Growth Rate by Size) and firms' growth rate from annual turnover (Growth Rate by Turnover)) and the nine set of health and safety management practices/regulations (domestic health and safety practices of firms, practices given as provisions in conditions of contract, use of outside health and safety consultants, workers' consultation and participation, health and safety communication, pre-contract H&S panning, contract H&S planning, H&S education and training, and H&S regulations) explored. This further analysis was carried out using HMR analysis. Multiple regression is an extension of simple (bi-variate) regression. The goal of multiple regression is to enable a researcher to assess the relationship between a dependent (predicted) variable and several independent (predictor) variables. The end result of multiple regression is the development of a regression equation (line of best fit) between the dependent variable and several independent variables. This equation is defined by the formula presented as Equation 2.

$$y \quad = \quad \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + ... \qquad (+ \varepsilon) \text{----------------------------- (2)}$$

where:

y	=	dependent variable
x_1, x_2, x_3	=	independent variables
β_0	=	y-intercept
$\beta_1, \beta_2, \beta_3$	=	parameters relating x's to y

According to Pallant (2013) multiple regression is one of the fussier of the statistical techniques which makes a number of assumptions about the data, and it is not the technique to use on small samples, where the distribution of scores is very skewed. This makes it suitable and was adopted for this study. Pallant (2013) added that it is important to carryout series of tests to determine the suitability of multiple regression analysis for particular research before commencing the use of multiple regression analysis. In the light of this, the following tests were carried out to confirm the suitability of the data in this study for multiple regression analysis:

1. Normality test by inspecting the Normal Probability Plot (P-P) of the Regression Standardised Residual and the Scatterplot.
2. Linearity test by inspecting the Normal Probability Plot (P-P) of the Regression Standardised Residual and the Scatterplot.
3. Multicollinearaity test by inspecting the Normal Probability Plot (P-P) of the Regression Standardised Residual and the Scatterplot.
4. Homoscedasticity test by inspecting the Normal Probability Plot (P-P) of the Regression Standardised Residual and the Scatterplot.
5. Outliers Test by inspecting the Scatter plot and Mahalanobis distances produced by the multiple regression program.

The result obtained from HMR analysis with the analyses of the findings from site observations assisted in achieving the third objective of the study which was to establish the relationship between organisational characteristics on the H&S management practices of Nigerian construction SMEs. This in turn formed a basis for determining favourable conditions for effective safety performance of Nigerian construction SMEs with the use of mean ranking of the level of implementation of the H&S practices which was done using a scale of 1 – 3 (1 = Not Implemented; 2 = Partially Implemented; 3 = Completely Implemented). The study's recommendations were based on the research findings.

4.0 RESULTS AND DISCUSSION
This section presents and discusses the results of the survey carried out in this study.

4.1 Results and Discussion on Organisational Characteristics Influencing Activities of Construction SMEs in Abuja, Nigeria
Figure 2 shows the range of years of experience of the respondents (owner/managers or safety supervisor). It was discovered that most of the respondents (69%) have had

between 1 and 15 years of experience at the construction companies. This implies that the respondents were suitable to provide accurate answers to the questions in the research questionnaire.
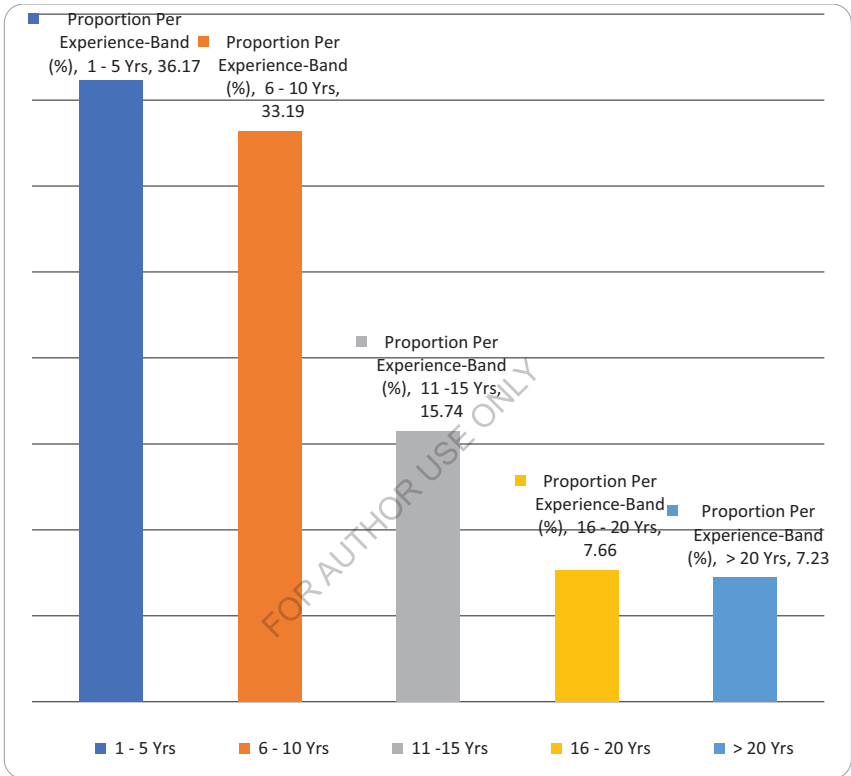

Fig. 2: Experience of Owner/Managers or Safety Officers of Construction Companies

It was revealed from Figure 3 that majority of the companies (62%) have being in existence for more than 10 years. This implies that the companies were suitable and old enough to provide accurate response to the questionnaire.
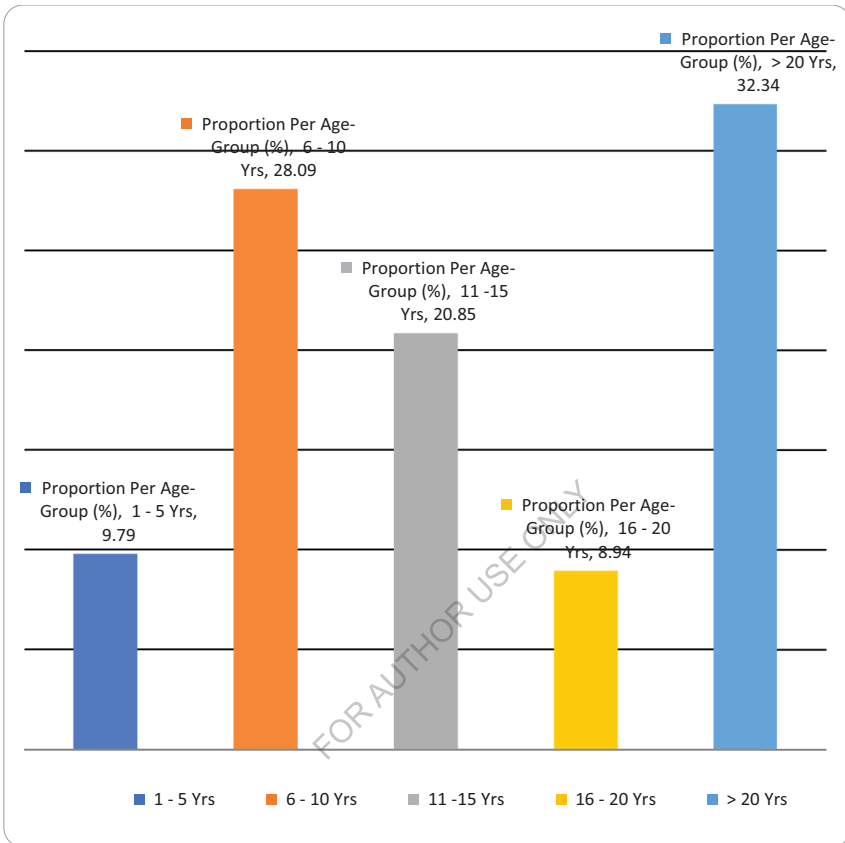
Fig. 3: Range of the Age-Band of Construction Companies

Figure 4 reveals that the about 70% of the construction companies undertake a combination of building and civil engineering construction works, with a higher proportion of building construction works. This indicates that, on the average, the construction companies predominantly undertake building construction works.
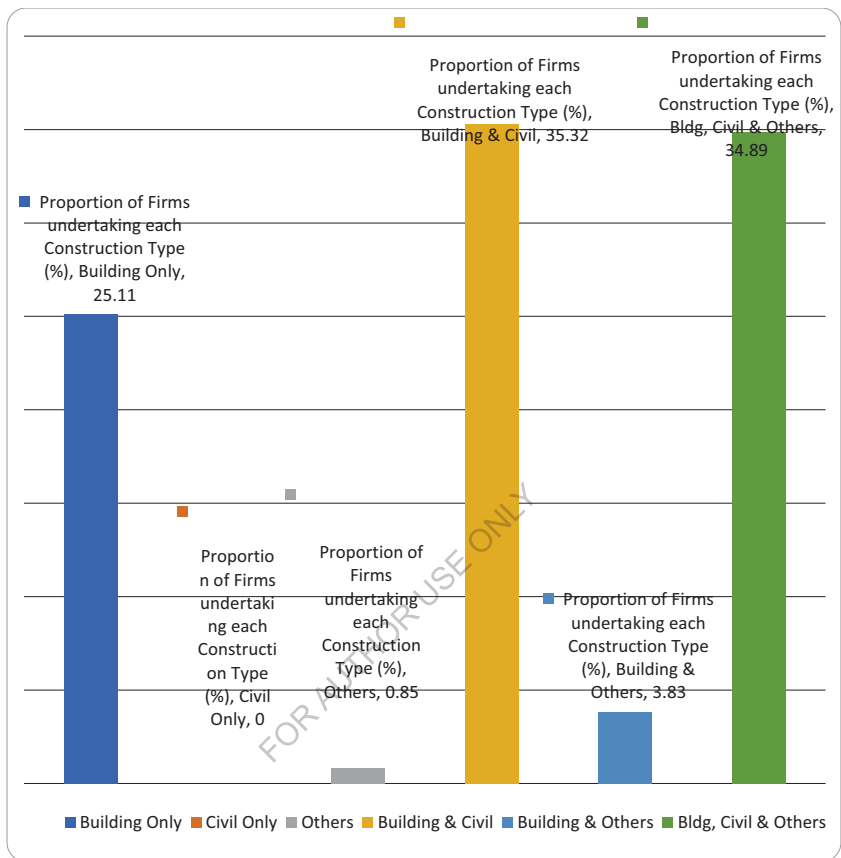
Fig. 4: Types of Construction Works undertaken by Construction Companies

Figure 5 shows the average annual turnover range of the construction companies for a five-year period (2009 – 2013). It was revealed that the average annual turnover of construction companies for the period ranged between less than =N= 2,000,000.00 and - =N= 20,000,000.00. This indicates that the construction companies are small and medium-sized companies and therefore suitable for the study.
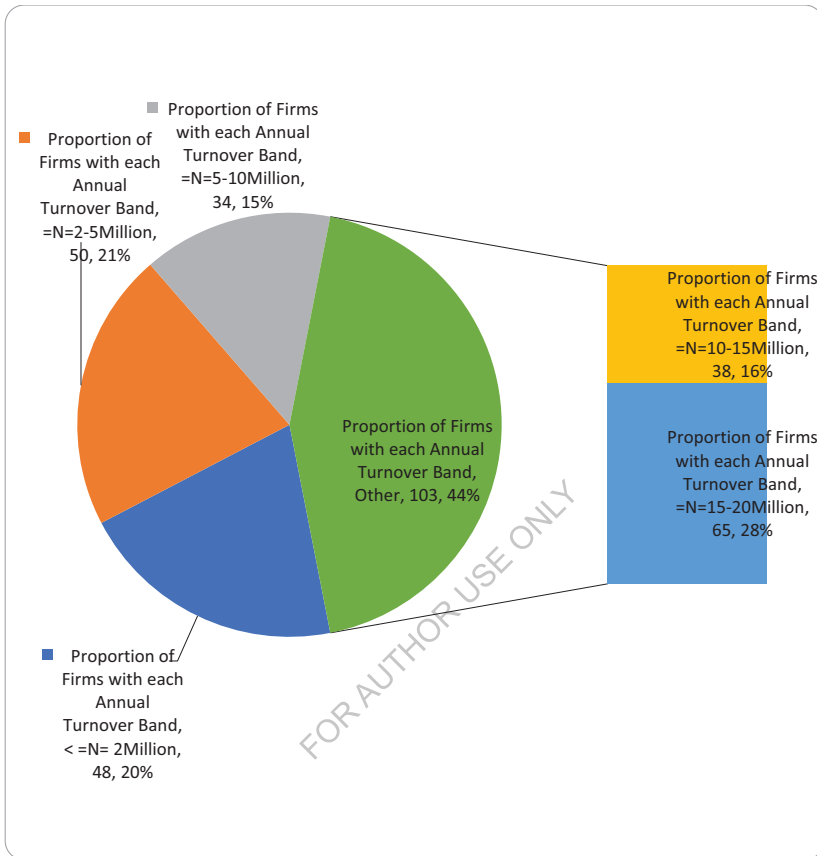
Fig. 5: Companies Average Annual Turnover from 2009 – 2013

