KNOWLEDGE AND PRACTICE OF OCCUPATIONAL HAZARD CONTROL AMONG BUILDING CONSTRUCTION WORKERS IN LAGOS METROPOLIS, NIGERIA

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ABSTRACT

The study examined the influence of knowledge on health and safety management practices among the building construction workers in Nigeria. The main purpose of the study is to devise appropriate strategies by which the occurrence of preventable adverse events at the construction sites could be reduced to the barest minimum. Data were sourced through structured questionnaires administered on 150 bricklayers and 100 carpenters selected through accidental sampling technique. Participants were asked questions that tested their knowledge on safety management practices. They were also asked to rate their level of practice of hazard control using a 5-point scale. Frequency counts, percentage and mean were used to analyse the data. Pearson Product Moment Correlation(r) test was also conducted on the results to determine the relationship between knowledge and safety management practices. Results showed that 190 had poor knowledge, 49 had fair knowledge and 12 had good knowledge of hazard control. Regarding the level of practice of hazard control by the participants, 192 seldom or never practiced it, 46 fairly practiced while 12 practiced very often. Correlation coefficients indicate strong positive relationship between the two variables (r= 0.84 for bricklayers; 0.98 for carpenters). The study concluded that regular training and workshops that keep workers abreast of new trends and innovations in occupational safety measures and disaster management would make building construction workers to be fully practising hazard control at construction sites.

KEYWORDS: *Building construction workers, Disaster, Knowledge, Occupational hazard, Prevention*.

I. INTRODUCTION

One of the greatest challenges facing humanity in contemporary times is the various forms of disaster ranging from weather-related to work-related catastrophes. Occupational accident, in particular, has been reported to be one of the major public health problems worldwide [1]. This is very rampant in the construction industry accounting for a significant part of all reported cases of occupational injuries [2,3,4]. The industry has been described as a dynamic, high-pressured and potentially high-risk environment that is laden with various forms of hazards [5,6,7]. The degree of risk is directly related to a number of factors including the inherent nature of construction work, routine use of various types of delicate equipment and working in an extreme weather condition. Over-exertion and working overtime may as well elevate the odds of having occupational injuries. Confined space, job stress, under-staffing, extended working hours, distractions and ambient noise may increase the risk of occupational accidents. Although, safety risks on construction site are unavoidable, these can be prevented if workers are instructed on how to identify the hazards that might be present at the work site [8]. The above assertion has, over the years, led to the development of standards, guidelines and work practice controls by many labour organisations such as International Labour Organisation (ILO) and government agencies for the worker's benefit [9]. However, despite the existence of all these standards and recommended safety practices/procedures, occurrence of preventable adverse events in the construction sites still persist all over the world [2,10].

According to ILO [2], more than 337 million accidents happen on the job every year worldwide, with more than half of these occurring in developing countries. In Nigeria, one out of every ten workers is accidentally injured annually. Although, many workplace accidents have relatively minor repercussions which could result in cut or scratch, others can have more serious and potentially fatal consequences. For example, it was reported that more than 50 million accidents result in occupational diseases and about 2.3 million deaths annually. This is said to be highest in the construction industry where there are about 80 accidents per million hours [2,11,12]. The socioeconomic impacts and human costs of these incidences are tremendous. The victims suffer permanent disability; workers' productivity becomes low and companies record losses due to time loss and payment of compensation/claims and burial expenses. And because of the ripple effects of construction industry on other sectors, the gross domestic product of the countries is reduced [13,14,15,16].

While a lot of research efforts have been directed towards examining the factors responsible for this situation, it appears that the main concern has been centred on general and broad spectrum of construction workers and general safety practice only. Little or nothing is known about the practice of hazard prevention among the bricklayers and carpenters in the informal sector, especially in sub-Sahara African countries. Whereas this set of construction workers, apart from constituting more than70% of workforce in the building industry and being deeply involved more than any other category of workers, are exposed to hazards, which to a large extent, are different from other construction workers [17]. The need to examine the knowledge and practice of hazard control by these groups of workers is, therefore, a fundamental one. It was against this background the present study was conceived.

