

PROCEEDING 13



ASSESSMENT OF LEVEL OF IMPLEMENTATION OF HEALTH AND SAFETY REQUIREMENTS IN CONSTRUCTION PROJECTS EXECUTED BY SMALL FIRMS IN ABUJA

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ABSTRACT

The construction industry is a significant player in the economy of developing nations. Yet, it is one of the most hazardous with frequent accidents and ill-health related problems. This research assessed the level of implementation of health and safety (H&S) management requirements in construction projects executed by Small firms in Nigeria. The rationale for this was to address the problem of poor H&S management within the construction firms. The study specifically identified the major organizational characteristics which influence the H&S management of small construction firms in Nigeria. This was done with a view to assessing the main health and safety management requirements adopted by construction firms with different organizational characteristics. Data collection was done using well structured questionnaires. Research population constituted 40 small construction firms in Abuja. Analyses of data were done using percentage and relative importance index (RII). The study identified 58 H&S management practices/requirements out of which provision of first aid facilities on site (RII = 0.92) was the most important, while 45 others were also discovered to be important. It was discovered that construction firms with larger employees' size, larger turnover and greater years of experience implement H&S requirements more completely than those with lesser employees' size, annual turnover and years of experience. Civil engineering contractors were observed to have higher level of implementation of the H & S requirements than building contractors. The need for construction SMEs to fully implement these important H&S management practices to improve H&S performance on site was therefore emphasized.

Keywords: accidents, hazards, health and safety management, risks, small construction firms.

INTRODUCTION

The construction industry plays a major role in the economies of developed and developing countries. It is the next employer of labour after agriculture in developing countries; it employs about 10% of labour force (Okeola, 2009). It is however worrisome that it is a major contributor to the occupational accidents and ill-health records. In 2012, the construction industry contributed 3.01% of the total Gross Domestic Product (GDP) to the Nigerian economy (National Bureau of Statistics, 2012) but recorded 13% of occupational fatalities (Diugwu, Baba & Egita, 2012).

Contractors occupy a significant position and are regarded as the major players in the construction industry. Researchers regard them as one of the most important

Odediran et al (2013) identified five organizational characteristics similar to that of Dada et al (2012) and they are firm's size (which was determined using annual turnover, staff strength and equipment capacity), area of specialization (which was grouped in to building, civil and industrial/heavy engineering), type of client (which was grouped in to public, federal ministries/parastatals, state ministries/parastatals, local governments, private individual/institutions, international agencies and Non Governmental Organizations), business type (which was grouped in to build only, design & build or package deal, design, build & finance and design, build & operate), project funding arrangement (which was grouped in to bank loans, retained earnings, share capital and mobilization) and years of experience of firm.

This study is therefore making use of the more frequently used organizational characteristics to define the distinguishing features of the Nigerian construction SMEs. These are years of experience, type of business, size of firm, number of employees, firm's annual turnover and origin of firms.

Health and Safety Management Practices of Construction Firms

Previous studies have shown that certain practices can lead to improved health and safety performance and therefore constitute good health and safety practices. These findings as summarized by Kheni (2008) and findings from other studies are presented in Table 1. Some health and safety practices are required by health and safety legislation to be implemented on construction sites in some countries. For instance worker involvement in health and safety, training in health and safety, and health and safety committees, are covered by health and safety regulations in the UK and are also covered in Nigerian safety regulations.

Table 1: Summary of Researches on H&S Management Practices

Year and Authors	Summary of Research	Health and Safety Management Practices
Leska et al. (1993) cited in Kheni (2008)	Identified zero accident techniques.	Identified the following to be associated with safety success: <ul style="list-style-type: none"> * safety training and orientations; * provision of safety incentives; * safety pre-task planning included in safety goals; * safety person or personnel * safety policies and procedures; fire protection programme; *accountability/responsibility and safety budget; * alcohol and substance-abuse programme in place; * accident and near-miss investigation, and; * record keeping and follow-ups.
Jaselskis et al. (1996) cited in Kheni (2008)	Strategies for achieving excellence in construction safety performance	Companies with lower recordable incidence rates were characterized by the following: <ul style="list-style-type: none"> * more detailed safety programmes; * expended large percentage of revenue on safety programmes; * greater safety training time; * more formal safety inspections per month; and; * more safety meetings.
Gallagher (1997) cited in Kheni (2008)	Identified factors associated with improved health and safety	The study identified the following factors to be associated with better health and safety performance: <ul style="list-style-type: none"> * high level of top management commitment;