Figure 6 shows that less than 70% of the respondents belonged to one contractors' association or the other, 31% does not belong to any of the contractor's associations. This indicates that a sizeable proportion of the construction SMEs does not belong to any of the contractor's associations. This may be responsible for the poor health and safety performance of some of the construction SMEs.
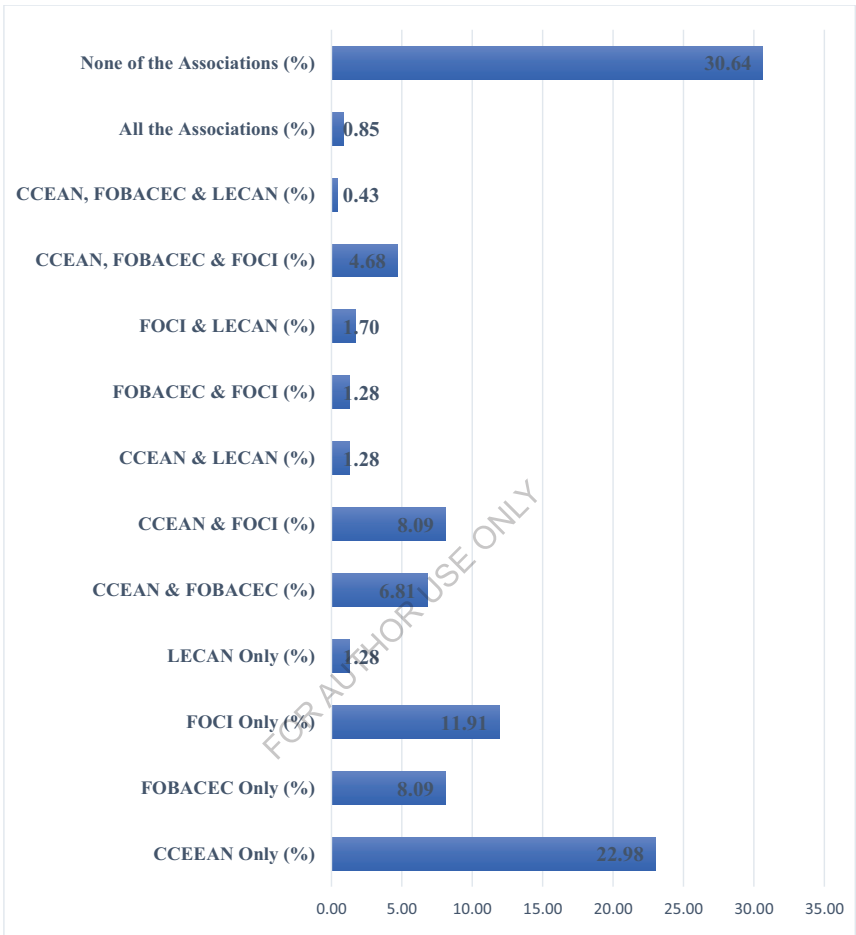
Fig. 6: Proportion of Firms belonging to Each & Combination of the Contractor's Associations

Figure 7 reveals that majority (59%) of the construction companies are wholly indigenous construction companies. This shows that majority of the construction SMEs are indigenous construction companies which have been identified with peculiar health and safety problems.

Fig. 7: Proportion of Firms by Origin based on Public Procurement Act 2007 Classification

Figure 8 shows that majority of the construction SMEs (53%) operates nationally. This implies that the results obtained from the analysis of data collected from these construction SMEs can be used for generalisation.

Fig. 8: Proportion of Firms by Scope of Operation

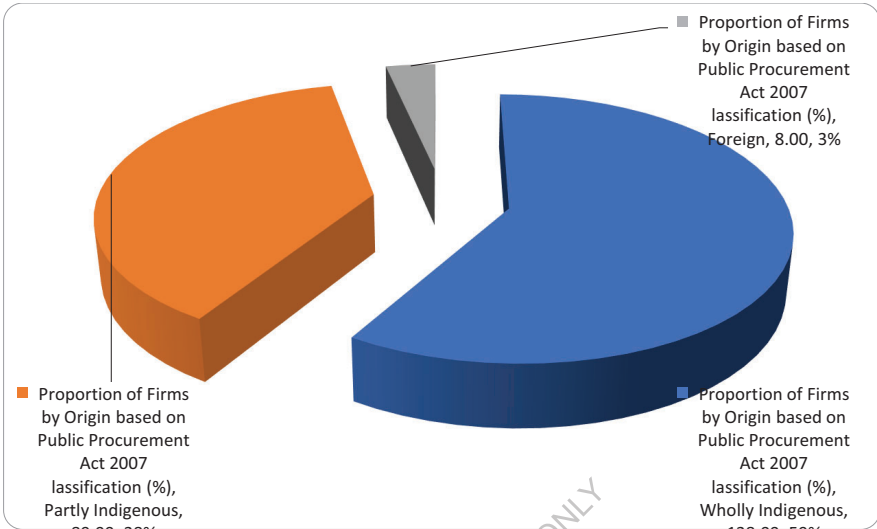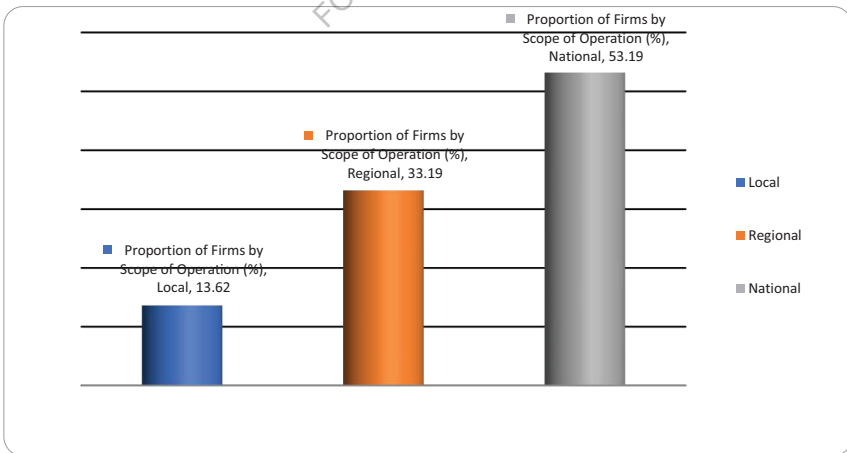## 4.2 Results and Discussion on H&S Management Practices/Regulations Adopted by Construction SMEs in Abuja, Nigeria

The results of the level of implementing the important H&S practices/regulations by construction SMEs are summarised in Tables 5 – 10.

Table 5: Level of Implementing Company's Commitment

S/NO	HEALTH AND SAFETY PRACTICES	MIS	ST. DEV	RANK
1	Provision of personal protective equipment	2.855	0.418	1st
2	Provision of first aid box	2.847	0.454	2nd
3	Provision of drinking water on site	2.843	0.438	3rd
4	Provision of adequate work space and neat environment	2.792	0.474	4th
5	Provision of cloak and toilet	2.723	0.526	5th
6	Provision of canteen service on site	2.643	0.591	6th
7	Existence of formal health and safety policy	2.540	0.751	7th
8	Keeping of safety record keeping and follow-ups	2.540	0.692	8th
9	Having a designated safety personnel	2.464	0.739	9th
10	Provision of procedures for reporting accidents	2.451	0.715	10th
11	Provision of procedures for investigating accidents and nearmisses	2.392	0.732	11th
12	Having fire protection programme	2.357	0.804	12th
13	Existence of minimization policy for cost of ill-health and injury	2.209	0.796	13th
14	Use of ISO 26000 to identify social responsibilities of employees	2.068	0.769	14th
15	Implementing employee drug testing	2.026	0.835	15th
16	Using outside health and safety consultants	1.723	0.764	16th

The results summarised in Table 5 revealed that the H&S practices implemented the most under "Company's Commitment" are "Provision of Personal Protective Equipment" (mean score = 2.855) and "Provision of First Aid Box" (MIS = 2.647). This is not surprising because these practices also ranked highest among the important H&S practices earlier identified. The least ranked H&S practices is "Using Outside H&S Consultants" (MIS = 1.723).

Table 6: Level of Implementing Workers' Consultation and Participation

S/NO	HEALTH AND SAFETY PRACTICES	MIS	ST. DEV	RANK
1	Rewarding workers who demonstrate exemplary safe behaviour on site	2.409	0.661	1st
2	Involving workers to participate in hazard identification on sites	2.387	0.732	2nd
3	Asking workers for their ideas on health and safety matters	2.323	0.725	3rd

4	Consulting trade union representatives on health and safety matters	1.996	0.858	4th

Table 6 revealed that the H&S practice implemented the most under "Workers' Consultation and Participation" is "Rewarding workers who demonstrate exemplary safe behaviour on site" (MIS = 2.409). This is also not surprising because this practice also ranked highest among the important H&S practices earlier identified. The least ranked H&S practices is "Consulting trade union representatives on health and safety matters" (MIS = 1.996).

Table 7: Level of Implementing H&S Communication

S/NO	HEALTH AND SAFETY PRACTICES	MEAN	ST. DEV	RANK
1	Using verbal communication with operatives during site tours.	2.736	0.552	1st
2	Discussing health and safety during site meetings	2.715	0.513	2nd
3	Using health and safety posters and other signs to give safety education	2.613	0.597	3rd
4	Communicating health and safety performance to employees	2.468	0.648	4th
5	Focusing your monthly safety meetings on employees' attitudinal change towards safety	2.383	0.651	5th
6	Communicating health and safety through company newsletter	2.319	0.775	6th
7	Communicating safety value to corporate stakeholders and use of two-way safety communication	2.213	0.759	7th
8	Networking with other companies/institutions	1.962	0.806	8th

Table 7 revealed that the H&S practice implemented the most under "H&S Communication" is "Using verbal communication with operatives during site tours" (MIS = 2.736). This was also expected this practice also ranked highest among the important H&S practices earlier identified. The least ranked H&S practices is "Networking with other companies/institutions" (MIS = 1.962).

Table 8: Level of Implementing H&S Planning

S/NO	HEALTH AND SAFETY PRACTICES	MIS	ST. DEV	RANK
1	Price health and safety in preliminaries	2.723	0.542	1st
2	Ensuring adequate welfare provisions on site	2.711	0.523	2nd
3	Documenting method statements	2.643	0.646	3rd
4	Providing insurance cover for sites and Employer-paid group insurance plan	2.643	0.619	4th
5	Identifying hazards on sites before work commences	2.528	0.667	5th
6	Providing emergency response plan	2.519	0.641	6th

7	Exercising disciplinary measures to correct wrong behaviours relating to health and safety	2.464	0.654	7th
8	Documenting risk assessments	2.380	0.725	8th
9	Carrying out safety pre-task planning	2.375	0.716	9th
10	Carrying out post-accident investigation	2.358	0.772	10th
11	Providing job hazard analysis	2.319	0.747	11th
12	Obtaining a labour certificate for every contract	2.102	0.787	12th

Table 8 revealed that the H&S practice implemented the most under "H&S Planning" is "Pricing health and safety in preliminaries" (MIS = 2.723). This was not expected because this practice did not rank highest among the important H&S practices earlier identified. The reason for this might be because the construction SMEs might engage in this practice in order to comply with the requirements in the conditions of contract. The least ranked H&S practices is "Obtaining a labour certificate for every contract" (MIS = 2.102).