II. MATERIALS AND METHODS

The Study Area

The study was carried out within the ten fast developing areas of Lagos Metropolis (Lekki Urban, Ajah, Surulere, Eko Atlantic, Banana Island, Gbagada, Magodo, Parkview Estate, and Ikeja) where construction activities are concentrated [18,19]. Lagos is a coastal city in Nigeria situated within latitudes $6^0$23'N and $6^0$41'N and longitudes $2^0$42'E and $3^0$42'E. It is bounded to the south by Atlantic Ocean, and to the west by Agbara and Ijanikin settlements. Lekki rural settlement forms the eastern boundary while the northern boundary is made up of the landmass of Ikorodu and Alagbado towards Abeokuta. The Metropolis is the largest city in Nigeria and African Continent and one of the fastest growing cities in the world. Its growth has been phenomenal both demographically and spatially [20]. It covers an area extent of 1,171.28 sq. km with a population of 8,048,430 as at 2006 [21,22]. Estimates by the United Nations and the Lagos State Regional Master Plan puts the area's current population at about 16 million inhabitants [22,23]. Because of its status as the commercial nerve centre of Nigeria and the most populous city in sub-Sahara Africa, the metropolis is characterised by high concentration of construction activities.

Study Design and Instruments

The study adopted a cross-sectional, descriptive approach to assess the relationship between extent of practice (dependent variable) and knowledge of construction workers on occupational hazard control (independent variable). The data for the study were collected by the use of two sets of structured questionnaire (one for the bricklayers and the other for the carpenters). Each set of questionnaires was divided into three sections. The first section was designed to collect general information about the respondents. The second section consists of ten dichotomous items testing the procedural and the impact knowledge of the workers about hazard prevention at the construction sites. Each correct answer was scored '1' and incorrect answer was scored '0'. Total scores for each respondent were obtained by adding their scores on the ten items. Scores that fell within the interval of 0-4 were adjudged to be poor. Scores within the interval of 5-6 were considered to express fair knowledge while scores that range from 7 to 8 and those within the interval of 9-10 were adjudged to be expressing good and excellent knowledge respectively.

The third part contains an evaluation checklist that elicits how often the respondents perform safety practices. The checklist was rated by the respondents on a five-point scale (from 0 to 4), using '0' for Never, '1' for Seldom, '2' for Quite often, '3' for Very often and '4' for Always. The total scores for each respondent were obtained by summing up the scores on the twenty items. Scores that are within the range of 72 – 80 were considered 'Very High', those within 56 -71 were considered 'High', 40 - 55 were regarded as 'Average' and scores within 0 - 39 were considered 'Low.'

Validity and Reliability of the Instruments

The instruments were pretested on 50 bricklayers and 25 carpenters at Ikoyi area. Most of the items in the questionnaires were found to be well understood and easy to fill. The few ambiguities noticed were rectified and confusing statements were recast with the guidance of six experts who also ascertained the face and content validity of the instruments. The knowledge and practice scales were later analysed using Kuder-Richardson and Cronbach's alpha reliability coefficients respectively. The coefficients were 0.71 and 0.80 for knowledge and practice for bricklayers respectively; while the coefficients were 0.70 and 0.82 for knowledge and practice for carpenters respectively. Magnusson [24] and Nichols [25] consider these values to be adequate.

Procedure

The first set was administered on 150 bricklayers and the other on 100 carpenters, all selected through accidental sampling technique because data on the two sets of population were not available. Visits were paid to construction sites in the ten randomly selected fast developing areas in Lagos between Mondays and Saturdays for four weeks. Each respondent, assisted by the investigators completed the questionnaire on the spot within 20 minutes and have it collected. Respondents were made to know that they were participating voluntarily and, thus, the questionnaires were administered on only the respondents that showed interest. Confidentiality and anonymity of respondents were maintained by utilizing codes instead of names on the questionnaires.

Methods of Analysis

Both descriptive and inferential statistical methods were used to analyse the data. The descriptive statistics were used mainly for the description of population characteristics and analysis of Likert response through the use of frequencies, mean, weighted mean and percentages. Pearson Product Moment Correlation was used to test the relationship between the level of knowledge and practice of occupational hazard control, using the following commonly used interpretations:

±0.8 – ±1.0:	Highly dependable relationship
±0.6 – ±0.79:	Moderate relationship
±0.4 – ±0.59:	Fair relationship
±0.2 – ±0.39:	Slight relationship
±0.0 – ±0.19:	Negligible relationship [26].

