



ISSN: 2682-6488

EDMIC²⁰¹⁹

DRIVERS & DYNAMICS OF CHANGE IN THE BUILT ENVIRONMENT

EDITORS

Olubola Babalola
Abel Olaleye
Samuel Olufemi Folagbade
Timothy Tunde Oladokun
Adewumi John Babafemi

20TH - 22ND MAY, 2019

FACULTY OF ENVIRONMENTAL
DESIGN & MANAGEMENT

OBAFEMI AWOLOWO UNIVERSITY
ILE-IFE, NIGERIA

- 77 Community - Driven Approach for Financing Infrastructure in Emerging Communities:
Exploring the Reality of Collective Action Theory
Job Taiwo Gbadegesin, Daramola Thompson Olapade, Robert Ereola Shiyanbola and Olutayo Isaac Ayorinde
- 94 Assessment of Claims on Delivery of Building Projects
Victor Adetunji Arowoia and Taiwo Fadeke Adegbenbo

SECTION 2:

CONSTRUCTION ECONOMICS AND MANAGEMENT [107 - 264]

- 109 Assessment of Local Construction Firms' Common Building Items of work Unit Rates in Nigeria
Olubimbola Oladimeji
- 121 Assessment of Time Loss on Tertiary Educational Construction Projects in Ondo State
Adedokun Deborah Oluwafunke and Ijeh Oriabure Treasure
- 128 An Appraisal of Lean Construction Methods Implementation by Construction Firms in Kaduna State, Nigeria
paul Ada Christiana, Yahaya Saminu Nazifi, Zaki Michael Yakubu and Jatau, Tchad Sharon
- 138 Assessment of Health and Safety Information on Construction Sites in Nigeria
Ranti Taibat Adebiyi, Olubola Babalola, Ganiyu Amuda-Yusuf and Shehu Abdulkadir Rasheed
- 149 Factors Influencing Construction Supply Chain Management Practice in Nigerian Construction Firms
Abiola Akolade Adegoke and Joshua Oluwasuji Dada
- 160 Risk Associated with Women Involvement in Construction Projects in Lagos State, Nigeria
Grace Kehinde Ojo and Esther Ilori Ebunoluwa
- 172 Barriers to the Proliferation of Green Building Projects in South Africa
Olusegun Aanuoluwapo Oguntola, dineo Ramorwalo, Clinton Aigbavboa, and Wellington Thwala
- 179 Construction Project Claim Management Process in Nigeria: Status, Barriers and Impact
Akeem Adunfe Ajayi, Olubola Babalola and Bamidele Mafimidiwo
- 191 Aspiration of Small and Medium Enterprise Construction Firms on Procurement Routes in South Africa
Abimbola Olukemi Windapo and Sunday Julius Odediran
- 202 Relationship Between Procurement Strategies and the Development of Small and Medium Enterprise Construction Firms in South Africa
Abimbola Olukemi Windapo, Oluseye Olugboyega and Sunday Julius Odediran

ASSESSMENT OF HEALTH AND SAFETY INFORMATION ON CONSTRUCTION SITES IN NIGERIA

Ranti Taibat Adebisi¹, Olubola Babalola², Ganiyu Amuda-Yusuf¹ and Shehu Abdulkadir Rasheed¹

¹Department of Quantity Surveying, University of Ilorin, Ilorin, Nigeria

²Department of Quantity Surveying, Obafemi Awolowo University, Ile-Ife, Nigeria

Authors' e-mails: *adebiyi.rt@unilorin.edu.ng, olubolalola@oauife.edu.ng, amuda.g@unilorin.edu.ng, rasheed.as@unilorin.edu.ng