	performance.	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.
Aksorn and Hadikusumo (2008) cited in Khem (2008)	Investigated the effectiveness of safety programmes in the construction industry.	Safety performance was found to be influenced by the nature of the implemented programmes. Particular elements of safety programmes found to be positively associated with safety performance included: * accident investigations; * jobsite inspections; * job hazard analysis; * safety inductions; * safety record keeping; * safety committees; * safety incentives, and, * control of subcontractors.
Idoro (2011)	Studied the influence of mechanization on OHS performance of the Nigerian Construction Industry.	Mechanization was discovered to have the tendency to worsen OHS performance of the construction industry when not properly managed. It was then 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.	It was concluded that integrating safety and social responsibility in construction activities results in better corporate performance. The following were suggested as linking factors between 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 organizational performance.	The organizational cultural factors identified to be improving employees safety performance at work are: * 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.
Agumba and Haupt (2014)	Examined the validity and reliability of H&S practices and respondents demographic attributes perception on these H&S practices implementation of South African construction SMEs	It was established that management commitment & involvement, employee involvement & empowerment, project supervision, project H&S planning & communication and H&S resources & training are valid health and safety practices for improving health & safety performance of construction SMEs.

The health and safety management practices shown in Table 1 can be categorized into five core practices. These are company's commitment, health and safety planning, workers' involvement, education and training and communication. These practices are capable of improving the health and safety performance of construction contractors. The core health and safety management practices can be

made to better improve the performance of contractors. This can be done by identifying the important practices under them and laying more emphasis on these important practices.

The study's background and reviews of literature revealed that health and safety researches in developing countries, especially in Nigeria, have not properly addressed the issue of safety practices of construction contractors in relation to firms' organizational characteristics to promote good health and safety management practices for improving health and safety performance. In order to develop a good background to bridge this gap, this study specifically assessed the implementation level of main health and safety management practices/requirements adopted by the construction firms with different organizational characteristics.

METHODOLOGY AND DATA COLLECTION

This research employed the use of both primary and secondary sources to collect data. Questionnaires were designed and distributed to professionals to gather data from the primary source while a wide ranging review of literature using journal articles and other published books was used to collect data from the secondary source. The questionnaire was designed using a well-structured format. The category of contractors studied in this research is the small construction firms who are majorly national contractors and are also sizeable in population.

Population for the research constitutes the number of construction firms in Abuja registered with the Federation of Construction Industry in Nigeria (FOCI) from where samples were drawn. FOCI has 83 Registered Construction firms in Nigeria out of which 40 operate in Abuja. Based on this the population for the study was therefore 40. For the purpose of this research it was not necessary to adopt any special method to select members from the target group since all the members of the target group were used. Watson (2001) makes this justifiable by reporting 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 a sample.

Tables and bar charts were employed to present the data extracted from the questionnaires administered. Analysis of data was carried out using relative importance index (RII) and percentages to determine the level of importance and implementation of the identified health and safety management practices/requirements adopted by Nigerian small construction firms. The analyses were carried out with the aid of Microsoft Excel Software Package. Conclusions and recommendations made at the end of this research were based on the research findings and from analysis of the interview suggestions made by the respondents.