Table 9: Level of Implementing H&S Education and Training

S/NO	HEALTH AND SAFETY PRACTICES	MIS	ST. DEV	RANK
1	Organizing orientation on safety for new workers	2.592	0.648	1st
2	Organizing site inductions for operatives	2.528	0.641	2nd
3	Organizing health and safety training and retraining for supervisors and/or senior management	2.502	0.674	3rd
4	Organizing health and safety training of operatives - first aid, manual lifting etc.	2.481	0,641	4th
5	Organizing toolbox talks	2.315	0.725	5th
6	Organizing alcohol- and substance-abuse programme	2.043	0.738	6th

Table 9 revealed that the H&S practice implemented the most under "H&S Education and Training" is "Organizing orientation on safety for new workers" (MIS = 2.592). This is not surprising because "Organizing orientation on safety for new workers" was among the most important H&S practices identified under "H&S Education and Training". The least ranked H&S practice here is "Organizing alcohol- and substance-abuse programme" (MIS = 2.043).

Table 10: Level of Compliance with Health and Safety Regulations

S/NO	H&S REGULATIONS	MIS	ST. DEV	RANK
1	H&S Provision in Condition of Contract	2.60	0.69	1st
2	H&S Provision in Workmen Compensation Act	2.49	0.68	2nd
3	H&S Provision in Factories Act 1990	2.43	0.73	3rd
4	H&S Provision in Labour, Safety & Welfare Bill 2012	2.37	0.71	4th
5	NESREA Act 2007	2.20	0.78	5th
6	H&S Provision in Public Health Act 1990	2.18	0.78	6th

The result of the MIS used for the ranking of the level of compliance with the H&S regulations by construction SMEs was presented in Table 10. It was revealed that the H&S regulation complied with the most is the Health, Safety and Welfare Provisions in Conditions of Contract with a mean score of 2.60. The health and safety regulation complied with the least is the Health, Safety and Welfare Provisions in Public Health Act 1990 with a MIS of 2.18. It can be deduced from the assessment of the level of compliance of the construction SMEs with each of the H&S regulations or Requirements that the construction SMEs attach the most significant importance to the Health, Safety and Welfare Provisions in Conditions of Contract than other H&S regulations or Requirements. This justifies the reason why most of the construction sites visited had first aid box even though not all had the complete items required in the first aid box (see Appendix D). This is, however, in line with the findings of Adeniran (2013) and Kalejaiye (2013) that despite the enactment of these H&S regulations in Nigeria cases of occupational accidents and illnesses are still highly recorded annually. In the same vein, Iden (2010), Okojie (2010) and Idoro (2011) also discovered that it is only the large construction companies that recognise H&S regulations while the smaller companies give H&S regulations little attention.

4.3 Results and Discussion on Relationship between Organisational Characteristics and H&S Management Practices of Construction SMEs in Abuja, Nigeria

This section concerns the inferential analysis of data carried out comprising of two methods of analysis. The first method was the use of factor analysis. This was employed to reduce the 46 important health and safety practices based on the five core practices group level. The second method was the use of hierarchical multiple regression analysis. This was employed to determine the relationship between organisational characteristics and health and safety practices of construction SMEs.

4.3.1 Results of factor analysis

The 46 important H&S practices of construction SMEs were subjected to Factor Analysis (FA) using IBM SPSS Version 20.0. Prior to the performance of FA, the suitability of the data for Factor Analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients of 0.5 and above. The Kaiser-Meyer-Okin (KMO) value was 0.942, exceeding the recommended value of 0.6

(Pallant, 2013) and Bartlett's Test of Sphericity (Pallant, 2013) with the value of 0.000 reached statistical significance of $p < 0.05$, supporting the factorability of the correlation matrix and hence suitability of the data for factor analysis. See Table 11 for the summary of the results of the KMO and Bartlett's Test 1.

Table 11: KMO and Bartlett's Test 1

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.942
Bartlett's Test of Sphericity	Approx. Chi-Square	9902.529
	Df	1035
	Sig.	.000

The FA revealed the presence of eight components with Eigenvalues exceeding 1 (1.141), explaining 24.581%, 11.366%, 9.724%, 8.546%, 7.536%, 5.232%, 3.296% and 2.481% of the variance respectively (see Table 12). An inspection of the screeplot revealed a clear break after the eighth component (see Figure 9). The eight-component solutions explained a total of 72.762% of the variance. Varimax Rotation with Kaiser Normalisation was performed to further confirm the adoption of the grouping of these eight-component solutions. The rotated solution in the Varimax Rotation revealed the presence of simple structure with the eight components showing a number of strong loadings indicating that the eight-component solutions are good for adoption (see Table 13).
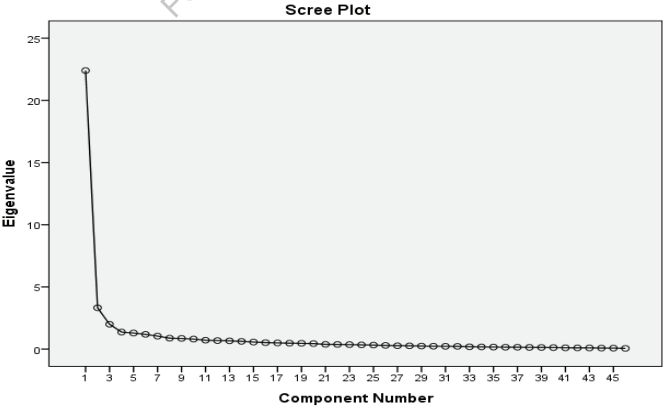

Fig. 9: Screeplot of Principal Component Analysis on Important H&S Practices

Table 12: Varimax Rotation for Factor Analysis 1

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	22.393	48.681	48.681	11.307	24.581	24.581
2	3.322	7.221	55.903	5.228	11.366	35.947
3	1.995	4.338	60.241	4.473	9.724	45.671
4	1.368	2.973	63.214	3.931	8.546	54.216
5	1.291	2.806	66.020	3.467	7.536	61.753
6	1.183	2.572	68.592	2.407	5.232	66.985
7	1.042	2.264	70.856	1.516	3.296	70.281
8	.877	1.906	72.762	1.141	2.481	72.762
9	.856	1.861	74.623			
10	.804	1.748	76.370			
11	.711	1.546	77.916			
12	.683	1.486	79.402			
13	.665	1.445	80.846			
14	.622	1.351	82.198			
15	.565	1.228	83.426			
16	.518	1.126	84.552			
17	.495	1.075	85.627			
18	.475	1.033	86.660			
19	.463	1.006	87.666			
20	.441	.959	88.625			
21	.380	.825	89.450			
22	.374	.813	90.263			
23	.359	.780	91.043			
24	.338	.734	91.777			
25	.323	.702	92.479			
26	.297	.645	93.125			
27	.269	.584	93.709			
28	.259	.562	94.270			
29	.246	.534	94.804			
30	.231	.502	95.306			
31	.221	.481	95.787			
32	.216	.471	96.257			
33	.186	.404	96.662			
34	.178	.386	97.048			
35	.163	.353	97.401			
36	.152	.330	97.731			
37	.147	.319	98.050			
38	.136	.296	98.346			
39	.132	.288	98.634			
40	.119	.259	98.893			
41	.103	.223	99.116			
42	.096	.209	99.325			
43	.095	.207	99.532			
44	.082	.179	99.710			
45	.076	.166	99.876			
46	.057	.124	100.000			

Total Variance Explained

Extraction Method: Principal Component Analysis.

Table 13: Pattern Matrix for Factor Analysis 1

Rotated Component Matrixª								
Safety Practices	**Component**							
	1	2	3	4	5	6	7	8
Formal H&S Policy	.582							
Designated safety personnel	.564							
Use outside H&S consultants			.773					
Canteen service on site		.626						
Provision of first aid box		.749						
Keeping H&S record and follow-ups	.554			.589				
Fire protection programme	.683							
Use of ISO 26000	.706							
Procedures for investigating accidents and nearmisses	.650							
Procedures for reporting accidents	.592							
Providing drinking water		.805						
Provision of cloak and toilet		.713						
Provision of PPE		.672						
Adequate work space and neat environment		.616						.565
Employee drug testing	.778							
Minimisation policy for cost of ill-health and injury	.760							
Using H&S posters and other signs to give safety education					.432			
Discussing H&S during site meetings					.387			
Verbal communication with operatives during site tours.					.562			
Communicating H&S value to corporate stakeholders & use of 2-way communication					.677			
Networking with other companies/institutions					.752			
Communicating H&S performance to employees					.511			
Communicating H&S through company newsletter					.646			
Focusing monthly safety meetings on employees' attitudinal change					.641			
Obtaining a labour certificate for every contract						.678		
Documenting risk assessments						.633		
Identifying hazards on sites before work commences						.407		
Insurance cover for sites							.610	
Post-accident investigation						.546		
Job hazard analysis						.563		
Documenting method statements							.603	
Price H&S in preliminaries							.766	
Exercising disciplinary measures to correct wrong behaviours relating to H&S						.602		

Table 13 Continued

Rotated Component Matrix^a

Safety Practices	Component							
	1	2	3	4	5	6	7	8
Ensuring adequate welfare provisions on site							.655	
Emergency response plan						.510		
Safety pre-task planning						.591		
Involving workers to participate in hazard identification on sites				.504				
Rewarding workers who demonstrate exemplary safe behaviour on site				.486				
Consulting trade union representatives on health and safety matters				.543		.551		
Asking workers for their ideas on health and safety matters				.671				
Site inductions for operatives								.724
H&S training &retraining for supervisor/senior mgt.								.675
New workers HS orientation								.702
Organising toolbox talks								.572
H&S training of operatives - first aid, manual lifting etc.								.588
Organising alcohol- and substance-abuse programme								.681

Based on the pattern matrix for Factor Analysis 1 (Table 13), the 46 H&S practices is reduced to eight major H&S practices classified as *Domestic Health and Safety Planning of Firms* (Component 1); *Practices Conforming to H&S Requirements in Conditions of Contract* (Component 2); *Using Outside Health and Safety Consultants* (Component 3); *Workers' Consultation and Participation* (Component 4); *Health and Safety Communication* (Component 5); *Pre-contract Health and Safety Planning* (Component 6); *Contract Health and Safety Planning* (Component 7); and *Education and Training* (Component 8).

Factor Analysis 2 also subjected the 6 H&S regulations guiding practices of construction SMEs identified from literature review to FA using IBM SPSS Version 20.0. Prior to the performance of FA, the suitability of the data for Factor Analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients of 0.5 and above. The KMO value was 0.825, exceeding the recommended value of 0.6 (Kaiser, 1970, 1974 cited in Pallant, 2013) and Bartlett's Test of Sphericity (Bartlett, 1954 cited in Pallant, 2013) with the value of 0.000

reached statistical significance of p < 0.05, supporting the factorability of the correlation matrix. FA revealed the presence of only one component with Eigenvalue exceeding 1, explaining 68.508% of the variance. An inspection of the screeplot revealed a clear break after the first component (see Figure 10). Based on this, H&S regulation guiding practices of construction SMEs with 6 H&S Regulations is reduced to one major H&S regulation guiding practices of construction SMEs with the title "H&S Regulations".
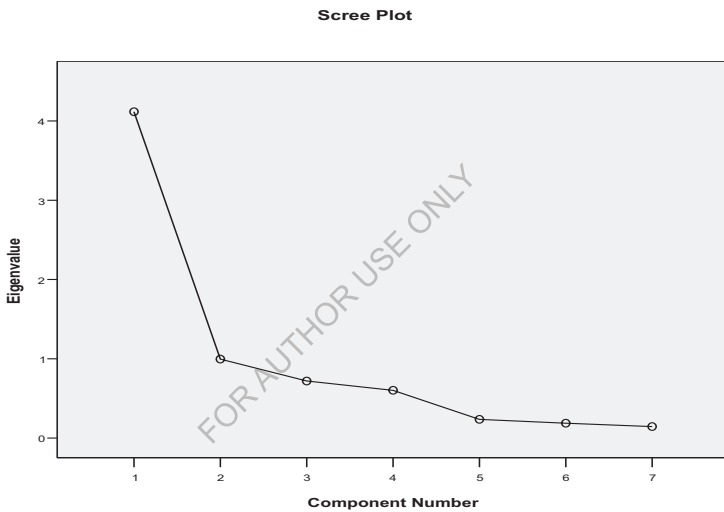

Fig. 10: Screeplot of Principal Component Analysis on H&S Regulations

In summary, the results of the FA undertaken reduced the 46 important H&S practices and 6 H&S regulations identified into nine (9) groups. These are: Domestic H&S Planning of Firms; Practices Conforming to H&S Requirements in Conditions of Contract; Using Outside H&S Consultants; Workers' Consultation and Participation; H&S Communication; Pre-contract H&S Planning; Contract H&S Planning; H&S Education and Training; and Main H&S Regulations. These H&S practices were used for further analyses to explore the relationship between organisational characteristics and health and safety practices of construction SMEs. The next section gives a detailed discussion of these analyses.