ABSTRACT

This study identified and assessed health and safety information used on construction sites in Lagos State, Nigeria, with a view to enhancing effective communication among the site-operatives. Data for the study were collected from the site-supervisors and operatives working on construction sites in the study area. The sites of construction firms registered with Lagos State Public Procurement Agency under categories D and E were visited. Pilot survey revealed that there were 55 active construction firms that have on-going projects. The study therefore, adopted purposive sampling technique to identify these 55 active firms. On each site visited, a supervisor and 3 site-operatives were randomly selected from bricklayers, carpenters, iron benders, electricians, and plumbers working on the identified sites, depending on the stage of the work. This resulted into sample of 220. This consists of 55 supervisors and 165 site-operatives. The use of questionnaire was adopted for data collection. The total number of copies of questionnaire retrieved was 161, representing 73.1% response rate consisting of 22% from the supervisors and 78% from the site operatives. Information on health and safety used on construction sites were collected. Mean score (MS), standard deviation (SD) and analysis of variance technique were the analytical tools used. The results revealed that the most used health and safety information were first aid procedures with MS of 3.92, safety sign and symbols (MS = 3.89), use of protective equipment (MS = 3.75) and procedures for safe operation (MS = 3.69). There is no significant difference between the ranking of these information from both supervisors and operatives. This implied that the respondents concurred in their independent opinion regarding the usage of health and safety information. The study concluded that safety of construction site-operatives depended on health and safety information made available by the contracting firms.

Keywords: Construction sites, Health and safety, Information, Operatives, Supervisors.

INTRODUCTION

Accidents and ill health are common problems on construction sites. These are of grave concern to both practitioners and researchers all over the world. Construction site has been regarded as the most hazardous place to work with high level of health and safety risks (Phoya, 2012; Vitharana, De Silva and De Silva, 2014). Occupational health and safety statistics presented by different researchers have revealed that, the injury and fatality rate on construction sites is very high in comparison with other industries in the majority of countries (Okolie and Okoye, 2014; Umeokafor, Isaac, Jones and Umeadi 2014; Okoye, Ezeokonkwo and Ezeokoli 2016). In Nigeria, information made available by Inspectorate Division of Federal Ministry of Labour and productivity indicated that the Nigerian construction industry is responsible for about 7.5% of all occupational accidents. Limited information about accidents on construction sites in Nigeria was confirmed by Okolie and Okoye (2014) owing to the fact that majorities of the accidents were not reported.

The occurrence of accidents on construction sites usually leads to site closure for investigation, loss of man/machine hours, loss of output, loss of corporate reputation, payment of burial expenses/compensation/insurance claims for the dead (Kumar and Bansal 2013; Kolo, 2015). Findings from studies carried out to assess the causes of these accidents have pointed to poor information on health and safety (Kwofie, 2015; Akunyumu, 2016). Ulang (2012) and Adebiyi (2018) attributed causes of accidents on construction sites to limited knowledge of health and safety information such as regulatory requirement, nature of hazards, safe working practices and accident preventive measures. Inadequate provision of health and safety information is cited as being prevalent among project participants resulting in considerable amount of accidents and injuries on construction sites (Ahadzie and Amoa-Mensa, 2010; Ibem, Anosike and Azuh, 2011). Provision of health and safety information for the parties involved in construction activities has been argued to be a focal point for reducing accidents and ill-health problems on construction sites (Phoya, 2012). Garcia, Arditi and Le (2014) also confirmed the importance of information on health and safety on construction sites. According to Bandulahewa (2015), communication of health and safety information has not been given the needed attention by contractors on construction sites which has often result to accidents. According to Landin and Kindahl (2013), information on health and safety on construction sites are very sensitive and needs more attention. This study therefore aims at examining health and safety information available on construction sites with a view to enhancing effective communication among the construction team.

LITERATURE REVIEW

Health and Safety Information

In the modern construction environment, information on health and safety is a very sensitive management responsibility (Neale, 2013). Agwu and Olele (2014) noted that information on health and safety is a performance-oriented approach to construction by establishing a safe working environment that is consistent with peak performance and continuous improvement. Adeogun and Okafor (2013) reported that the perspectives of most industries and organizations show that the stage of health and safety is still at infancy in Nigeria due to management attitudinal behaviour, lack of safety culture, poor communication of health and safety information and non-implementation of health and safety policies. In addition, only big multinationals recognize health and safety and run the policies as constituted in their parent countries of origin (Adeogun and Okafor 2013).