DATA ANALYSIS, PRESENTATION AND DISCUSSION OF RESULTS

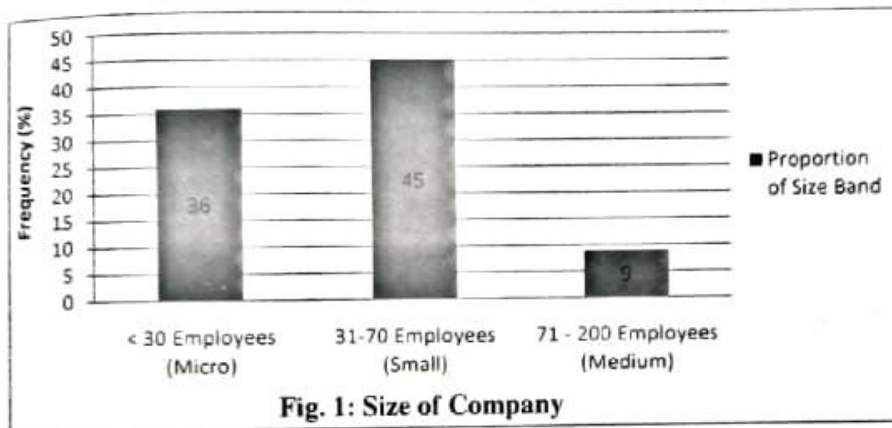
Analysis of Response Rate to Questionnaire

The selected construction firms were self-administered well-structured questionnaires by the researcher and also with the help of a research assistant. Out of the 40 questionnaires administered, 36 were received and finally only 31 were found to be useable because 5 of the respondents were discovered to be large size

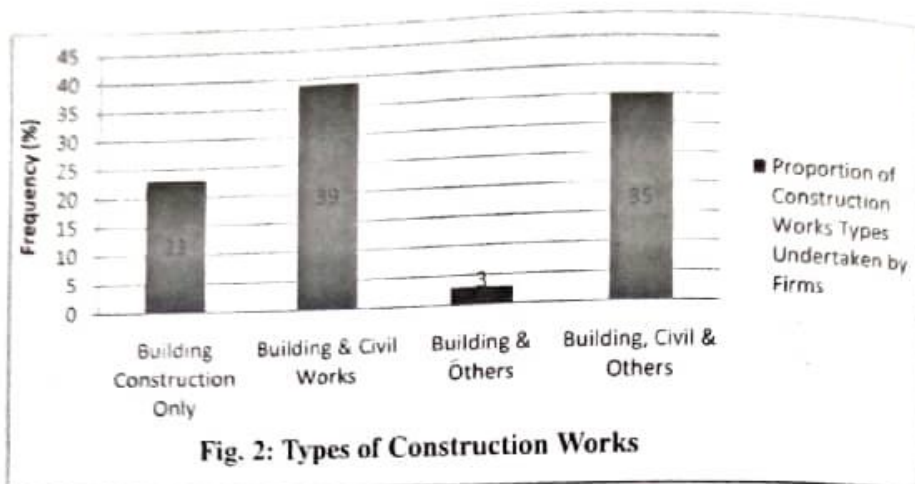
construction firms based on their size band and annual turnover. The response rate was therefore 77.5% which is a good response rate.

Respondents' Profile

It was revealed from Figure 1 that 36% of the respondents are micro enterprise contractors with a size band of less than 30 employees. 45% of the respondents have a size band of 31 to 70 employees and are small-scale contractors which constitute the majority of the respondents. The respondents with the size band of 71 - 200 employees constitute 19% of the respondents and are medium-sized contractors. These imply that majority of the respondents (micro = 36%; small = 45%; and total = 81%) are small construction firms.



From Figure 2 it was observed that majority of the respondent constituting 39% undertake Building and Civil Engineering works. The construction firms observed to be undertaking Building, Civil Engineering and other types of construction works constitute 35% of all respondents. 23% of the respondents undertake Building Construction works. On 3% of the respondents were shown to undertake Building and other types of construction works.



DATA ANALYSIS AND DISCUSSIONS

Analysis of Literature Findings

From the review of literature four major organizational characteristics were discovered. These were used to analyse the level of implementation of the main health and safety management practices/requirements identified from literature review.

These organizational characteristics are firms' number of employees, types of business, years of experience of employees of firm and firms' annual turnover. The review of literature from the study reveals that 58 health and safety management practices/requirements are adopted by the construction firms in Nigeria to control the risks of hazards on construction sites. These health and safety practices vary between Provision of first aid facilities on site, which is the most important health and safety management practice adopted, and employment of higher percentage of married workers, which is the least important health and safety management practice adopted by Nigerian construction SMEs to control the risks of hazards on construction sites. These health and safety management practice are generally categorized under five core practices. These are company commitment, worker consultation & participation, communication, health & safety planning and education & training.