The correlation coefficient(r) obtained was further subjected to student t-test to determine whether it was indicative of the real relationship between the variables or it could be attributed to chance.

III. THEORETICAL FRAMEWORK

The issues of health and safety promotion, well-being and behaviour are complex, abstract concepts which are oftentimes very difficult to comprehend. These have engaged the attention of scholars who use theoretical models to articulate these variables and facilitate the understanding of the concepts and the relationship between them. One of such models and, perhaps, the one that is most relevant to this study is Knowledge-Deficit Model of Behaviour Change. The term "deficit – model" was first used in the 1980s by the scientists studying the public communication of science to explain the negative attitude of people towards the benefits of scientific and technological innovations [27]. The model holds that public uncertainty and scepticism towards modern science is caused primarily by lack of sufficient knowledge about science and other related issues. It posits that if adequate information is provided to overcome this lack of knowledge, the general public opinion will change.

The model has since then been explored to explain other behaviours such as pro-environmental behaviour, health issues and public acceptance of new technological inventions and government policies. It was assumed that there would be more significant change in people's behaviour if they know about the impact of an action or about the details of how to engage in such behaviour. Information is thus seen by the model as a key mechanism for generating knowledge which, in turn, shapes attitude that leads to positive behaviour.

Although the model has been criticized by some authors for eliciting modest and short-lived behavioural change [28,29,30], a sizeable number of studies on a variety of behaviours such as condom use, cigarette smoking and energy conservation have consistently found knowledge to be a strong correlate [31,32]. Schultz [33] even contends that information would lead to a significant change in behaviour especially in situations where lack of knowledge is a barrier to action. He explains that in such situations, people do not know the impact of behaviour or the procedure for performing the action. He then concludes that a well-designed campaign strategy that incorporates both impact and procedural knowledge would change beliefs and increase knowledge which would consequently lead to behavioural change. This holds true particularly for an act or policy that has direct impact on people [28].

The present study sees safety management practice as an issue that has direct bearing on the health and welfare of construction workers. It is thus hypothesized that low level of practice of hazard control among construction workers in Nigeria could be as a result of their insufficient knowledge about job hazards and their control. The paper believes that construction workers would engage in health and safety practices if they know the risks associated with their work and the safety measures needed to avert the consequences.