Preece and Stocking (1999) pointed out that management should by law make available a large amount of information on health and safety to employees, site visitors and the general public. To avoid information overload and confusion, it is recommended that the four R's of rules, regulations, responsibilities and risks make up health and safety information. According to Preece and Stocking (1999), health and safety information contains company's policy, rules, regulations, responsibilities and risks. Safety rules outline the organization's philosophy and commitment to safety and all employees, site visitors and general public should understand that it is high priority issue. Adebiyi, Babalola and Amuda-yusuf (2017) noted that there are many regulations applicable to construction, only required regulations are communicated in a clear, concise and correct manner if health and safety objectives are to be achieved. All employees should be fully aware of their responsibilities and should be provided with all information necessary to carry them out in a safe manner. Management should also provide information, instruction and training so employees can carry out their responsibilities, fully aware of risks to health and safety, measures to prevent them and emergency procedures in event of risks being realized (Preece and Stocking, 1999).

Contents of Health and Safety Information

Okoye *et al.*, (2016) highlighted some of health and safety information as: company's health and safety policy; risk associated with the current job, the potential risks to the health and safety of the workers; location and nature of hazard in the workplace and emergency and first aid procedures. Kayumba, (2013) also identified health and safety information such as: preventive and protective measures for the risks and hazards on site; procedures for the safe operation, use, maintenance and replacement of protective equipment; site rules and best practice in the company. Other health and safety information are injury and incident reporting procedures; accident investigation; procedures for resolving health and safety issues; disciplinary policy; accident statistics; learning from accidents; the identities of those who have a role within the organization's health and safety management system (Adebisi *et al.*, 2017).

Effectiveness of Health and Safety Information

For health and safety information to be effective it has to be understood, which is governed by kind of information to be communicated, the target audience and the strategy used for information transmission. According to Adebisi (2018), during post-project assessments, project team members have always listed provision of health and safety information as one of the integral areas which required improvement. In addition, project team members regarded troubled projects to have run smoother had adequate information on health and safety been provided.

RESEARCH METHODS

The research was conducted within the scope of construction firms that registered with Lagos State Public Procurement Agency (LSPPA), Nigeria. LSPPA maintains the database of registered contractors and described their classifications and categorizations based on contract value. Construction firms under categories D and E were considered because of their involvement in projects with huge contract sums and also have records of health and safety policies. The supervisors and site-operatives working for the identified construction firms on public projects were identified to participate in the study in line with studies carried out by Kolo (2015) and Adebisi (2018).

Pilot survey revealed that there were 55 active construction firms that had on-going projects. The study therefore, adopted purposive sampling technique to select one construction site from the identified firms similar to study carried out by Akunyumu (2016). On each site visited, a supervisor and 3 site-operatives were randomly selected from bricklayers, carpenters, iron benders, electricians, and plumbers working for the identified firms. This resulted into sample of 220. This consists of 55 supervisors and 165 site-operatives. The use of questionnaire was adopted for data collection. The total number of copies of questionnaire retrieved was 161, representing 73.1% response rate consisting of 35 copies from the supervisors and 126 from the site operatives. The high response rate was achieved through the engagement of Research Assistants who were actively involved in the distribution and retrieval of the questionnaire. Information collected involved usage of health and safety information. Mean score (MS), standard deviation (SD) and analysis of variance technique were the analytical tools used.

The questionnaire was divided into two categories. The first category was designed to get information about personal data of the respondents such as education, profession, roles and year of experience in construction industry. The second set of questions was designed with the purpose of establishing usage of health and safety information. Respondents were therefore requested to rate their agreement with each of the 23 variables identified from literature review on a five point Likert scale from 1 = not

ed to 5 = very often used. Respondents were also requested to state and rate other health and safety information not included in the questionnaire that can be used on construction sites in the study area.