The review of literature revealed that 58 health and safety management practices are adopted by construction SMEs to control the risks of hazards on construction sites. These health and safety practices vary between Provision of first aid facilities on site, which is the most important health and safety management practice adopted, and employment of higher percentage of married workers, which is the least important health and safety management practice adopted by Nigerian small construction firms in controlling the risks of hazard on site. The results of the RII showing the identified health and safety management practices, in order of importance, are presented in Table 2. Only the important health and safety management practices are presented in Table 2 in order to conserve space in the paper.

Table 2. Ranking of Important Health and Safety Practices

SNO	COMPANY'S COMMITMENT	RII	RANK
1	Provision of first aid box	0.92	1st
2	Provision of personal protective equipment	0.88	2nd
3	Keeping of safety record keeping and follow ups	0.88	3rd
4	Provision of procedures for investigating accidents and nearmisses	0.87	4th
5	Existence of formal health and safety policy	0.86	5th
6	Provision of adequate work space and neat environment	0.84	6th
7	Having a designated safety personnel	0.84	7th
8	Having fire protection programme	0.84	7th
9	Provision of cloak and toilet	0.82	9th
10	Provision of procedures for reporting accidents	0.79	10th
11	Using outside health and safety consultants	0.78	11th
12	Existence of minimization policy for cost of ill health and injury	0.83	12th
13	Provision of drinking water on site	0.76	13th
14	Provision of canteen service on site	0.74	14th
15	Use of ISO 26000 to identify social responsibilities of employees	0.74	14th
16	Implementing employee drug testing	0.71	16th
	HEALTH AND SAFETY COMMUNICATION	RII	Rank
17	Using health and safety posters and other signs to give safety education	0.88	1st
18	Using verbal communication with operatives during site tours	0.88	1st
19	Communicating safety value to corporate stakeholders and use of two-way safety communication	0.84	3rd
20	Discussing health and safety during site meetings	0.83	4th
21	Communicating health and safety performance to employees	0.83	4th
22	Focusing your monthly safety meetings on employees' attitudinal change towards safety	0.83	4th
23	Networking with other companies/institutions	0.78	7th
24	Communicating health and safety through company newsletter	0.70	8th
	HEALTH AND SAFETY PLANNING	RII	Rank
25	Identifying hazards on sites before work commences	0.90	1st
26	Providing job hazard analysis	0.90	1st
27	Documenting risk assessments	0.88	3rd
28	Carrying out post-accident investigation	0.87	4th
29	Price health and safety in preliminaries	0.85	5th
30	Carrying out safety pre-task planning	0.85	5th
31	Documenting method statements	0.84	7th
32	Exercising disciplinary measures to correct wrong behaviours to H&S	0.83	8th
33	Providing emergency response plan	0.81	9th
34	Providing insurance cover for sites and Employer-paid insurance plan	0.77	10th
35	Ensuring adequate welfare provisions on site	0.74	11th
36	Obtaining a labour certificate for every contract	0.70	12th
	WORKERS' CONSULTATION AND PARTICIPATION	RII	Rank
37	Rewarding workers who demonstrate exemplary safe behaviour on site	0.84	1st
38	Asking workers for their ideas on health and safety matters	0.80	2nd
39	Involving workers to participate in hazard identification on sites	0.80	2nd
40	Consulting trade union representatives on health and safety matters	0.78	4th
41	Organizing health and safety training and retraining for supervisors and senior management	0.88	1st
42	Organizing orientation on safety for new workers	0.88	1st