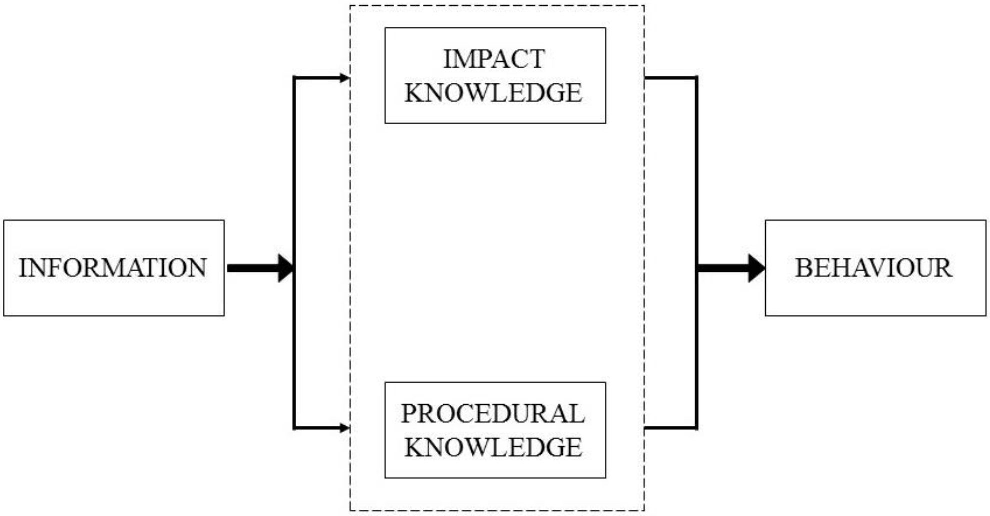

Figure 1: Information/Knowledge- Deficit Model

IV. RESULTS

Demographic Characteristics of the Respondents

Table 1 displays individual characteristics of the respondents. Majority of the respondents are within the age bracket of 41 – 50 and 31 – 40 with the respective mean age of 38 years (SD =11). Fewer bricklayers and carpenters are within the age of 11 – 20 and 51 – 60. Quite a number of the respondents had secondary education (56% Bricklayers, 30% Carpenters). Virtually all the workers, however, had no training qualification. Just 8% and 6% of them had Trade Test and Full Technical Certificate respectively.

Table 1: Demographic Characteristics of the Respondents

S/N	Demographic Variables	Characteristics	Bricklayers		Carpenter	
			Number	Percentage (%)	Number	Percentage (%)
1.	Age	11 – 20	15	10	8	8
		21 – 30	28	19	20	20
		31 – 40	26	17	20	20
		41 – 50	69	46	42	42
		51 – 60	12	8	10	10
2.		Informal	17	11	12	12

	Educational Qualification	Primary	50	33	58	58
		Secondary	84	56	30	30
		Tertiary	-	-	-	-
3.	Training Qualification	None	133	89	81	81
		Trade Test	14	9	10	10
		Full Technical Certificate	3	2	9	9

Source: Authors' Analysis (2014)

Respondents' Knowledge Status on Occupational Hazard Control

Overall, majority of the respondents (77%) have poor knowledge of safety practices. Only 4% have good knowledge of hazard control at the construction site. There is no difference in the level of knowledge among both categories of workers. Item-by-item analysis of the workers' knowledge about the subject indicates that 2 out of 10 items were answered correctly by more than 50% of the bricklayer respondents. The same is true of the carpenters. The vast majority of the bricklayers did not know that a single ladder must not be more than 6.1 metres high (89%) while ninety-eight per cent (98%) of the carpenter respondents did not know either that certain wood dusts are carcinogenic (Tables 2, 3 and 4).

Table 2: Respondents' Knowledge Status on Occupational Hazard Control

S/N	Knowledge Status	Bricklayers (N=150)		Carpenters (N=100)		Total	
		Frequency	%	Frequency	%	Frequency	%
1.	Excellent	-	-	-	-	-	-
2.	Good	9	6.0	2	2.0	11	4.4
3.	Fair	35	23.3	14	14.0	49	19.6
4.	Poor	106	70.7	84	84.0	190	76.0
Total		**150**	**100**	**100**	**100**	**250**	**100**

Source: Authors' Analysis (2014)

Table 3: Item-by-Item Analysis of Bricklayers' Knowledge on Occupational Hazard Control

S/N	Questions	Responses (N=150)			
		YES		NO	
		Freq.	%	Freq.	%
1.	Skin contact with cement may cause dermatitis.	105	70	45	30
2.	It is essential that one wears goggles while on ground supplying materials to the man working above.	31	21	119	79
3.	It is the responsibility of the principal contractor to provide adequate space for storing materials, safe systems for collecting and disposing of excess or waste materials.	86	54	64	46
4.	A ladder must be placed at an angle between 70^0 and 80^0.	36	24	114	76
5.	A single ladder must not be more than 6.1 metres high.	20	13	130	87
6.	A trestle ladder must have edge protection along the outer length of the platform.	38	25	112	75
7.	The most common method of providing safety for work in excavations is to support both sides of the trench through shoring	72	48	78	52
8.	The outer edge and the ends of a working platform should be protected by a rigid guard rail.	39	26	111	74
9.	A toe-board rising at least 150 mm above the platform which is provided at its outer edge prevents from falling off the platform.	30	20	120	80
10.	Awkward postures can lead to musculoskeletal disorder.	46	31	104	69

Source: Authors' Analysis (2014)

Table 4: Item-by-Item Analysis of Carpenters' Knowledge on Occupational Hazard Control

S/N	Questions	Responses (N=100)			
		YES		NO	
		Freq.	%	Freq.	%
1.	Pneumatic hammer generates more noise than impact hammers.	13	13	87	87
2.	Some wood dusts are carcinogenic.	2	2	98	98