4.3.2 Results of hierarchical multiple regression analysis

The use of hierarchical multiple regression (HMR) analysis was employed to explore the relationship between the seven organisational characteristics identified from the study which are years of experience of safety supervisor; age of firm; number of employees in the firm; annual turnover of firm; firms' growth rate based on number of employees (Growth Rate by Size); firms' growth rate based on annual turnover (Growth Rate by Turnover); and construction type and the nine main H&S practices/procedures of firms identified from the FA carried out. Nine major analyses were carried out using the multiple hierarchical regression analysis as discussed in detail below. Prior to the use of HMR analysis, a preliminary analysis was carried out to confirm the suitability of the data for HMR analysis. For all the data used, the suitability test revealed that all the data were suitable for HMR analysis. This because the preliminary test revealed that there was no violation of the assumptions of normality, linearity, multicollinearity and homoscedasticity; the tolerance value was greater than 0.10, variance inflation factor (VIF) value less than 10, Normal P-P Plot points lie in a reasonably straight diagonal line from bottom left to top right and the Scatterplot standardised residuals roughly rectangularly distributed for all the data set (see Figures 11 – 28). The presences of outliers were also checked and it was observed that the maximum Mahalanobis Distance value observed is greater than the critical value (24.32) indicating absence of outliers in all cases. The maximum Cook's Distance in the analysis is 0.358 which is less than 1 indicating the absence of any undue influence on the results of in all cases.
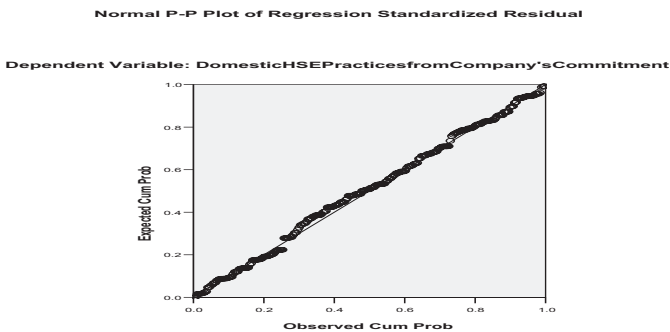

Fig. 11: Normal P-P Plot of Observed & Expected Cumulative Probability of Domestic H&S Practices from Company's Commitment
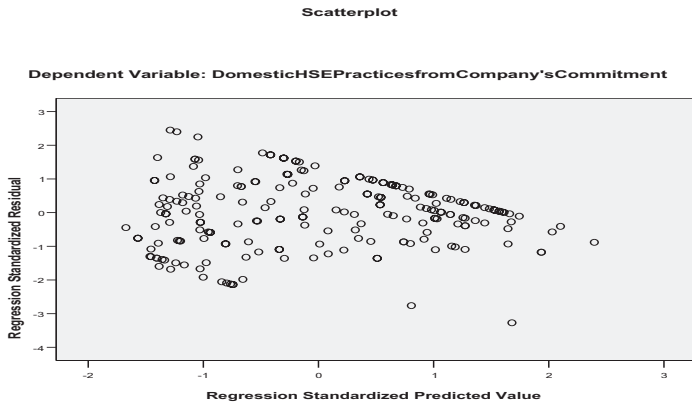
42

Scatterplot

Dependent Variable: DomesticHSEPracticesfromCompany'sCommitment

Fig. 12: Scatter Plot of Regressed Standardised Predicted & Residual Values of Domestic H&S Practices from Company's Commitment
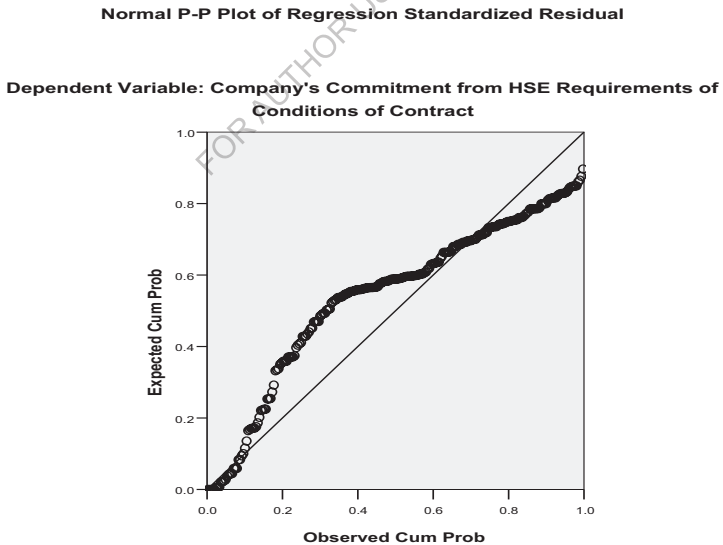
Normal P-P Plot of Regression Standardized Residual

Dependent Variable: Company's Commitment from HSE Requirements of Conditions of Contract

Fig. 13: Normal P-P Plot of Observed & Expected Cumulative Probability of Company's Commitment from H&S Requirements in Conditions of Contract

Scatterplot

Dependent Variable: Company's Commitment from HSE Requirements of Conditions of Contract

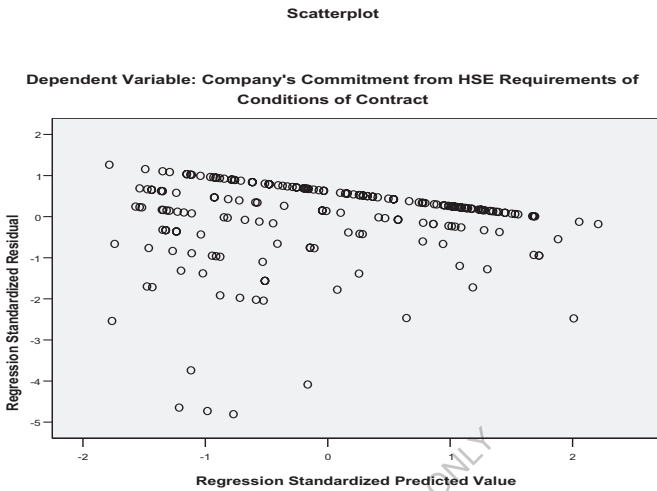

Fig. 14: Scatter Plot of Regressed Standardised Predicted & Residual Values of Company's Commitment from H&S Requirements in Conditions of Contract

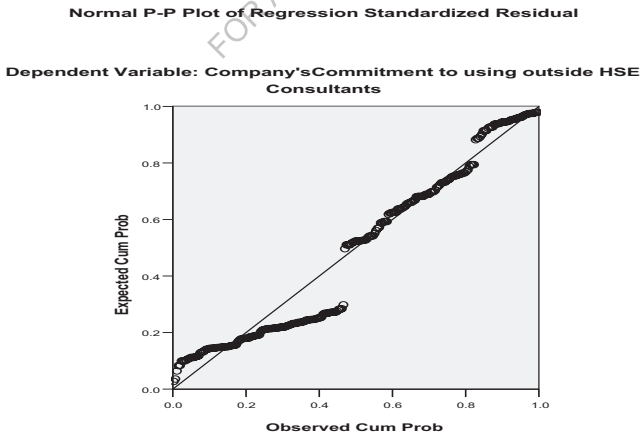**Normal P-P Plot of Regression Standardized Residual**

Dependent Variable: Company'sCommitment to using outside HSE Consultants

Fig. 15: Normal P-P Plot of Observed & Expected Cumulative Probability of Company's Commitment to Using Outside H&S Consultants

Dependent Variable: Company'sCommitment to using outside HSE Consultants

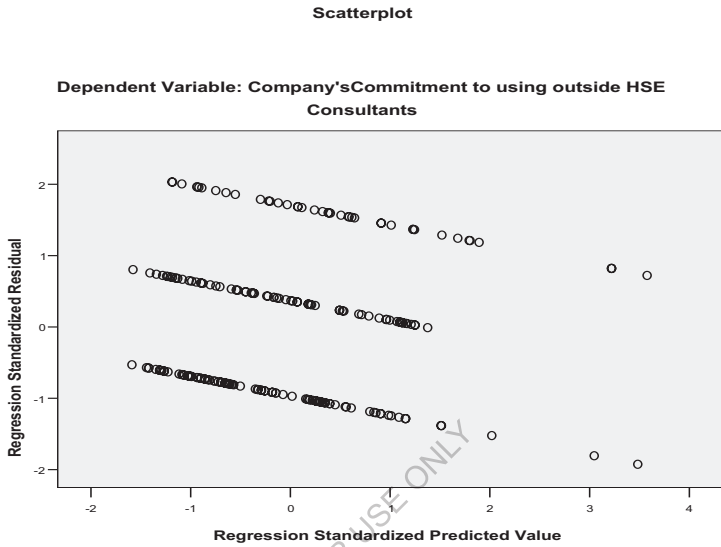Fig. 16: Scatter Plot of Regressed Standardised Predicted & Residual Values of Company's Commitment to Using outside H&S Consultants

Normal P-P Plot of Regression Standardized Residual

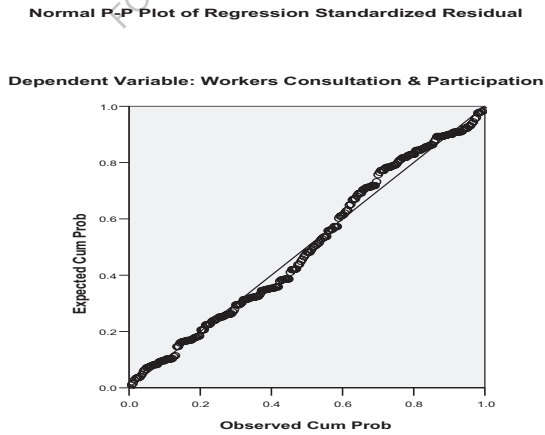**Dependent Variable: Workers Consultation & Participation**

Fig. 17: Normal P-P Plot of Regression Standardised Residual of Workers Consultation & Participation

Fig. 18: Scatter Plot of Regressed Standardised Predicted & Residual Values of
Workers Consultation & Participation

Fig. 19: Normal P-P Plot of Observed & Expected Cumulative Probability of
Health & Safety Communication

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Scatterplot

Dependent Variable: Health & Safety Communication
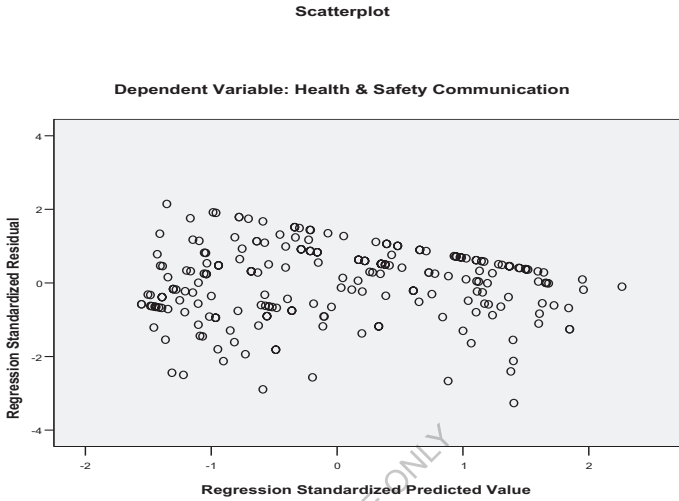
Fig. 20: Scatter Plot of Regressed Standardised Predicted & Residual Values of Health & Safety Communication

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: Pre-contract Health & Safety Planning

Fig. 21: Normal P-P Plot of Observed & Expected Cumulative Probability of Pre-contract Health & Safety Planning

Scatterplot

Dependent Variable: Pre-contract Health & Safety Planning

Fig. 22: Scatter Plot of Regressed Standardised Predicted & Residual Values of
Pre-contract Health & Safety Planning

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: Contract Health & Safety Planning
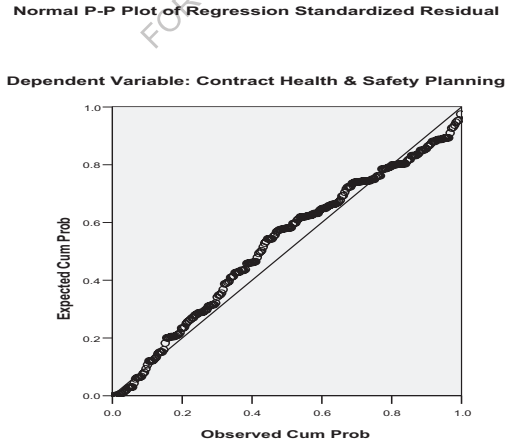
Fig. 23: Normal P-P Plot of Observed & Expected Cumulative Probability of
Contract Health & Safety Planning