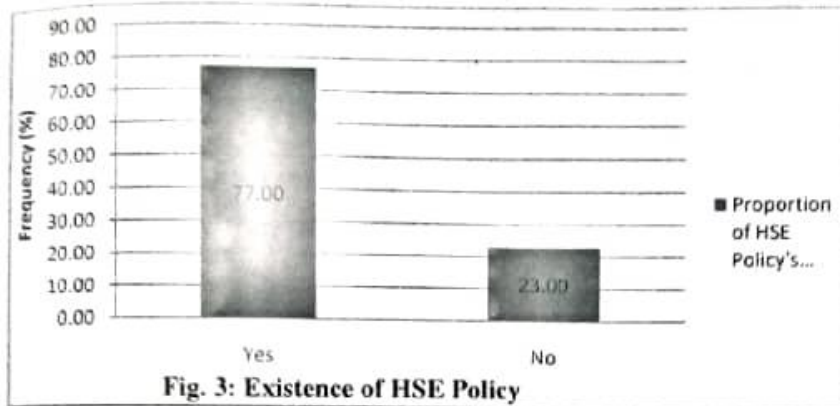
43	Organizing health and safety training of operatives - first aid, manual lifting etc	0.88	1st
44	Organizing site inductions for operatives	0.86	4th
45	Organizing toolbox talks	0.74	5th
46	Organizing alcohol- and substance-abuse programme	0.74	5th

Table 2 revealed 46 important health and safety (H&S) practices under 5 major or core H&S practices. These are *company's commitment*, *workers' consultation and participation*, *H&S communication*, *H&S planning* and *H&S education and training*. Twelve important H&S practices were identified under company's commitment with RII ranging between 0.92 and 0.71. The practices here range from *provision of first aid box* which is the highest ranked (0.92) to *implementation of employee drug testing* which is the least ranked (0.71). Four important H&S practices were identified under workers' consultation and participation. These range between *rewarding workers who demonstrate exemplary safe behaviour on site* with RII of 0.81 and *consulting trade union representatives on health and safety matters* with RII of 0.78. H&S communication comprises of 8 important H&S practices ranging from *using health and safety posters and other signs to give safety education* (RII = 0.88) to *communicating health and safety through company newsletter* (RII = 0.70). The twelve important H&S practices discovered under H&S planning range between *identifying hazards on sites before work commences* (RII = 0.90) and *obtaining a labour certificate for every contract* (0.70). The fifth core H&S practice which is H&S education and training has 6 important H&S practices ranging between *organizing health and safety training and retraining for supervisors and/or senior management* (RII = 0.88) and *organizing alcohol- and substance-abuse programme* (RII = 0.74).

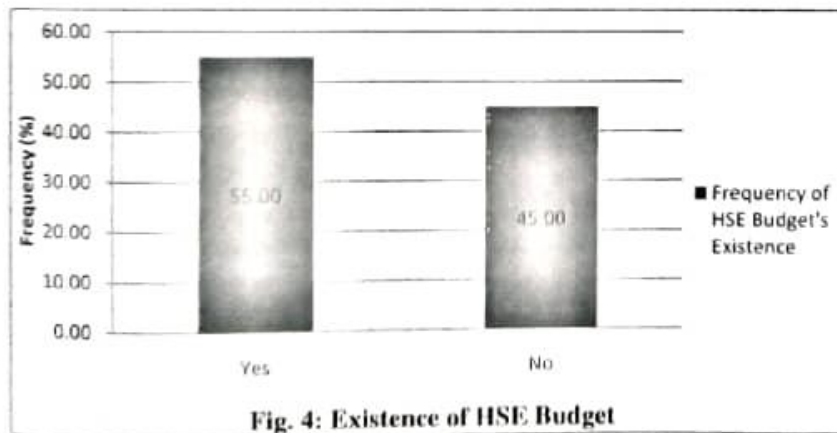
The finding of this study agrees with the studies of Kheni (2008), Idoro (2011), Agwu (2012(a) and (b)) and Agumba and Haupt (2014). Kheni (2008) used these health and safety practices to enhance the development of a framework for improving the health and safety performance of construction SMEs in Ghanaian construction industry. Idoro (2011) adopted some of these health and safety practices to enhance hazard management plan in the use of plant and equipment by construction contractors in the Nigerian construction industry. Agwu (2012(a)) used most of these health and safety practices to study the implications of integrating safety and social responsibility initiatives at the organizational level in the Nigerian construction industry. Agwu (2012(b)) identified most of these health and safety practices as organizational cultural factors capable of improving employees' safety performance at work. Agumba and Haupt (2014) identified most of these core health and safety practices as leading indicators which can be used to identify incidences before hand and put preventive measures in place. All these studies support the result of this study that the five core health and safety practices are important and capable of improving health and safety performance of contractors.