3.	Sawing, sanding and drilling generate harmful dusts.	21	21	79	79
4.	It is essential that one wears goggles while on ground supplying materials to the man working above.	26	26	74	74
5.	The contractor/client must provide adequate space for storing materials, safe systems for collecting and disposing of excess or waste materials.	54	54	46	46
6.	A ladder must be placed at an angle between 70^0 and 80^0.	29	29	71	71
7.	A single ladder must not be more than 6.1 metres high.	13	13	87	87
8.	A trestle ladder must have edge protection along the outer length of the platform.	28	28	72	72
9	The outer edge and the ends of a working platform should be protected by a rigid guard rail.	23	23	77	77
10.	A toe-board rising at least 150 mm above the platform must always be provided at its outer edge.	26	26	74	74

Source: Authors' Analysis (2014)

Practice of Occupational Hazard Control by Construction Workers

Majority of construction workers (77%) do not observe the rules and precautions that prevent occupational accident or injury at construction sites (Table 5). For example, majority of bricklayers (65%) and carpenters (70%) do not wear mask and foot protection while working on site (Tables 6 and 7).

Table 5: Practice of Occupational Hazard Control by Construction Workers

S/N	Level of Practice	Bricklayers (N=150)		Carpenters (N=100)		Total	
		Frequency	**%**	**Frequency**	**%**	**Frequency**	**%**
1.	Very High	-	-	-	-	-	-
2.	High	9	6	3	3	12	4.8
3.	Average	36	24	10	10	46	18.4
4.	Low	105	70	87	87	192	76.8
Total		**150**	**100**	**100**	**100**	**250**	**100**

Source: Authors' Analysis (2014)

Table 6: Extent of Practice of Hazard Control by Bricklayers at the Construction Site

S/N	Safety procedures/universal precautions	Frequency of practice					Mean Score
		Always	**Very often**	**Quite often**	**Seldom**	**Never**	
1.	Wears mask while mixing or demolishing.	0 (0)	0 (0)	10 (7)	39 (28)	97 (65)	**0.39**
2.	Wears foot protection.	0 (0)	0 (0)	2 (1)	52 (35)	96 (64)	**0.37**
3.	Washes hand with soap before eating in the work zone.	0 (0)	1 (0.4)	4 (2.6)	57 (38)	88 (59)	**0.45**
4.	Wears hard hat.	0 (0)	0 (0)	0 (0)	6 (4)	144 (96)	**0.04**
5	Wears full-body protective gear.	0 (0)	0 (0)	6 (4)	37 (25)	107 (71)	**0.32**
6.	Makes use of changing facilities after the day's work.	74 (49)	23 (15)	37 (25)	5 (3.6)	1 (0.4)	**2.96**
7.	Wears goggles while standing to inspect work on site.	0 (0)	0 (0)	0 (0)	42 (28)	108 (72)	**0.28**
8	Have two or three breaks before the close of work.	3 (2)	6 (4)	11 (7)	29 (19)	101 (67)	**0.54**
9.	Uses wheelbarrow for transporting concrete/mortar.	23 (15)	0 (0)	46 (31)	10 (7)	71 (47)	**1.29**
10.	Survey site conditions before work is commenced.	8 (5)	11 (7)	79 (53)	52 (35)	0 (0)	**1.17**
11.	Wets the structure to be demolished before work is commenced.	7 (5)	9 (6)	5 (3)	69 (46)	60 (40)	**0.89**

12.	Refuses to do a job you believe it exposes you to danger.	35 (23)	9 (6)	41 (27)	29 (19)	36 (24)	**2.85**
13.	Ensures that barricade or hoarding is erected around the excavation.	12 (8)	26 (17)	30 (20)	47 (31)	35 (23)	**1.24**
14.	Uses a fall-arrest harness system while using ladder.	0 (0)	0 (0)	0 (0)	14 (9)	136 (91)	**0.01**
15.	Uses a ladder having a loading rating that is not less than 120 kg.	0 (0)	0 (0)	12 (8)	17 (11)	121 (81)	**1.27**
17.	Braces ladder to the ground.	25 (17)	19 (13)	31 (20)	39 (26)	36 (24)	**1.72**
18.	Uses 800 mm wide working platform that has a guard rail at its outer edge and ends.	0 (0)	0 (0)	11 (7)	19 (13)	120 (80)	**1.27**
19.	Uses shoring to support both sides of trench.	1 (0.7)	17 (11.3)	46 (31)	40 (27)	46 (31)	**2.87**
20.	Performs regular body checking	12 (8)	19 (13)	26 (17)	45 (30)	48 (32)	**1.35**