Scatterplot

Dependent Variable: Contract Health & Safety Planning
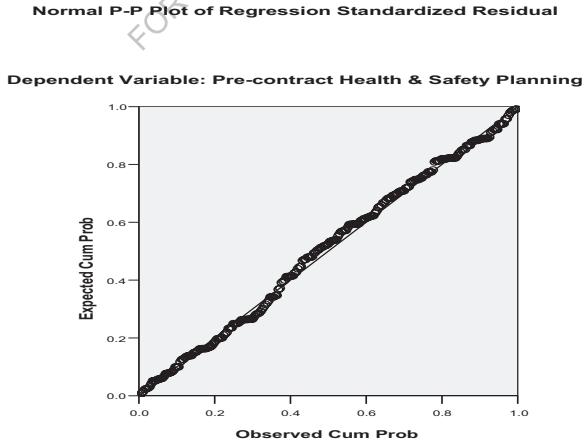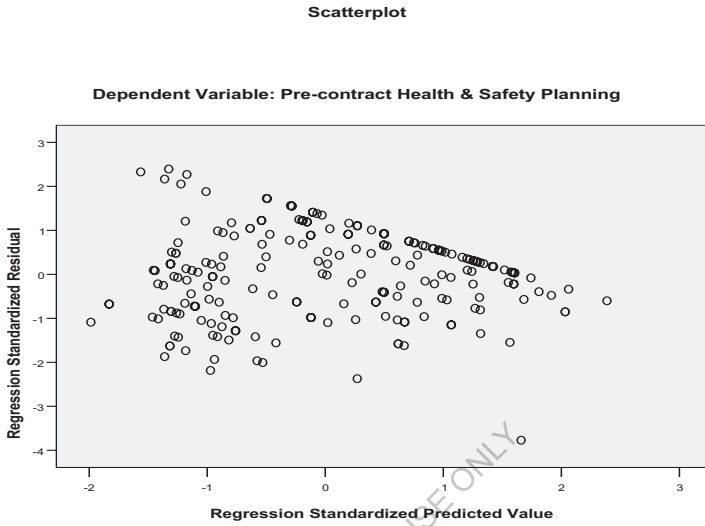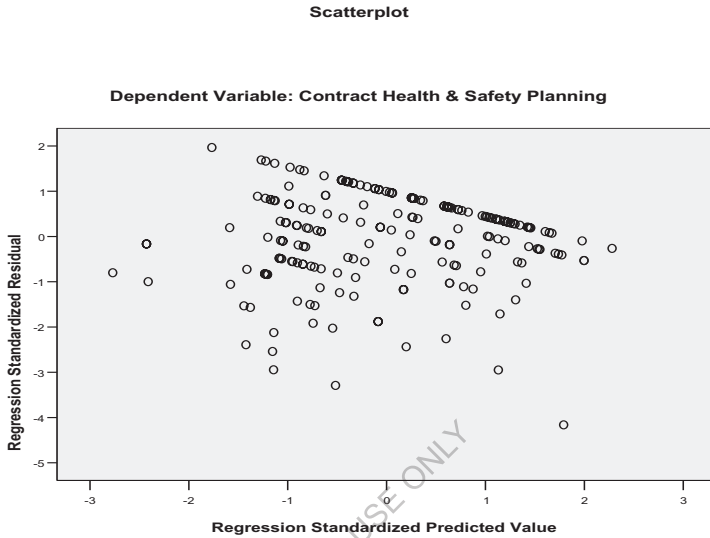

Fig. 24: Scatter Plot of Regressed Standardised Predicted & Residual Values of Contract Health & Safety Planning

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: HSE Education & Training
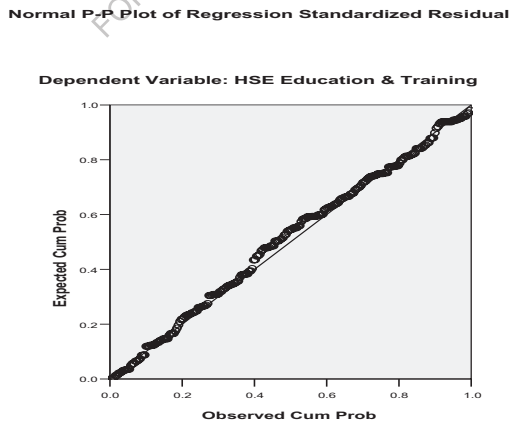
Fig. 25: Normal P-P Plot of Observed & Expected Cumulative Probability of H&S Education & Training

Scatterplot

Dependent Variable: HSE Education & Training

Fig. 26: Scatter Plot of Regressed Standardised Predicted & Residual Values of H&S Education & Training

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: Main HSE Regulations
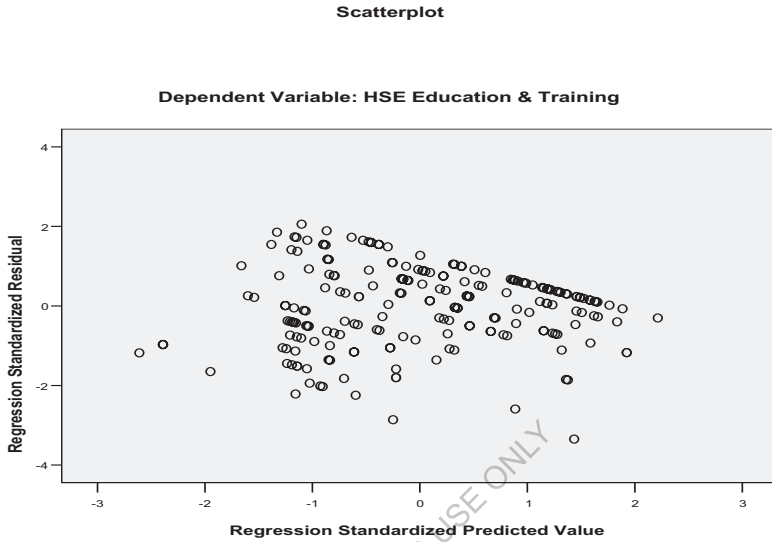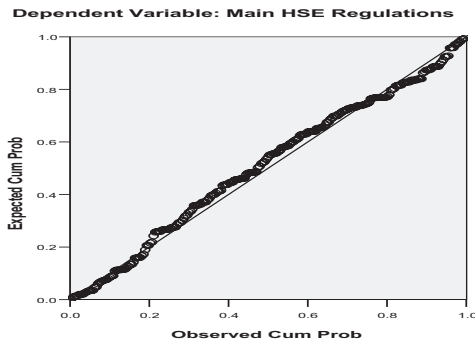

Fig. 27: Normal P-P Plot of Observed & Expected Cumulative Probability of Main H&S Regulations

Scatterplot

Dependent Variable: Main HSE Regulations
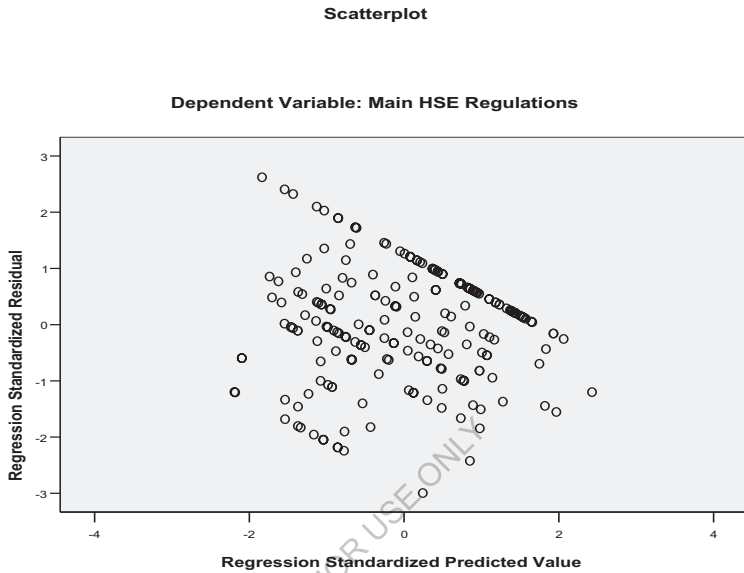
Fig. 28: Scatter Plot of Regressed Standardised Predicted & Residual Values of Main H&S Regulations

It was observed from the first HMR analysis that there exists a strong and significant relationship between Domestic H&S Commitment and six (6) organisational characteristics (Years of Experience; Age of Firms; Number of Employees; Growth Rate by Size of Firm; Construction Type; and Annual Turnover). The coefficient of correlation (r) observed ranged between 14.50 – 62.00% (0.145 -0.620), while the Pvalue (sig) observed ranged from 0.000 – 0.024. The second HMR analysis revealed a slightly weak and significant relationship between H&S Practice in Conditions of Contract and four (4) organisational characteristics (Years of Experience; Age of Firms; Number of Employees; and Annual Turnover). The r value observed ranged between 14.50 – 30.50% (0.135 -0.305), while the Pvalue (sig) observed ranged from 0.000 – 0.035. In the third HMR analysis, it was shown that there exists a weak and significant relationship between Company's Commitment of Using Outside H&S Consultants and two (2) organisational characteristics (Growth Rate by Turnover of Firms; and Construction Type). The r

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value observed ranged between 14.90 – 24.50% (0.149 -0.245), while the Pvalue (sig) observed ranged from 0.001 – 0.011. It was revealed from the fourth HMR analysis that there exists a slightly weak and significant relationship between H&S Worker's Consultation & Participation and five (5) organisational characteristics (Years of Experience; Age of Firms; Number of Employees; Construction Type; and Annual Turnover). The r value observed ranged between 14.70 – 45.00% (0.147 - 0.450), while the Pvalue (sig) observed ranged from 0.000 – 0.021. In the fifth HMR analysis, a strong and significant relationship between H&S Communication & Participation and four (4) organisational characteristics (Age of Firms; Number of Employees; Construction Type; and Annual Turnover). The r value observed ranged between 14.30 – 51.00% (0.143 -0.510), while the Pvalue (sig) observed ranged from 0.000 – 0.031. The sixth HMR analysis revealed a strong and significant relationship between Pre-contract H&S Planning and five (5) organisational characteristics (Years of Experience; Age of Firms; Number of Employees; Construction Type; and Annual Turnover). The r value observed ranged between 15.40 – 59.60% (0.154 -0.596), while the Pvalue (sig) observed ranged from 0.000 – 0.017. A slightly strong and significant relationship between Contract H&S Planning and five (5) organisational characteristics (Years of Experience; Age of Firms; Number of Employees; Growth Rate by Size of Firms; and Annual Turnover) in the sixth HMR analysis. The r value observed ranged between 14.70 – 44.50% (0.147 -0.445), while the Pvalue (sig) observed ranged from 0.000 – 0.017. The eighth HMR analysis showed that there exists a strong and significant relationship between H&S Education & Training and five (5) organisational characteristics (Age of Firms; Number of Employees; Growth Rate by Size of Firms; Construction Type; and Annual Turnover). The r value observed ranged between 19.00 – 55.00% (0.190 -0.550), while the Pvalue (sig) observed ranged from 0.000 – 0.017. Finally, it was shown that there exists a strong and significant relationship between H&S Regulations and five (5) organisational characteristics (Years of Experience; Age of Firms; Number of Employees; Construction Type; and Annual Turnover) in the ninth HMR analysis. The r value observed ranged between 15.00 – 55.00% (0.150 -0.550), while the Pvalue (sig) observed ranged from 0.000 – 0.049. The results of the HMR analysis are summarised in Table 14.