Analysis of Level of Implementation of Firms on Health and Safety Practices/Requirements

It was revealed from Figure 3 that 77% of the respondents have safety policy in place while 23% do not have safety policy in place, meaning that majority of the firms have safety policy in place for managing health and safety on site.



The respondents with safety budget were discovered to be 55% while 45% of the respondents do not have budget for health and safety (see Figure 4). This shows that majority of the firms prepare budget for health and safety but those that do not have safety budget also form a sizeable proportion of all the firms studied. Interestingly, some of the firms who claimed to have a safety budget did not state the budget amount.



Finally the study revealed that long established firms adhere more to health and safety rules on site. Construction firms with large number of employees are more health and safety conscious than firms with fewer number of employees. Firms with large turnovers are more likely to adopt good health and safety measures on site than those with small turnovers. Construction firms involved more in civil engineering works are likely to be more safety conscious than those involved more in building works. These findings are illustrated further in Figures 5 – 8.

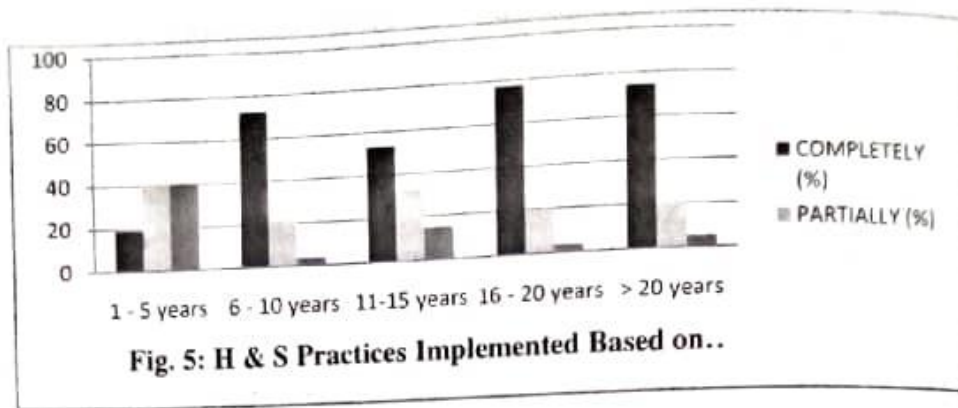


Figure 5 shows on the average that firms where employees have more years of experience completely implement the health and safety practices/requirements for managing construction sites in a safe manner identified more than firms where employees have lesser years of experience.

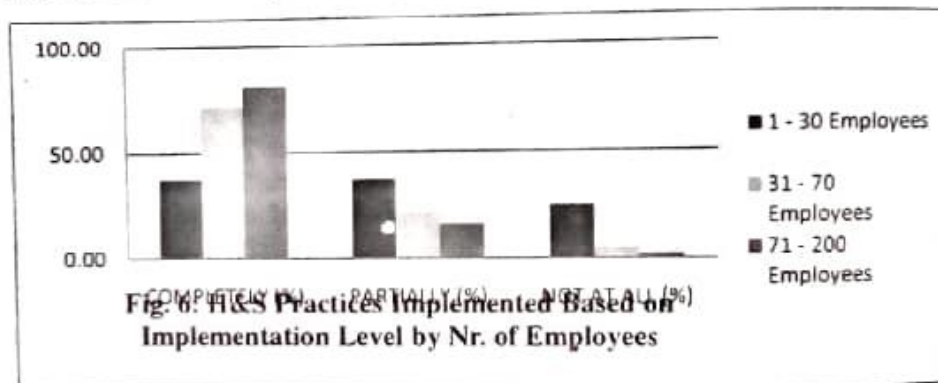


Figure 6 shows that on the average larger sized firms completely implement the health and safety practices/requirements for managing construction sites in a safe manner more than smaller sized firms.