RESULTS AND DISCUSSION

Respondents were given ample time to answer the questions to express their professional opinion about usage of health and safety information.

Response Rate

The total number of copies of questionnaire retrieved was 161 representing 73.1% response rate consisting of 22% from the supervisors and 78% from the site operatives as indicated in Table 1.

Table 1: Response rate of questionnaire administered

Respondents	Questionnaire Distributed	Questionnaire Retrieved	Over All Response Rate (%)
Site- Supervisors	55	35 (64%)	22
Site-operatives	165	126 (76%)	78
Total	220	161 (73%)	100

Respondents' Background Information

The reliability of any research is partly dependent on the source of data and the rigorousness of the analysis employed. To provide reliability and impose confidence of the findings, questions posed in the questionnaire were therefore aimed at gathering information about the background of the respondents.

Analysis of Supervisors' Profile

Table 2 revealed the categories of the contracting organizations' registration with Lagos State Government under Lagos State Public Procurement Agency (LSPPA). Majority of the companies registered under category D (60%) while others are in category E (40%). This finding indicated that majority of the contracting organizations surveyed are high caliber, well-structured and also noted for executing projects with huge contract sums. The type of contracting organization gives the reflection on the type of projects they have handled. From Table 2, it is clear that the supervisors surveyed cut across all types of construction and have enormous experience as far as construction projects are concerned. To further provide reliability and credibility to the data collected, Table 2 indicated that majority of the supervisors have obtained at least a first degree. The spread of educational qualification of the supervisors surveyed can be said to be enough to provide the information required from them and that the information provided was borne out of their understanding of the issues studied. The results from Table 2 show that the respondents have experience in construction activities. It can be seen from the demographic variables collected (Table 2) that the respondents have expertise in the construction industry. It is therefore plausible to conclude that the data provided is credible.

Table 2 Site Supervisor's Profile

Profile	Frequency	Percentage (%)	Cumulative
Categories of Company's Registration with Lagos State			
Government			
Category D	21	60.0	60
Category E	14	40.0	100
Total	35		
Type of Contracting Organization			
Building Engineering	15	42.9	42.9
Civil Engineering	13	37.1	80.0
Industrial Engineering	5	14.3	94.3
Service Engineering	2	5.7	100.0
Total	35		
Highest Educational Qualification of Respondents			
Higher National Diploma (HND)	10	28.6	28.6
Bachelor's Degree (BSc./B.Tech)	16	45.7	74.3
Masters Degree (MSc./M.Tech)	9	25.7	100.0
Total	35		
Length of Service with the Company			
0-5 years	8	22.9	22.9
6-10 years	11	31.4	54.3
11-15 years	7	20.0	74.3
16-20 years	6	17.1	91.4
Above 20 years	3	8.5	100
Total	35		
Years of Experience on Construction sites.			
0-5 years	12	34.3	34.3
6-10 years	8	22.9	57.2
11-15 years	8	22.9	80.1
16-20 years	5	14.3	94.4
Above 20 years	2	5.7	100
Total	35		
Number of Projects Undertaken in the last 10 years			
1-5 projects	2	5.7	5.7
6-10 projects	9	25.7	31.4
11-15 projects	9	25.7	57.1
16-20 projects	11	31.4	88.5
Above 20 projects	4	11.4	100
Total	35		