Table 14: Summary of Results of HMR Analysis

Analysis	Variables		Observations		Inferences		
	X	Y	r (%)	LOS	P_value	Strength	Remark
Organisational Characteristics (X) Vs Domestic H&S Commitment (Y)							
1a	Yrs of Experience	DHSECompanyCttmt	14.50	0.05	0.024	Weak	SS
1b	Age of Firm	DHSECompanyCttmt	42.00	0.05	0.000	Slightly Strong	SS
1c	Nr of Employees	DHSECompanyCttmt	62.00	0.05	0.000	Strong	SS
1d	Growth Rate by Size	DHSECompanyCttmt	7.40	0.05	0.009	Weak	SS
1e	Const Type	DHSECompanyCttmt	36.30	0.05	0.001	Slightly Weak	SS
1f	Annual Turnover	DHSECompanyCttmt	49.00	0.05	0.000	Strong	SS
Organisational Characteristics (X) Vs H&S Practice in Conditions of Contract (Y)							
2a	Yrs of Experience	Prac Conform to C of C	13.50	0.05	0.035	Weak	SS
2b	Age of Firm	Prac Conform to C of C	24.90	0.05	0.001	Weak	SS
2c	Nr of Employees	Prac Conform to C of C	30.50	0.05	0.004	Weak	SS
2d	Annual Turnover	Prac Conform to C of C	30.00	0.05	0.000	Slightly Weak	SS
Organisational Characteristics (X) Vs Company's Commitment of Using Outside H&S Consultants (Y)							
3a	Growth Rate by Turnover	Comp Cmmt to Outside H&E Consultant	24.50	0.05	0.001	Weak	SS
3b	Const Type	Comp Cmmt to Outside H&S Consultant	14.90	0.05	0.011	Weak	SS
Organisational Characteristics (X) Vs Worker's Consultation & Participation (Y)							
4a	Yrs of Experience	Workers Consult & Part	14.70	0.05	0.021	Weak	SS
4b	Age of Firm	Workers Consult & Part	29.50	0.05	0.000	Weak	SS
4c	Nr of Employees	Workers Consult & Part	45.00	0.05	0.000	Slightly Strong	SS
4d	Const Type	Workers Consult & Part	34.00	0.05	0.000	Slightly Weak	SS
4e	Annual Turnover	Workers Consult & Part	36.00	0.05	0.000	Slightly Weak	SS
Organisational Characteristics (X) Vs H&S Communication (Y)							
5a	Age of Firm	HSE Communication	36.00	0.05	0.000	Slightly Weak	SS
5b	Nr of Employees	HSE Communication	51.00	0.05	0.000	Strong	SS
5c	Const Type	HSE Communication	14.30	0.05	0.031	Weak	SS
5d	Annual Turnover	HSE Communication	43.00	0.05	0.000	Slightly Strong	SS
Organisational Characteristics (X) Vs Pre-contract H&S Planning (Y)							
6a	Yrs of Experience	Pre-contract HSE Planning	15.40	0.05	0.017	Weak	SS
6b	Age of Firm	Pre-contract HSE Planning	42.30	0.05	0.000	Slightly Strong	SS
6c	Nr of Employees	Pre-contract HSE Planning	59.60	0.05	0.000	Strong	SS

6d	Const Type	Pre-contract HSE Planning	35.50	0.05	0.001	Slightly Weak	SS
6e	Annual Turnover	Pre-contract HSE Planning	44.00	0.05	0.000	Slightly Strong	SS
Organisational Characteristics (X) Vs Contract H&S Planning (Y)							
7a	Yrs of Experience	Contract HSE Planning	14.70	0.05	0.023	Weak	SS
7b	Age of Firm	Contract HSE Planning	33.60	0.05	0.000	Slightly Weak	SS
7c	Nr of Employees	Contract HSE Planning	44.50	0.05	0.000	Slightly Strong	SS
7d	Growth Rate by Size	Contract HSE Planning	-19.00	0.05	0.029	Weak	SS
7e	Annual Turnover	Contract HSE Planning	33.00	0.05	0.000	Slightly Weak	SS
Organisational Characteristics (X) Vs H&S Education & Training (Y)							
8a	Age of Firm	Education & Training	38.00	0.05	0.000	Slightly Weak	SS
8b	Nr of Employees	Education & Training	55.00	0.05	0.000	Strong	SS
8c	Growth Rate by Size	Education & Training	19.00	0.05	0.012	Weak	SS
8d	Const Type	Education & Training	30.00	0.05	0.028	Slightly Weak	SS
8e	Annual Turnover	Education & Training	42.00	0.05	0.000	Slightly Strong	SS
Organisational Characteristics (X) Vs H&S Regulation (Y)							
9a	Yrs of Experience	H&S Regulations	15.00	0.05	0.049	Weak	SS
9b	Age of Firm	H&S Regulations	31.00	0.05	0.000	Slightly Weak	SS
9c	Nr of Employees	H&S Regulations	55.00	0.05	0.000	Strong	SS
9d	Const Type	H&S Regulations	35.00	0.05	0.001	Slightly Weak	SS
9e	Annual Turnover	H&S Regulations	35.00	0.05	0.000	Slightly Weak	SS

In summary, the results of the HMR analysis summarised in Table 14 showed that there exist a positive and significant relationship between organisational characteristics and H&S management practices of construction SMEs in Abuja, Nigeria. Therefore, the null hypotheses are rejected. However, the results of the study are in line with the findings of previous studies. For instance, the result of the study carried out by Idoro (2011) is evident to the findings of this study because it revealed that the protection provided to workers engaged by multi-national and national contractors is higher than the protection provided to workers engaged by regional and local contractors in order to protect workers from sustaining injuries in the event of accident. The findings of Adeogun and Okafor (2013) also corroborates with the findings of this study because it revealed that most of the indigenous establishments see H&S myopically such as cleanliness of the environment alone while the few companies that recognise occupational H&S are the large companies or big multinationals who are running the policies as constituted in their parent

countries of origin. Majority of the construction SMEs undertaking mainly civil engineering construction works are the medium-sized firms among which have a tendency of becoming large or multinational firms. The finding of Agumba and Haupt (2014), on the other hand, disagrees with the findings of this study because it reported that the number of years spent in the construction industry does not change the perception of the owner/manager in relation to the H&S practices that depict organisational H&S culture.

4.4 Results and Discussion on Favourable Conditions for Effective Safety Performance of Construction SMEs in Abuja, Nigeria

The results of the study have already established that organisational characteristics are good and significant predictors of the H&S practices of construction SMEs. This therefore implies that there is a greater room for improvement in the H&S performance of the Nigerian construction SMEs by a change in attitude. This will assist to address the challenges faced by construction SMEs. The need for an enabling environment for improving H&S management within the Nigerian construction SMEs was also obvious from the findings of this study. On this basis, the study went further to determine favourable conditions for effective safety performance of the construction SMEs. In order to achieve this, the use of mean ranking of the level of implementing H&S practices by the construction SMEs was employed. Table 15 shows the band/categories of the respective organisational characteristics with their level of implementation of the H&S practices ranked on a scale of 1-3. The mix of organisational characteristics which gives the favourable conditions for effective safety performance of construction SMEs are extracted from Table 15 and summarised in Table 16. Table 16 also gives the average level of implementation of H&S practices given by the favourable conditions for effective safety performance of construction SMEs.

Table 15: Level of Implementation of H&S Practices by Firms with Different Organisational Characteristics

Organisational Characteristics			MIS	Rank	Favourable Conditions
Experience	A1	1 - 5 Yrs	2.33	4th	16 - 20 years' experience
	A2	6 - 10 Yrs	2.32	5th	
	A3	11 - 15 Yrs	2.38	3rd	
	A4	16 - 20 Yrs	**2.63**	**1st**	
	A5	> 20 Yrs	2.49	2nd	
Age of Firm	B1	1 - 5 Yrs	1.98	5th	> 20 Years
	B2	6 - 10 Yrs	2.28	4th	

	B3	11 - 15 Yrs	2.30	3rd	
	B4	16 - 20 Yrs	2.51	2nd	
	B5	> 20 Yrs	**2.58**	**1st**	
Size of Firm	C1	≤ 30 employees	2.07	3rd	71 - 200 employees
	C2	31 - 70 employees	2.47	2nd	
	C3	71 - 200 employees	**2.64**	**1st**	
Annual Turnover	D1	< N2 million	1.98	5th	N10 - 15 million
	D2	N2 - 5 million	2.33	4th	
	D3	N5 - 10 million	2.36	3rd	
	D4	N10 - 15 million	**2.64**	**1st**	
	D5	N15 - 20 million	2.53	2nd	
Growth Rate by Size	E1	0 - 10%	2.38	3rd	31 - 40%
	E2	11 - 2 0%	2.28	4th	
	E3	21 - 30%	2.47	2nd	
	E4	31 - 4 0 %	**2.80**	**1st**	
	E5	4 1 - 5 0 %	2.28	4th	
Growth Rate by Turnover (GR2)	F1	0 - 5%	2.31	3rd	11 - 15%
	F2	6 - 10%	2.45	2nd	
	F3	11 - 15%	**2.69**	**1st**	
	F4	16 - 20%	2.08	5th	
	F5	20 - 25%	2.30	4th	

Table 16: Favourable Conditions for Effective Safety Performance

Organisational Characteristics	Size Band	MIS
Experience	16 - 20 Years	2.63
Age of Firm	20 Years and above	2.58
Size of Firm	71 - 200 Employees	2.64
Annual Turnover	=N= 10 - 15 million	2.64
Growth Rate by Size	31 - 40%	2.80
Growth Rate by Turnover	11 - 15%	2.69
Average Level of Implementation of	**H&S Practices**	**2.663**

It was revealed from Table 16 that the favourable conditions for effective safety performance of construction SMEs are:

i. Years of Experience of safety supervisor of 16 years and above with the highest MIS (2.63) among the years of experience categories. This agrees with the finding of regression results that construction SMEs with higher experience are more likely to be more safety conscious than those with lesser experience.

ii. Age of Firm of 20 years and above with the highest MIS (2.58) among the Age of Firms categories. This supports the finding of regression results that older construction SMEs are more likely to be more safety conscious than newer ones.

iii. Size of Firm (Number of Employees) of 71 - 200 employees with the highest MIS (2.64) among the Size of Firms categories. This agrees with the finding of regression results that construction SMEs with greater number of full-time employees are more likely to be more safety conscious than those with fewer numbers of full-time employees.

iv. Annual Turnover of =N=10 million and above with the highest MIS (2.64) among the Annual Turnover categories. This is in agreement with the finding of regression results that construction SMEs with higher annual turnover are more likely to be more safety conscious than those with lesser annual turnover.

v. Growth Rate by Size of 31% and above with the highest MIS (2.80) among the Growth Rate1 categories. This support the research findings that construction SMEs with higher growth rate are more likely to be safety conscious than their counterpart with lesser growth rate.

vi. Growth Rate by Turnover of 11% and above with the highest MIS (2.69) among the Growth Rate2 categories. This is also in agreement with the research findings that construction SMEs with higher growth rate are more likely to be safety conscious than their counterpart with lesser growth rate.

The mix of organisational characteristics in Table 12 (favourable conditions) gives an average level of implementation of H&S practices of 2.663. This indicates that this mix of organisational characteristics is capable of bringing about 89% improvements in the safety performance of the construction SMEs.

5.0 CONCLUSION AND RECOMMENDATIONS

In view of the findings of this study, it was concluded that organisational characteristics have significant influence on the H&S management practices of construction SMEs in Abuja, Nigeria. The level of implementation of H&S practices therefore increases with the increase in the value of organisational characteristics and leads to effective safety performance at specific favourable conditions. Therefore, for the safety performance of a small and medium-sized construction company to be effective, the following conditions should be met: Having being in existence for about 20 years and above; Employing a safety officer/supervisor/site manager with an experience of 20 years and above; Having a site workforce of 71 employees and above; Having an annual turnover of =N=10 Million and above;

Having a growth rate by size of workforce of 21% and above; and Having a growth rate by annual turnover of 11% and above.

In view of the findings and conclusion of this study, it was recommended that owner/managers of construction SMEs should create adequate awareness, through safety meetings/inductions, to educate workers on the implementation of the important H&S practices/procedures for improved health and safety performance. This is because *H&S Education and Training* ranked highest among the five-core H&S practices of construction SMEs. In addition, owner/managers of construction SMEs should focus more commitment on good H&S practices on site and also get workers involved in H&S planning activities carried out by the firm in order to create a sense of belonging to the workers and an enabling environment for improved safety performance. This is because it was discovered that organisational characteristics have significant influence on the H&S practices of construction SMEs. Finally, H&S regulations should be prioritised and categorised based on firm's size and project complexity in order to enable the requirements for smaller projects to be distinguished from that of larger projects and more important/urgent issues can be separated from the less important/urgent ones. This will ease cost of compliance for construction SMEs because construction SMEs who are yet to attain the favourable conditions for effective safety performance might lack the capability to really put up a standard H&S procedure. This recommendation also emanated from the suggestions made by the respondents and also reported in the study's findings.