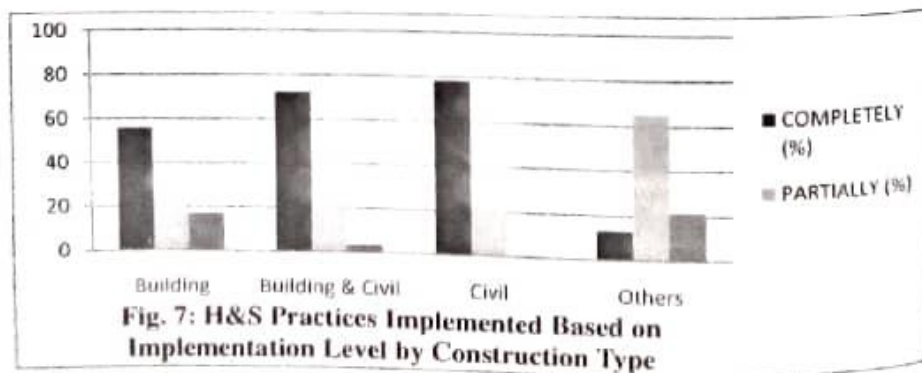
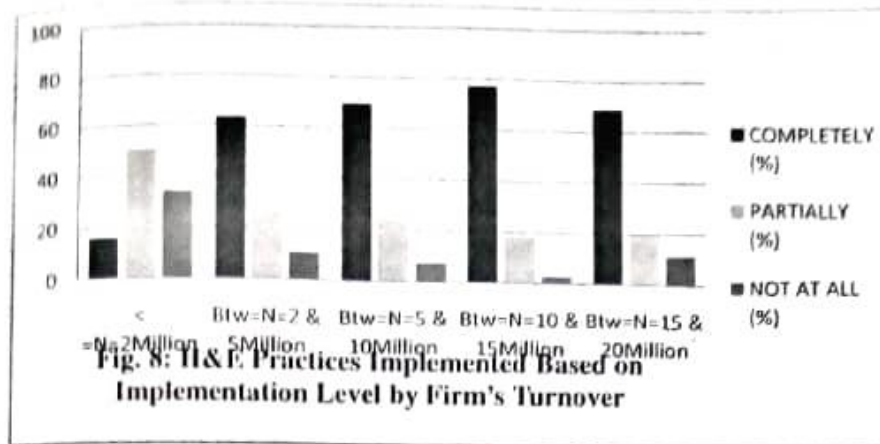


Figure 7 shows that civil engineering firms completely implement the health and safety practices/requirements for managing construction sites in a safe manner more than building construction and other types of construction firms.



It was revealed in Figure 8 that construction firms with larger turnover implement the required health and safety practices/requirements for managing construction sites in a safe manner more completely than construction firms with smaller turnover.

CONCLUSIONS

This study was carried out as a pilot study to an ongoing research work to examine the influence of organizational characteristics on the health and safety management of Nigerian construction SMEs with a view to suggesting ways of improving the health and safety performance of construction firms. A wide ranging review of literature relating to the theme of the aim and objectives of the study was done and data collection was carried out using questionnaires which were administered to 40 selected construction firms in Abuja. The following conclusions were made from the research findings:

- The study identified, from literature review, 58 health and safety management practices adopted by the Nigerian construction firms in controlling the risks of hazards on construction sites which were grouped in to company commitment, worker consultation & participation, communication, health & safety planning and education & training. 46 of these health and safety management practices were found to be important.
- Provision of first aid facilities on site is the most important health and safety practice while employment of higher percentage of married workers was the least important health and safety practice.
- Construction firms with few employees are less likely to adopt health and safety practices. Those with a large number of employees are likely to be health and safety conscious and adopt measures to control health and safety risks.
- Construction firms with small turnovers are less likely than their counterparts with large turnovers to adopt health and safety measures to control health and safety risks on sites.

- Civil engineering firms are more likely to adopt health and safety practices compared to building contractors.
- Long established firms are more likely to adopt health and safety measures than newer companies.

In the light of these, the construction firms need to be aware of these important health and safety management practices which can greatly control or minimize the risks of accidents and hazards to workers and visitors on construction sites. Government also needs to provide an implementable H&S framework comprising of standardized H & S checklist to differentiate the requirements of larger firms from the smaller firms.

The outcome of this research forms a good background for the larger study. This is because it forms a good basis for exploring the influence of organizational characteristics on health and safety management of construction firms.

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