Table 3: Site-operatives' Profile

	Frequency	Percentage (%)	Cum %
Trade of Site-operatives			
er/Plasterer	30	23.8	23.8
er/Joiner	28	22.2	46
	10	7.9	53.9
ian	3	2.4	56.3
r	3	2.4	58.7
	12	9.5	68.2
/decorator	5	3.9	72.1
	12	9.5	81.6
er	11	8.7	90.3
	12	9.5	100
	126		
Employers in Organization			
ontractor	40	31.7	31.7
attractor	80	63.5	95.2
	6	4.8	100
	126		
of Engagement			
ne	26	20.6	20.6
ne	92	73.0	93.6
rary (daily)	8	6.4	100
	126		
t Education Qualification			
CE	15	11.9	11.9
ary education with vocational	17	13.5	25.4
	31	24.6	50.0
lary education	13	10.3	60.3
y education with vocational skills	40	31.7	92
y education	4	3.2	95.2
test	6	4.8	100
	126		
of Experience on Construction sites.			
rs	32	25.4	25.4
ears	47	37.3	62.7
years	27	21.4	84.1
15 years	20	15.9	100
	126		

sis of Site-Operatives' Profile

3 revealed the type of trades of each operative surveyed. The result shows that 24% of the ives were bricklayers/plasterers, 22% carpenters/joiners, 8% roofers, 2% electricians and also umbers. Other operatives were 10% glazers, 4% painters/decorators, 10% welders and 9% ers. Other 10% operatives were none of the trades stated in the questionnaire.

Table 3 presents the type of employers that engage the operatives and the results indicated that majority of the workers (64%) were employed by sub-contractors while 32% were employed by the main contractors. Others (4%) were neither employed by the domestic sub-contractors. The site operatives' modes of engagement are also presented in Table 3. Majority of respondents were employed on full time. These results show that implementation of health and safety standards on construction sites may not be difficult. Table 3 also presents the highest education qualification of the site operatives. This result revealed that the majority of workers have a very low level of education, which can be a challenge to the way they understood health and safety information.

Respondents were asked to indicate their experience on construction sites in Lagos State. The results show that although the majority of workers have little education, their levels of experience on construction sites are commendable as indicated in Table 3.

Analysis of Usage of Health and Safety Information on Construction Sites

From literature, twenty-three (23) health and safety information were identified. Table 4 shows that safety signs and symbols is the most frequently used health and safety information on construction sites from the supervisors' point of view. It was ranked first with a mean of 4.09 and a standard deviation of 0.887. The use of protective equipment, maintenance and replacement was ranked second with mean value of 3.97 and standard deviation of 0.707. Procedures for safe operation on site was ranked third; obtaining the same mean score of 3.97 with the use, maintenance and replacement of protective equipment, but a higher standard deviation of 0.806.

First aid procedure is another important information that was ranked fourth, with a mean score of 3.94 and standard deviation of 0.802. Site-supervisors also ranked preventive and protective measures for the risks and hazards on site as the fifth frequently used strategy with mean score and standard deviation of 3.91 and 0.818 respectively. These were the most significant health and safety information used on construction sites from the site supervisors' point of view. From the site operatives' point of view, first aid procedures is the most frequently used information on health and safety on construction sites. It was ranked first with a mean of 3.89 and a standard deviation of 0.896. Safety signs and symbols was ranked second with a mean value of 3.69 and a standard deviation of 0.834. The use of protective equipment maintenance and replacement was also ranked third; obtaining a mean score of 3.53 with a standard deviation of 0.838. Procedure for safe operation on site was ranked forth, with a mean score of 3.40 and standard deviation of 0.706. Site-operatives also ranked site regulations as the fifth frequently used strategy with mean score and standard deviation of 3.38 and 0.924 respectively.