In the light of the limitations of this study, some vital areas are recommended for further research. Data on occupational illnesses relating to construction SMEs did not form part of this study. Occupational health experts approached also spoke more about safety than health, thereby focusing more on occupational accidents than occupational illnesses. A study of the frequency and severity of the occurrence of occupational illnesses is, however, important in the attempt of finding solutions to workplace accidents and ill health. Carrying out a study in this context could form a good basis for developing specific workplace H&S framework targeted at minimising the risks of specific health hazards in the SME sector. The incidence of ill health within construction SMEs in Nigeria is therefore suggested to be carried out in future researches. This study focused more on the internal environment of construction SMEs. Further researches should be carried out to explore the effect of relationship between the internal and external environment on H&S management

practices of construction SMEs with a view to developing a framework for improving safety performance of construction SMEs.

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APPENDICES

QUESTIONNAIRES FOR PILOT SURVEY

Questionnaire for Pilot Study (Stage I)

Department of Quantity Surveying
Ahmadu Bello University
Zaria – Nigeria

QUESTIONNAIRE SURVEY

EVALUATION OF HEALTH AND SAFETY MANAGEMENT PRACTICES OF NIGERIAN CONSTRUCTION CONTRACTORS

SECTION A – Particulars and General Information

Please enter your name, position and the details of your organisation.
All responses will be confidential and will not be connected in any way to yourself or your organisation.

Name: _____

Position/Profession: _____

Organization: _____

Years of Experience: _____

Telephone: _____

Postal Address: _____

Email: _____

SECTION B: Contextual Factors Influencing Health and Safety Management of SMEs

The table below gives a list of the identified contextual factors influencing health

and safety management practices of Nigerian construction SMEs. Please kindly rank

these factors in order of importance by ticking the appropriate option from the

options ranked 1 – 5.

S/NO	CONTEXTUAL FACTORS INFLUENCING HEALTH AND SAFETY MANAGEMENT PRACTICES OF CONSTRUCTION SMEs	5 Most Important	4 Important	3 Undecided	2 Less Important	1 Least Important
1	Low literacy level					
2	Low socio-economic status					
3	Owner managers' ignorance of Occupational Health & Safety (OHS) responsibilities					
4	Culture with respect to extended family obligations					
5	Ineffective OHS administration					
6	Poor infrastructure					
7	Human relations/Communication problem					
8	Unregulated practices					
9	Adherence to traditional methods of working					
10	Non availability of construction equipment					
11	Extreme weather conditions					
12	Corruption and bribery					
13	Societal cultural biases					
14	Societal orientations to power relationships					
15	Materialism					
16	Risk taking					
17	Availability of cheap labour					
18	Low wages					
19	Lack of Organizational OHS policies					
20	Age					
21	Experience					
22	Marital status					
23	Dependent					
24	Employment Status/Unemployment					
25	Habit					
26	Government policies					
27	Competition from other contractors					

28	Team work/collectivism					
29	Access to finance/funding challenges					
30	Interest rate					
31	Interim payment					
32	Weak legal structure and National OHS standards					
33	Licensing and certification of plant operators					
34	Clients' reaction to safety procedure					
35	Insurance policies					
36	Legal sanctions					
37	Lack of understanding of Moral and legal responsibility of employers					
38	OHS violation					
39	Lack of strict judicial reference to OHS legislation in Nigeria					
40	Lack of corporate responsibility and accountability					
45	Repressive & undemocratic Human Right records					
46	Lack of political will (Nigerian factor)/Trade Union involvement					
47	Lack of adequate information and statistics					
48	Inadequate staff training					
49	Shortage of professional labour					
50	Cultural dimension in respect to religious and traditional beliefs					
51	Payment system/Reward methods					
52	Changes in technological advancement					
53	Industry norm/Organizational safety culture					
54	Ineffective Supervision and equipment management					
55	Individualism					
56	Uncertainty avoidance					
57	Long term orientation					
58	Short term orientation					

S/No		5 Most Important	4 Important	3 Undecided	2 Less Important	1 Least Important
59	Masculinity					
60	Femininity					

SECTION C: Practices/Procedures for Managing Health and Safety

The table below gives a list of the identified health and safety practices from the literature review of this study. Please kindly rank these practices in order of importance by ticking the appropriate option from the options ranked 1 – 5.

S/No	SAFETY PRACTICES FOR HEALTH AND SAFETY MANAGEMENT OF CONSTRUCTION SMEs	5 Most Important	4 Important	3 Undecided	2 Less Important	1 Least Important
1	Accident and nearmiss investigation					
2	Jobsite inspection					
3	Job hazard analysis					
4	Safety inductions					
5	Safety record keeping and follow-ups					
6	Effective safety committee					
7	Safety incentives					
8	Control of subcontractors					
9	Top management involvement					
10	Higher average wage of workers					
11	Longer average length of employment					
12	Adequate work space and neat environment					
13	Higher percentage of married workers					
14	Safety training and orientations					
15	Safety pre-task planning					
16	Safety person or personnel					
17	Safety policies and procedures					
18	Fire protection programme					
19	Accountability/responsibility and safety budget					

No.	Item					
20	Alcohol- and substance-abuse programme					
21	Formal safety inspection per month					
22	Safety meetings					
23	Detailed safety programmes					
24	Expended large percentage of revenue on safety performance					
25	Health and safety responsibility known					
26	Encouragement of supervisor involvement					
27	Safety reward					
28	Effective identification and hazard elimination/control					
29	Use of more directly employed labour					
30	Post-accident investigation					
31	Compliance with customer or regular certification schemes					
32	Minimization of cost of ill-health and injury					
33	Desire to improve staff morale and productivity					
34	Minimization of workers' turnover					
35	Implementing employee drug testing					
36	Use of external assistance with respect to health and safety issues					
37	Regulatory enforcement activity					
38	Hazard management plan in use of plant and equipment					
39	Use of ISO 26000					
40	Holding management accountable for health and safety					
41	Communicating safety value to corporate stakeholders and Two-way safety communication					
42	Training and retraining of employees on safe work procedure					
43	Increase in safety auditing					
44	Focusing of monthly safety meetings on employees' attitudinal change towards safety					
45	Emergency response plan					

46	Recognizing unique needs of members of the organization					
47	Provision of Personal Protective Equipment (PPE)					
48	Provision of first aid facilities on site					
49	Mobile clinic					
50	Use of posters and other signs to give safety education					
51	Fencing of sites					
52	Provision of transport for workers					
53	Provision of drinking water					
54	Provision of toilet					
55	Provision of cafeteria					
56	Provision of changing/rest room					
57	Employer-paid group insurance plan					
58	Workers' involvement					

SECTION C

What are your suggestions for helping contractors to manage construction site health and safety more effectively to minimize the incidence of ill health and accidents on construction sites? *(Please use a separate sheet if necessary)*

Please feel free to give a general comment on the questionnaire or any part of the factors if you have. It will be gratefully appreciated. *(Please use a separate sheet if necessary)*

Thank you very much for your co-operation.

For further enquiries please contact:
SHITTU, Abdullateef Adewale
Department of Quantity Surveying
Ahmadu Bello University,
Zaria – Nigeria.
Tel (+234) 8034767554, 8054871781
Email: funsho@futminna.edu.ng or aishatabdulahi2007@yahoo.com

Questionnaire for Pilot Study (Stage II)

Department of Quantity Surveying
Ahmadu Bello University
Zaria – Nigeria

QUESTIONNAIRE SURVEY

INFLUENCE OF CONTEXTUAL ENVIRONMENT ON HEALTH AND
SAFETY PERFORMANCE OF SMALL AND MEDIUM-SIZED
CONSTRUCTION CONTRACTORS IN NIGERIA

SECTION A – YOUR PARTICULARS AND GENERAL INFORMATION
Please enter your name, position and the details of your organisation.
All responses will be confidential and will not be connected in any way to yourself
or your organisation.

Name (Optional): _____

Position/Profession: _____

Organisation: _____

Years of Experience: _____

Telephone: _____

Postal Address: _____

Email: _____
Q1: When was your company established? *(Please write in the box)*

☐

Q2: How many employees are there in your company at inception of the company? *(Please enter the numbers).*

	OFFICE STAFF		SITE STAFF	
	Male	Female	Male	Female
Full-time				
Part-time				
Total				

Q3: How many employees are there in your company now? *(Please enter the numbers).*

	OFFICE STAFF		SITE STAFF	
	Male	Female	Male	Female
Full-time				
Part-time				
Total				

Q4. What type of construction works does your company undertake? *(Please enter approximate percentage %).*

TYPE OF CONSTRUCTION WORK		APPOXIMATE PERCENTAGE
Building Construction		
Civil Engineering		
Heavy Engineering		
Other (Please Specify)		

Q5: What contractor classification does your company belong to? *(Please write in the box)*

Q6: What was your company's approximate annual turnover for the last full financial year? *(Please tick)*

TURNOVER	Tick (√)	TURNOVER	Tick (√)
Less than =N=2,000,000.00		Greater than =N=10,000,000.00 but not exceeding =N=15,000,000.00	
Between =N=2,000,000.00 and =N=5,000,000.00		Greater than =N=15,000,000.00 but not exceeding =N=20,000,000.00	
Greater than =N=5,000,000.00 but not exceeding =N=10,000,000.00		Greater than =N=20,000,000.00	

Q7: Which association(s) does your company belong to? *(Please write in the box)*

SECTION B

Q8: Which of the following statements apply to your organisation in relation to health and safety? *(Please tick and/or write)*

We have no specific budget for health and safety			
We have a health and safety budget		Please state budget amount in 2013	

Q9: In your opinion, how well do your procedures meet the requirements of the following? *(Please tick)*

REQUIREMENT	COMPLE TELY	PARTIA LLY	NOT AT ALL	UNDECI DED
Factory's Act 1990				
Workmen's Compensation Act				
Labour Safety and Welfare Law 2012				

National Environmental Standards & Regulations Enforcement Agency (NESREA) Act, 2007				
FEPA Decree No. 58 of 1988 & Act 1990; 1991				
Public Health Act 1990				
Fire Service Regulation 1988				
Others (Please state below):				

Q10: If a serious accident happens on your site which institutions will you report to? *(Please tick)*

Factory Inspectorate Department	
Occupational Health Unit	
Labour Department	
VIO Office	
Federal Road Safety Corps Office	
None	
Other (Please specify)	

Q11: How many accidents have occurred in your business in the year 2013? *(Please write in or tick the cells below)*

SEVERITY OF INJURY	FIGURE	NO RECORD
Minor injuries requiring less than one day off work		
Injuries requiring one to three days off work		
Four or more days off work including strains, sprains, lacerations etc resulting in four or more days off work		
Fatal injuries		

Q12: Please indicate the extent to which your company registers its construction sites with the Factories Inspectorate Department? *(Please tick)*

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All project sites are registered		Some project sites are registered	
Most of our project sites are registered		None of the sites are registered	

Q13: If you register some of your projects as indicated in question ten (Q10) above, please explain why it is done.

Q14: It is important in this study to know the processes you have in place for managing health and safety. *(Please indicate by ticking the relevant cells if you carry out the procedures stated below)*

COMPANY COMMITMENT			
Formal health and safety policy		Procedures for investigating accidents and nearmisses	
Designated safety person		Procedures for reporting accidents	
Using outside health and safety consultants		Provision of drinking water on site	
Provision of canteen service on site		Provision of cloak and toilet	
Provision of first aid box		Provision of personal protective equipment	
Safety record keeping and follow-ups		Adequate work space and neat environment	
Fire protection programme		Implementing employee drug testing	
Use of ISO 26000		Minimization of cost of ill-health and injury	

WORKER CONSULTATION AND PARTICIPATION			
Our workers participate in hazard identification on sites		We consult trade union representatives on health and safety matters	
We reward workers who demonstrate exemplary safe behaviour on site		We ask workers for their ideas on health and safety matters	

COMMUNICATION			
Using health and safety posters and other signs to give safety education		Networking with other companies/institutions	
Discussing health and safety during site meetings		Communicating health and safety performance to employees	
Verbal communication with operatives during site tours		Communicating health and safety through company newsletter	
Communicating safety value to corporate stakeholders and Two-way safety communication		Focusing of monthly safety meetings on employees' attitudinal change towards safety	

HEALTH AND SAFETY PLANNING			
We obtain a labour certificate for every contract		Document method statements	
Document risk assessments		Pricing health and safety in preliminaries	
Identification of hazards on sites before work commences		Disciplinary measures to correct wrong behaviours relating to health and safety	
Insurance cover for sites and Employer-paid group insurance plan		Ensuring adequate welfare provisions on site	
Post-accident investigation		Emergency response plan	
Job hazard analysis		Safety pre-task planning	

EDUCATION AND TRAINING			
Site inductions for operatives		Toolbox talks	
Planned health and safety training and retraining for supervisors and/or senior management		Planned health and safety training of operatives - first aid, manual lifting etc.	
Orientation on safety for new workers		Alcohol- and substance-abuse programme	

MONITORING AND REVIEW

Setting health and safety performance targets		Carrying out site inspections	
		Formal safety inspection per month	

Q15: What difficulties do you face in the management of construction site health and safety? *(Please use a separate sheet if necessary)*

Q16: What are your suggestions for helping contractors to manage construction site health and safety more effectively to minimize the incidence of ill health and accidents on construction sites? *(Please use a separate sheet if necessary)*

Q17: Does your company have a health and safety policy?