Note: Figures in parentheses are row percentages.
Source: Authors' Analysis (2014)

Table 7: Extent of Practice of Hazard Control by Carpenters at the Construction Site

S/N	Safety procedures/universal precautions	Frequency of practice					Mean Score
		Always	Very often	Quite often	Seldom	Never	
1.	Wears mask while sawing or drilling.	1 (1)	7 (7)	10 (10)	12 (12)	70 (70)	**0.57**
2.	Wears foot protection.	0 (0)	0 (0)	0 (0)	18 (18)	92 (92)	**0.18**
3.	Washes hand with soap before eating in the work zone.	1 (1)	4 (4)	7 (7)	43 (43)	65 (65)	**0.73**
4.	Wears hard hat.	15 (15)	14 (14)	11 (11)	28 (28)	34 (34)	**1.52**
5	Wears full-body protective gear.	0 (0)	0 (0)	3 (3)	6 (6)	91 (91)	**0.12**
6.	Makes use of changing facilities after the day's work.	42 (42)	25 (25)	28 (28)	4 (4)	1 (1)	**3.03**
7.	Wears goggles while standing to inspect work on site.	6 (6)	16 (16)	17 (17)	18 (18)	43 (43)	**1.24**
8.	Uses impact hammers.	61 (61)	18 (18)	11 (11)	8 (8)	2 (2)	**3.28**
9	Have two or three breaks before the close of work.	3 (3)	6 (6)	14 (14)	33 (33)	44 (44)	**0.91**
10.	Survey site conditions before work is commenced.	8 (8)	13 (13)	63 (63)	16 (16)	0 (0)	**2.13**
11.	Refuses to do a job you believe it exposes you to danger.	11 (11)	25 (25)	51 (51)	9 (9)	4 (4)	**2.33**
12.	Uses a fall-arrest harness system while using ladder.	0 (0)	0 (0)	0 (0)	12 (12)	88 (88)	**0.12**
13.	Uses a ladder having a loading rating that is not less than 120 kg.	1 (1)	0 (0)	8 (8)	12 (12)	79 (79)	**0.32**
14.	Braces ladder to the ground.	53 (53)	13 (13)	22 (22)	7 (7)	5 (5)	**3.02**
15.	Uses 800 mm wide working platform that has a guard rail at its outer edge and ends.	0 (0)	0 (0)	9 (9)	22 (22)	69 (69)	**0.40**
16.	Places ladder at an angle between 70^0 and 80^0.	14 (14)	13 (13)	3 (3)	28 (28)	42 (42)	**1.29**
17.	Performs regular body checking.	8 (8)	11 (11)	25 (25)	20 (20)	36 (36)	**1.35**
18.	Uses respirator.	0	0	3	1	96	**0.07**

		(0)	(0)	(3)	(1)	(96)	
19.	Reports accident to the supervisor	33 (33)	15 (15)	13 (13)	18 (18)	21 (21)	**2.21**
20	Uses ear plugs.	0 (0)	0 (0)	13 (13)	23 (23)	64 (64)	**0.49**

Note: Figures in parentheses are row percentages.
Source: Authors' Analysis (2014)

Relationship between Knowledge and Practice of Occupational Hazard Control by the Construction Workers

The computed r-value for the relationship between knowledge and extent of practice among the bricklayers was 0.84 with computed t-value of 18.8 which is greater than the critical value of 1.960 at a significance level of 0.05. This indicates that there is a strong and significant positive relationship between knowledge and practice of hazard control among bricklayers (Table 8). Similarly, the calculated r-value for the relationship between knowledge and extent of practice among the carpenters was 0.98 with a computed t-value of 48.8 which is greater than the critical value of 1.980 (Table 8), indicating that there is a strong and significant positive relationship between the knowledge and practice of hazard control among the carpenters.