Health and Safety Information		Mean	Standard Deviation	Rank	Mean	Standard Deviation	Rank	Mean	Standard Deviation	Rank	Mean	Standard Deviation	Rank
First aid procedures		3.94	0.802	4	3.89	0.896	1	3.92		1		.907	
Safety signs and symbols		4.09	0.887	1	3.69	0.834	2	3.89		2		.307	
Use, maintenance and replacement of protective equipment		3.97*	0.707	2	3.53	0.838	3	3.75		3		.899	
Procedures for safe operation on site		3.97*	0.806	3	3.40	0.706	4	3.69		4		.088	
Preventive and protective measures for the risks and hazards on site		3.91*	0.818	5	3.35	0.861	6	3.63		5		.162	
Site regulations		3.86	0.772	7	3.38	0.924	5	3.62		6		.087	
Safety performance		3.91*	0.981	6	3.29	0.916	9	3.60		7		.243	
Site rules		3.83*	0.747	8	3.28	0.882	10	3.56		8		.066	
Knowledge of emergency procedures		3.83*	0.822	9	3.26	0.837	11	3.55		9		.767	
Company's health and safety policy		3.69	0.832	10	3.33	0.736	7	3.51		10		.564	
Company's philosophy		3.66*	0.838	11	3.23	0.939	12	3.45		11		.863	
Best practices in the company		3.54*	0.780	17	3.31	0.853	8	3.43		12		.000**	
Procedures for resolving health and safety issues		3.63*	0.770	13	3.17	0.840	14	3.40		13		.253	
The identities of those who have a role within the organization's health and safety management system		3.57	0.815	16	3.21	0.915	13	3.39		14		.145	
The potential risk to the health and safety of the workers		3.54*	0.817	18	3.16	0.804	15	3.35		15		.547	
Location of hazard		3.66*	0.906	12	2.92	0.850	19	3.29		16		.001**	
Injury and incident reporting procedures		3.63*	0.808	14	2.91	0.867	20	3.27		17		.001**	
Nature of hazard in the workplace		3.49	0.853	19	2.97	0.929	16	3.23		18		.656	
Disciplinary policy		3.60	1.117	15	2.65	0.844	18	3.13		19		.423	
Safety inspection reports		3.31*	0.867	21	2.96	0.785	17	3.14		20		.002**	
Accident investigation		3.37	0.808	20	2.78	0.809	22	3.08		21		.255	
Minutes of safety review meetings		3.31*	0.932	22	2.68	0.789	23	3.00		22		.255	
Accident statistics and records		3.03	1.098	23	2.83	0.830	21	2.93		23		.711	

* Same mean score, standard deviation was used to rank

** T-test is significant at 5%

From the Table 4, the overall means scores indicated first aid procedures was the most frequently used health and safety information on construction sites. It was ranked first with a mean score of 3.92. The use of safety signs and symbols was ranked second with the overall mean score shows 3.89. The use of protective equipment, maintenance and replacement was the third ranked health and safety information with overall mean score of 3.75. The overall fourth ranked health and safety information is procedures for safe operation on site with a mean score of 3.69. All these health and safety information are very important to prevent injuries and ill-health on construction sites.

Nevertheless, supervisors ranked other health and safety information that were also been used on site albeit not frequently. They include: safety performance, site rules and regulations, knowledge of emergency procedure and company's health and safety policy. It can also be seen from Table 4 that site-operatives ranked safety performance, site rules and regulations, knowledge of emergency procedures and company's health and safety policy as information used on site albeit not frequently. The least used information as far as supervisors were concern were: accident statistics and records, minutes of safety review meetings, safety inspection reports, accident investigation and nature of hazard in the workplace. While the least frequently used information from the site-operatives includes; minutes of safety review meetings, accident investigation, accident statistics and records, injury and incident reporting procedures and location of hazard.

An independent sample t-test was conducted to show how the two groups of respondents (supervisors and site-operatives) rated the health and safety information on construction sites. The results in Table 4 show that significant differences exist among the two groups of respondents on only four (4) items out of the twenty-three (23) considered in the study. These include; location of hazard ($p < 0.05$), injury and incident reporting procedures ($p < 0.05$), best practices in the company ($p < 0.05$) and safety inspection reports ($p < 0.05$). What this means in essence is that the respondents (supervisors and site operatives) vary in their opinion with respect to rating of these health and safety information. For example, the opinion of the supervisors on "location of hazard" as health and safety information as shown by mean score in Table 4 is 3.66 compared to 2.92 for site operatives. This suggests that the supervisors moderately adopt the information, while site operatives seldom do. Likewise, injury and incident reporting procedures, best practices in the company and safety inspection reports were moderately adopted. For the rest of the items, no significant differences exist between the supervisors and site operatives, which is an indication that their opinion (rating or mean score) is not at 0.05 level of significance. In other words, the respondents concur in their opinion regarding these health and safety information.