YES	
NO	

Q18: If you answered yes to question 17 (Q17) above, please it would be gratefully appreciated if a copy could be returned with the completed questionnaire.

Thank you very much for your co-operation.

For further enquiries please contact:
SHITTU, Abdullateef Adewale
Department of Quantity Surveying
Ahmadu Bello University,
Zaria – Nigeria.
+234) 8034767554, 8054871781
Email: funsho@futminna.edu.ng or aishatabdulahi2007@yahoo.com

Questionnaire for Main Survey

COVERING LETTER ON QUESTIONNAIRE SURVEY

Dear Sir/Madam,

**Research into the influence of organizational characteristics on health and
safety performance of small and medium-sized construction contractors in
Nigeria**

I am writing to request you to take part in a PhD research project, which aims to
evaluate the influence of organizational characteristics on health and safety
management within construction Small and Medium-sized Enterprises (SMEs) in
Nigeria with a view to developing a framework for improving health and safety
performance. The research is being carried out at the Department of Quantity
Surveying, Ahmadu Bello University, Zaria – Nigeria under the supervision of Dr.
A. D. Ibrahim, Dr. Y. M. Ibrahim and Dr. K. J. Adogbo.

As part of this research, a survey is conducted which is examining the health and
safety practices of small and medium-sized construction businesses. It would be
greatly appreciated if you would return the completed questionnaire in the enclosed
self-addressed envelope. I would be very happy to supply you with a copy of the
results of the study if you would like them.

Yours faithfully,

SHITTU, Abdullateef Adewale (Project Researcher).

INFLUENCE OF ORGANIZATIONAL CHARACTERISTICS ON HEALTH AND SAFETY PERFORMANCE OF SMALL AND MEDIUM-SIZED CONSTRUCTION CONTRACTORS IN NIGERIA

SECTION A – YOUR PARTICULARS AND GENERAL INFORMATION

Please enter your name, position and the details of your organization.
All responses will be confidential and will not be connected in any way to yourself or your organization.

Name (Optional): _____

Position: _____

Organization: _____

Years of Experience: _____

Telephone: _____

Postal Address: _____

Email: _____

SECTION B – ORGANIZATIONAL CHARACTERISTICS OF FIRM

Q1: When was your company established? *(Please write in the box)*

Q2: How many employees were there in your company from 2009 till date?
(Please tick in the boxes provided below).

NUMBER OF EMPLOYEES	2009	2010	2011	2012	2013	2014
Not more than 30 employees						
31 - 70 employees						
71 - 200 employees						
Greater than 200 employees						

Q3. What type of construction work does your company undertake? *(Please enter approximate percentage % in the box below).*

TYPE OF CONSTRUCTION WORK	APPOXIMATE PERCENTAGE
Building Construction	
Civil Engineering	
Others (Please Specify)	

Q4: Which of the Contractors Association is your company registered with? *(Please tick in the box below)*

CONTRACTORS' ASSOCIATION	TICK (√)
Construction and Civil Engineering Employers Association of Nigeria (CCEEAN)	
Federation of Building and Civil Engineering Contractors (FOBACEC	
Federation of Construction Industry (FOCI)	
Licensed Electrical Contractors Association of Nigeria (LECAN)	

Q5: What was your company's approximate turnover for the past five years? *(Please tick)*

TURNOVER	2009	2010	2011	2012	2013
Less than =N=2,000,000.00					
Between =N=2,000,000.00 and =N=5,000,000.00					
Greater than =N=5,000,000.00 but not exceeding =N=10,000,000.00					
Greater than =N=10,000,000.00 but not exceeding =N=15,000,000.00					
Greater than =N=15,000,000.00 but not exceeding =N=20,000,000.00					
Greater than =N=20,000,000.00					

Q6: Please tick from the options below the nature of your firm's origin based on the Public Procurement Act 2007 Classification.

ORIGIN OF FIRM	Wholly Indigenous	Partly Indigenous	Foreign
RESPONSE (√)			

Q7: What is the geographical spread of your firm in terms of scope of operation? *(Please tick)*

SCOPE OF OPERATION	MULTINATIONAL	NIGERIAN		
		National	Regional	Local
RESPONSE (√)				

SECTION C: FIRMS' HEALTH & SAFETY MANAGEMENT PRACTICES

Q8: Does your company have a health and safety policy? *(Please tick)*

YES	NO

* If you answered yes to question 8 (Q8), please it would be greatly appreciated if a copy could be returned with the completed questionnaire.

Q9: Does your company have specific budget for health and safety? *(Please tick)*

YES	NO

Q10. If you answered yes to question 9 (Q9), please state the budget amount for a five-year period. *(Please write in the box below)*

YEAR	2009	2010	2011	2012	2013
HSE BUDGET AMOUNT (=N=)					

Q11: How many accidents have occurred annually in your business from 2009 - 2013? *(Please write in the boxes below)*

SEVERITY OF INJURY	FIGURE				
	2009	2010	2011	2012	2013
Minor injuries requiring less than one day off work					
Injuries requiring one to three days off work					

Four or more days off work including strains, sprains, lacerations etc. resulting in four or more days off work					
Fatal injuries causing permanent disability or death of employee					

Q12: In your opinion, how well do your health & safety procedures meet the requirements of the following? *(Please tick in the boxes below)*

REQUIREMENT	COMPLETELY (3)	PARTIALLY (2)	NOT AT ALL (1)
Health, safety & welfare provisions in Factory's Act 1990			
Health, safety & welfare provisions in Workmen's Compensation Act			
Health, safety & welfare provisions in Labour Safety and Welfare Law 2012			
Health, safety & welfare provisions in National Environmental Standards & Regulations Enforcement Agency (NESREA) Act, 2007			
Health, safety & welfare provisions in Public Health Act 1990			
Health, safety & welfare provisions in conditions of contract			
Others (Please state below):			

Q13: If a fatal accident (i.e., involving death, severe injury or permanent disability) happens on your site which institutions do you report to? *(Please tick in the boxes below)*

Factory Inspectorate Department of Ministry of Labour and Productivity	
Labour Department of Ministry of Labour and Productivity	
Occupational Health Unit of Ministry of Health	
Federal Road Safety Corps Office	
None	
Other (Please specify)	

Q14: Please indicate the extent to which your company registers its construction sites with the Factories Inspectorate Department? *(Please tick in the boxes below)*

All project sites are registered **(100%)**		Some project sites are registered **(< 50%)**	
Most of our project sites are registered **(≥ 50%)**		None of the sites are registered **(0%)**	

Q15: If you don't register your projects as indicated in question 14 (Q14) above, please explain why it is not done. *(Please write in the boxes below)*

Q16: How well does your company meet up with or provide (i.e. implement) the following health and safety procedures or practices. *(Please tick in the boxes below)*

COMPANY COMMITMENT	COMPLETE LY (3)	PARTIALLY (2)	NOT AT ALL (1)
Existence of formal health and safety policy			
Having a designated safety personnel			
Using outside health and safety consultants			
Provision of canteen service on site			
Provision of first aid box			
Keeping of safety record keeping and follow-ups			
Having fire protection programme			
Use of ISO 26000 to identify social responsibilities of employees			
Provision of procedures for investigating accidents and nearmisses			
Provision of procedures for reporting accidents			
Provision of drinking water on site			
Provision of cloak and toilet			
Provision of personal protective equipment			
Provision of adequate work space and neat environment			
Implementing employee drug testing			
Existence of minimization policy for cost of ill-health and injury			

WORKER CONSULTATION AND PARTICIPATION	COMPLETELY (3)	PARTIALLY (2)	NOT AT ALL (1)
Involving workers to participate in hazard identification on sites			
Rewarding workers who demonstrate exemplary safe behaviour on site			
Consulting trade union representatives on health and safety matters			
Asking workers for their ideas on health and safety matters			

COMMUNICATION	COMPLETELY (3)	PARTIALLY (2)	NOT AT ALL (1)
Using health and safety posters and other signs to give safety education			
Discussing health and safety during site meetings			
Using verbal communication with operatives during site tours.			
Communicating safety value to corporate stakeholders and use of two-way safety communication			
Networking with other companies/institutions			
Communicating health and safety performance to employees			
Communicating health and safety through company newsletter			
Focusing your monthly safety meetings on employees' attitudinal change towards safety			

HEALTH AND SAFETY PLANNING	COMPLETELY (3)	PARTIALLY (2)	NOT AT ALL (1)
Obtaining a labour certificate for every contract			
Documenting risk assessments			
Identifying hazards on sites before work commences			

	COMPLETELY (3)	PARTIALLY (2)	NOT AT ALL (1)
Providing insurance cover for sites and Employer-paid group insurance plan			
Carrying out post-accident investigation			
Providing job hazard analysis			
Documenting method statements			
Price health and safety in preliminaries			
Exercising disciplinary measures to correct wrong behaviours relating to health and safety			
Ensuring adequate welfare provisions on site			
Providing emergency response plan			
Carrying out safety pre-task planning			

EDUCATION AND TRAINING	COMPLETELY (3)	PARTIALLY (2)	NOT AT ALL (1)
Organizing site inductions for operatives			
Organizing health and safety training and retraining for supervisors and/or senior management			
Organizing orientation on safety for new workers			
Organizing toolbox talks			
Organizing health and safety training of operatives - first aid, manual lifting etc.			
Organizing alcohol- and substance-abuse programme			

Q17: What difficulties do you face in the management of construction site health and safety? *(Please use a separate sheet if necessary)*

Q18: What are your suggestions for helping contractors to manage construction site health and safety more effectively to minimize the incidence of ill health and accidents on construction sites? *(Please use a separate sheet if necessary)*

Thank you very much for your co-operation.
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Tel (+234) 8034767554, 8054871781
Email: funsho@futminna.edu.ng or aishatabdulahi2007@yahoo.com

Provision of First Aid Box on Sites

Health & Safety Procedures on Construction Sites

FIRM/SITE	H&S POLICY	H&S BUDGET	SITE AMBULANCE	CONTENT OF FIRST AID BOX							
				Antiseptic cream	Bandages	Cotton wool	Gauze	Plasters	Bowl	Iodine	Scissors
A	x	x	X	x	x	x	x	x	x	x	x
B	x	x	X	x	x	x	x	x	x	x	x
C	x	x	X	x	x	x	x	x	x	x	x
D	√	√	X	√	√	√	√	√	√	√	√
E	√	√	X	√	√	√	x	√	√	√	√
F	√	x	X	√	√	√	x	x	x	x	√
G	x	x	X	x	x	x	x	x	x	x	x
H	√	√	X	√	√	√	√	√	√	√	√
I	√	√	X	√	√	√	√	x	√	√	√
J	x	x	X	x	x	x	x	x	x	x	x
K	√	√	X	√	√	√	√	√	√	√	√
L	√	√	X	√	√	√	x	x	x	√	√
M	√	√	X	√	√	√	x	x	√	√	√
N	√	√	X	√	√	√	√	√	√	√	√
O	√	√	X	√	√	√	x	x	x	√	√
P	√	√	X	√	√	√	√	x	√	√	√
Q	x	x	X	x	x	x	x	x	x	x	x
R	√	√	X	√	√	√	√	√	√	√	√
S	√	√	X	√	√	√	x	√	√	√	x
T	√	√	X	√	√	√	√	√	√	√	√
U	x	x	X	√	√	√	√	√	√	√	√

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