Table 8: Pearson Product Moment Correlation/Student t-test Table Testing the Relationship between Knowledge and Practice of Occupational Hazard Control by the Construction Workers

Workers' Categories	**Variables**	**Mean**	**Standard Variation**	**R**	**R^2**	**Df**	**P**	**t-cal.**	**t-critical**
Bricklayers	Knowledge	2.26	0.345	0.84	0.71	148	0.05	18.8	1.960
	Practice	28.07	5.42						
Carpenters	Knowledge	2.60	0.327	0.98	0.96	98	0.05	48.8	1.998
	Practice	30.00	6.02						

Source: Authors' Analysis (2014)

V. DISCUSSION

The low level of knowledge on site hazards exhibited by the respondents indicates that little or no effort had been made by the institutions to educate this category of workers or the campaign effort has not been given wide publicity. As demonstrated by the study, virtually none of them had training qualification. They could have been taught hazards associated with their job and various ways by which these can be prevented if they had undergone specialized training. This lack of knowledge could result in poor safety habits. The findings of the present study corroborate this. Out of 150 bricklayers, only 3 use wheel barrow always to transport concrete or mortar. A large number of them (71%) do not wear full-body protective gear. Barely none of them could be said to be using fall-arrest harness system while working at a height of 4 feet and above. Also, only a non-significant number of carpenters observe this practice, while just 6 out of 250 workers observe two or three breaks before the close of work. This poor safety habit could make the workers more vulnerable to diseases and injuries, even death [5,6,7].

Pearson Product Moment Correlation test establishes strong relationship between knowledge and practice of hazard control among the two categories of workers as it has been previously reported by Rahman, et al [9], Tam & Fung [34], Arslan & Kivrak [15] and Sokas, et al [35]. Those studies discovered that good knowledge of occupational risk reduces the risk of occupational exposure. Similar studies conducted in Egypt and Turkey revealed a positive association between knowledge. Sokas, et al [35] used this model in a study conducted in the U.S. to predict the effect of knowledge on behavioural change. They found that good knowledge of occupational risk reduces the risk of occupational exposure. Educational talks and establishment of more training camps to increase workers' awareness of protective measures were also realised in Hong Kong, China and Iran as a solution to preventing occupational risk [36,37,38].

VI. CONCLUSION

The paper has examined the knowledge and safety practices of workers in the informal sector of Nigerian building construction industry. It found out that bricklayers and carpenters in the study area have poor safety habits and little knowledge about hazard control practices. The study provides quantitative evidence of an association between knowledge and practice of hazard control among construction workers in the area. Efforts at preventing occupational injuries and diseases among these categories of workers in Nigeria should therefore include education and training for both master craftsmen and apprentices. This should consist of teaching general principles of safety and health and the procedures to follow in the event of an accident and injury.

Training should also include instruction about dangerous substances relating to each task and trade. Their awareness of this will make them to stick to safety practices. Workers should also be made to know the responsibilities of the building owner/ principal contractor in the provision of safety environment and their right to refuse to do any job that seems to expose them to danger. Interestingly, majority of these categories of workers had acquired basic education and matured enough to understand safety and health principles (Table 1).

Equally important is the need to emphasise these safety and health principles in the technical colleges and centres for entrepreneurial development and vocational studies in the tertiary institutions where building trades or skills are being taught. This will make the students to inculcate safety habits right from their school days. Instilling safe behaviour in apprentices can be made easier if government can regulate apprenticeship system in the country as it is being done in the developed countries. Like their counterparts in the formal sector, they, too, would imbibe the same culture right from their training days.

Although, the study gave useful insight into the factors responsible for the poor safety management practices exhibited by the building construction workers in the study area, the strength of some of the statistical tools used seems to be compromised due to non-probabilistic sampling method used in collecting the data. Further study using a more probabilistic sampling technique and a large number of subjects are required for a more complete description of the knowledge and practices of hazard control by building construction workers in Nigerian cities. This information can be used to formulate strategies for overcoming the poor safety practices which would subsequently help in combating occupational disaster.

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