Discussion of Findings

Supervisors ranked safety signs and symbols as the most frequently used health and safety information on construction sites in line with the studies carried out by Kolo (2015) and Phoya, (2012). The two studies confirmed the importance of safety signs and symbols that they deliver important information, warning of hazard to watch out for and requirements to obey. Information on the use of protective equipment, maintenance and replacement was ranked second. According to Kolo (2015), required personal protection equipment must be worn at all times when working on construction sites. The study emphasized on the importance of inspecting person equipment for any breaks, tears and visible signs of stress or damage before use.

Other important information that was ranked high by the supervisors was the procedures for safe operation on site, which was described by Preece and Stocking (1999) as series of important steps that guide workers on tasks to be carried out on sites. First aid procedure and preventive and protective

However, the risks and hazards on site were also ranked high. From the recommendation on the importance by Agwu and Olele (2014), the contracting firms need to make sure there are enough first aid kits and trainers on construction sites. Phoya, (2012) also emphasized the need to have first aid kits on construction sites. Phoya, (2012) further analyzed the preventive and control measures derived from risk assessment.

Furthermore, site-operatives ranked first aid procedures as the most frequently used information on construction sites. Although most frequently used but as against the survey carried out by Muiruri and Mulinge (2014), they established that most construction sites had first aid boxes but were ill equipped with first aid kits and cotton wool. Safety signs and symbols were also ranked very high in line with Muiruri and Mulinge (2014), that safety signs and signals are one of the main means of communicating health and safety information which includes the use of illuminated signs, hand and voice signals like fire alarms. Site operatives also ranked the use of protective equipment, maintenance and replacement, procedure for safe operation on site and site regulations as important health and safety information on sites. These information were also considered important on construction sites by Akunyumu (2016) and Al-Kinani (2011).

A simple t-test was conducted to see how the two groups of respondents (supervisors and site-operatives) rated the use of health and safety information on construction sites. The results showed that significant differences exist on only four (4) items out of the twenty-three (23) items included in the study. The items are: location of hazard, injury and incident reporting procedures, first aid kit in the company and safety inspection reports. This is in line with the study carried out by Akunyumu et al. (2017). In other words, the respondents concur in their opinion regarding the use of health and safety information.

CONCLUSION

From the results of the analysis, the study was able to find out that the most important health and safety information on construction sites is safety signs and symbols. This is because this information is easily understood by everyone on sites. Other information equally important are: the use of protective equipment, its maintenance and replacement; procedures for safe operation on construction sites and site regulation, as well as preventive and protective measures for risks on sites. The study also found out that the supervisors and site operatives agreed on their opinions. No significant difference exists between the ranking of these health and safety information on construction sites. The study is limited to supervisors and site-operatives working for contracting firms registered with Lagos State Public Procurement Agency (LSPPA), Nigeria under contract P&E.

REFERENCES

- Agwu, B. T. (2018) *Assessment of Health and Safety Information Communication on Construction Sites in Lagos State, Nigeria*. Unpublished PhD Thesis, Department of Quantity Surveying, Obafemi Awolowo University Ile-Ife.
- Akunyumu, T., Babalola O. and Amuda-yusuf G. (2017) An assessment of the effectiveness of health and safety communication strategies in the construction industry. *Archisearch Journal* 7 (1), 26-38.
- Akunyumu, T. K. and Okafor C.C. (2013) Occupational health, safety and environment (HSE) trend in Nigeria. *Journal of Environmental Science, Management and Engineering Research*. 2 (1), 24-29.

