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Moda, Haruna and Zailani, Bello Mahmud and Abubakar, Mu'awiya and Ibrahim, Yahaya Makarfi (2022) Management support as a Critical Success Factor (CSF) for changing worker's safety behaviour: a case of the Nigerian construction industry. *The International Journal of Construction Management*. ISSN 1562-3599

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Publisher: Taylor & Francis

DOI: <https://doi.org/10.1080/15623599.2022.2077084>

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To cite this article: Haruna Musa Moda, Nwachukwu Ofodile, Bello Mahmud Zailani, Mu'awiya Abubakar & Yahaya Makarfi Ibrahim (2022): Management support as a critical success factor (CSF) for changing worker's safety attitude: a case of the Nigerian construction industry, International Journal of Construction Management, DOI: [10.1080/15623599.2022.2077084](https://doi.org/10.1080/15623599.2022.2077084)

To link to this article: <https://doi.org/10.1080/15623599.2022.2077084>



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Management support as a critical success factor (CSF) for changing worker's safety attitude: a case of the Nigerian construction industry

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ABSTRACT

Construction workers are often plagued with health and safety challenges on the job site especially in developing countries, largely owing to several factors that encourage poor safety practices on site. This study appraised workers' perception of management engagement as a critical success factor (CSF) for the improvement of Nigerian construction employee's safety attitude, using Nordic Occupational Safety Climate Questionnaire (NOSACQ-50). Findings from the study reveal that small scale and medium scale organizations dominate the industry in Nigeria, and a sizable number (20.4%) of the study participants are between 18 and 27 years of age with majority (74.7%) having work experience of 1–10 years. Management safety priority, commitment and competence and management safety empowerment were found to have strong positive correlation. In addition, the study revealed the existence of safety commitment disparity between clients of publicly and privately owned construction projects across the industry. To advance positive safety attitude across the construction industry in Nigeria, management commitment should be prioritised, while further study on workplace safety measures and workers' safety engagement should be considered.

KEYWORDS

Health and safety; safety attitude; construction management; accident; safety communication; developing countries; Nigeria

Introduction

Safety and health of workers have long been a global concern. The International Labour Organization Convention has placed emphasis on the need to protect employees from occupational injuries and fatalities, which often manifest into negative impact on productivity, economic and social development of a nation (ILO 2006). Furthermore, the United Nation Sustainable Development Goals (SDG 3&8) advocate for organizations to demonstrate value around decent work and the promotion of workplace safety and welfare of workers across industries. At the continent level, the strategic framework for attaining an inclusive and sustainable economic growth and development in Africa, 'Agenda 2063 – The African we want', listed key priority areas that include decent work as part of goal 1 for the continent's 50 years development trajectory (Ndizera and Muzee 2018; Nwozor et al. 2021). While significant effort has been made at improving global workplace health and safety through active research and safety policies, safety challenges related to work are still widespread, especially among workers engaged in hazardous industries such as construction, mining and agriculture (Wu et al. 2018; Afolabi et al. 2021; Zailani et al. 2021). The case is considered worst in developing industries, with almost complete lack of compliance to safety laws and regulations, largely due to nonchalant attitude and poor safety culture across organizations (Abubakar et al. 2021; Osei-Asibey et al. 2021).

Nonetheless, there has been a paradigm shift regarding improving safety in the global construction industry with a drive

towards 'Zero Injury' objective, which emphasizes absolute prevention of workplace accidents and injuries (Hinze and Wilson 2000). A precondition for such shift, however, is a change in safety attitude of both managers and employees, to consider safety as an essential component of daily work routine, rather than as an adjunct (Ismail et al. 2012). Previous studies have acknowledged unsafe human attitude and behaviour as the most common cause of workplace accident and injury among employees (Edwards and Nicholas 2002; Zhang and Fang 2013). Ismail et al. (2012) viewed safety problems at work as a direct reflection of unsafe or careless act exhibited by employees, and the lack of management's commitment towards ensuring employee's safety. Similarly, Fernandez-Muniz et al. (2014), emphasized employees' behaviour as panacea in the improvement of safety performances. Relatedly, Hamid et al. (2008) reported that sources of workplace accidents are largely due to the lack of attention to safety rules, failure to adhere to established job procedures, poor safety attitude and behaviour especially during works that require maximum concentration by employees.

Although Antonsen (2009) observed that creating a safe workplace and strengthening the safety culture in an organization has potential for influencing the overall safety of employees, Edwards et al. (2013) opined that, the exact nature of safe and unsafe attitude and behaviour might differ between organizations due to varying levels of management involvement. This underscores the need to focus more on changing workplace safety culture where management will play an active role especially in industries with

poor safety performance (Okolie and Okoye 2012). It suffices to add that, employees' behaviour towards safety correlates with their ability and or intent to adhere to established safety rules, just as behaviour turns systems and procedures into reality (Fleming and Lardner 2002; Uryan 2010). On this note, it is not sufficient to address cultural issues as they relate to employee's engagement with laid down safety rules alone as opined by Edwards et al. (2013), but rather, a holistic view of cultural, structural and interactional aspects of the organization which promises improved safety compliance. Hinging on the apparent importance of employee's positive safety attitude at work, this study provides a holistic perspective to management's involvement in safety, and its resulting influence on overall level of worker's safety compliance in the industry.