- Agwu, M. O. and Olele, H. E. (2014). Fatalities in the Nigerian Construction Industry: A case of Poor Safety Culture. *British Journal of Economics: Management and Trade*, 3 (4), 431- 454.
- Ahadzie, D. K. and Amoa-Mensa, K. (2010) Management practices in Ghanaian house building industry. *Journal of Science and Technology* 30 (2), 62-75.
- Akunyum, S. (2016) *A framework for on-site communication planning for construction managers in Ghana*. Unpublished PhD Thesis, Department of Building Technology, Kwame Nkrumah University of Science and Technology, Kumasi.
- Al-Kilani, F. M. (2011) *Improving safety performance in construction project in Libya-Case study in Tripoli city*. Unpublished Master Thesis, Diponegoro University.
- Bandulahewa, B. K. (2015). *Effective project communication for construction project managers in Sri Lanka*. Unpublished PhD Thesis, Department of Civil Engineering, University of Moratuwa, Sri Lanka.
- Garcia , J. C., Arditi, D., and Le, K. T. (2014). Construction Progress Control (CPC) Application for Smartphone. *Journal of Information Technology in Construction (ITcon)*, 19, 92-103.
- Ibem , E. O., Anosike, M. N. and Azuh, D. E. (2011) Challenges in public housing provision in the post-independence era in Nigeria. *International journal of human sciences* 8 (2), 421-443.
- Kayumba A. (2013), Editorial: Construction work and occupational safety and health. *African Newsletter on Occupational Health and Safety*, 23(3), 51.
- Kolo D. N. (2015) *Safety issues involving workers on building construction sites in Nigeria: An Abuja study*. Unpublished Master Thesis, Department of Civil Engineering, Eastern Mediterranean University, Gazimağusa, North Cyprus.
- Kumar S. and Bansal V.K. (2013) Construction safety knowledge for practitioners in the construction industry. *Journal of Frontiers in Construction Engineering*. 2 (2), 34-42.
- Kwofie, E. (2015). *Contribution of Unique Features of Mass Housing Projects to Project Team Communication Performance*. Unpublished PhD Thesis, Kwame Nkrumah University of Science and Technology, Kumasi.
- Landin, E., and Kindahl, N. (2013). *Information and communication trends in the Swedish construction industry*. KTH Architecture and the Built Environment, Department of Real Estate and Construction Management, Stockholm.
- Muiruri G. and Mulinge, C. (2014) Health and safety management on construction projects sites in Kenya: a case study of construction projects in Nairobi country. *International journal of Occupational Safety, Environmental Health* 3(3), 50-61.
- Neale R. (2013), Ten factors to improve occupational safety and health in construction projects. *African Newsletter on Occupational Health and Safety*, 23(3), 52-54.
- Okolie, K. C. and Okoye, P.U. (2014) Appraising the influence of cultural determinants of construction workers safety perception and behaviour in Nigeria. *International Journal of Engineering and Medical Science Research* (1) 11-24.
- Okoye, P. U., Ezeokonkwo J. U. and Ezeokoli F. O. (2016), Building Construction Workers' Health and Safety Knowledge and Compliance on Site. *Journal of Safety Engineering* 5(1): 17-26.
- Phoya, S. (2012). *Health and safety risk management on building construction sites in Tanzania: the practice of risk assessment, communication and control*. Unpublished Master thesis Chalmers University of Technology.
- Preece, C. and Stocking, S. (1999) Safety communication management in construction contracting. *Association of Researchers in Construction Management*, (2) 529-39
- Ulang, N. M. (2012) Communication of construction health and safety information in design. *Journal of Civil and Environmental Research*. 2 (5) 25-33.
- Umeokafor, N. I. Isaac D. Jones K.G. and Umeadi B. (2014) Enforcement of occupational safety and health regulations in Nigeria: An exploration. *European Scientific Journal*, Special Edition, 3, 93-104.
- Vitharana, V.H.P. De Silva G.H.M.J.S. and De Silva S. (2014), Health hazards, risk and safety practices in construction sites – A review study. *Engineer, The Institution of Engineers, Sri Lanka* 28 (3), 35-44.