Safety performance of the construction industry in Nigeria

The construction industry in Nigeria has been largely dominated by indigenous small scale and medium-sized organizations, with few large-scale firms mostly owned by expatriates (Odediran et al. 2012). Overall, the industry contributes to the country's economy, providing both direct and indirect employment to over 10 million individuals, thereby amounting to around 3.8% of its gross domestic product (GDP) (Abubakar et al. 2018; Okoye et al. 2018). However, despite such significant economic contribution, the industry suffers from poor implementation of health and safety regulations which has resulted in devastating consequences (Adeyemo and Smallwood 2017; Tunji-Olayeni et al. 2018).

While there are no accurate accident records in the nation's construction industry, García et al. (2021) reported an average of 2500 accidents occurring for every 100,000 people employed in the construction industry around the globe. This is seen to be a result of the dynamic tasks and activities carried out within the industry where accidents are likely to occur, and the negligence of construction organizations in establishing robust management systems capable of enhancing safety standards on sites. Nonetheless, numerous accounts of safety and health issues have been recorded amongst workers in Nigeria. These include musculoskeletal disorder (MSD), fractures, dermatitis, hearing impairment, hand arm vibration syndrome, respiratory diseases and allergic reactions (Tunji-Olayeni et al. 2018; Ngwama 2016; Orelaja et al. 2019; Moda et al. 2019; Ojoawo et al. 2021; Afolabi et al. 2021). Such record depicts inadequate safety management in the risk-prone work environment, on the premise of training and enforcement of safety standards.

Evidently, The Factories Act (2004) in Nigeria and related legislation empowers federal and state agencies to enforce workplace health and safety across industries. However, executing such mandate is far from meeting the set goal. The Nigerian construction industry is plagued with high degree of noncompliance to health and safety regulations. This is partly due to poor enforcement by regulatory agencies at local, state and federal government levels and partly due to lack of management commitment to drive through the required policies at organizational level. Studies have identified the general lack of safety awareness across the industry (Idoro 2008; Afolabi et al. 2021), belief and fate where accident is seen as an 'act of God' (Idubor and Oisamoje 2013), poor knowledge of workplace hazards (Diugwu et al. 2012) and national culture (Okolie and Okoye 2012) as key attributes hindering the maturity of safety compliance within the nation's construction industry.

Although Umeokafor (2017) observed that most of Nigerian laws and regulations originate from the United Kingdom (UK), it could be seen that the trends of legislations in the UK have resulted in an improved safety performance. While Warburton (2001) reported that construction-related accidents represented 91% of employee accidents in the UK as at 1993/1994, with 5.7 deaths per 100,000 employee accidents. It has been observed that the number has continued to decline overtime, with the industry in the UK recording the lowest rate of major and terminal injuries when compared to other similar industries around the globe (Alasamri et al. 2012). The Health and Safety at Work Act, etc., 1974 and other related legislations are augmented with the HSE (2015) regulations, collectively representing a positive change to the persistent safety crisis in the country (HSE 2015). Key elements to the regulations include application of risk management and principles of prevention; selection of competent designers; ensuring availability of appropriate health and safety information, instruction, supervision and training, effective communication and cooperation among all duty holders is maintained (Ibrahim et al. 2022). These, alongside the realignment related to existing priorities that influence safety performance positively within the UK construction industry, are seen as drivers towards enhancement of the industry safety performance (Khalid et al. 2021).

Based on the forgone, it can be asserted that the fundamental problem with workplace safety in Nigeria is not due to limited constituted legislation and regulations, but rather a lack of adequate implementation of legislations, and widespread non-compliance to regulations. Onubi et al. (2021) observed that despite the recent trends in the constitution of safety laws and regulations in Nigeria, the implementation/enforcement of these laws and regulations are still at an infancy stage across the economic sectors of the country. In this regard, it can be contended that failure on the side of the management towards improving safety contributes majorly to noncompliance to safety regulations in construction organizations as earlier argued by Ngwama (2016).

The study rationale

Although persistent accidents related to work within the construction industry surpass those of other industries globally, construction-related accidents are often seen to be much higher in less developed economies like Nigeria (Idoro 2008; Belel and Mahmud 2012). The Nigerian context has been poor because of several factors. These include inadequate legislation, non-compliance to safety regulations, poor employee safety behaviour, fatigue, site environmental conditions, ineffective management safety commitment, etc. These were motivated by the self-regulated nature of the construction environment (Diugwu et al. 2012; Umeokafor 2017). In addition, owing to the lack of adequate structure to enforce the existing statutory regulations in the country, the image of the construction industry and its operational capability both at local and international levels is seen as ineffective, as such the safety and health of employees will continue to be compromised. Therefore, the significance of creating a safe workplace and adopting conscious efforts aimed at strengthening the safety attitude of workers that are consistently exposed to safety hazards within the nation's risk-prone construction industry cannot be overemphasized. Hence, this study aims to ascertain the critical role of management support in changing workers' safety attitude in Nigeria's construction industry.

Table 1. Cronbach's alpha reliability.

Scale	Items	Mean	SD	Cronbach's α
1. 'Management safety priority, commitment, and competence'	9	26.5937	4.79815	0.859
2. 'Management safety empowerment'	7	20.1037	3.29751	0.781
3. 'Management safety Justice'	6	17.2680	2.72225	0.829
4. 'Worker's safety commitment'	6	18.3401	2.98061	0.831
5. 'Worker's safety priority and risk non-acceptance'	7	18.2911	2.70495	0.742
6. 'Safety communication, learning, and trust in co-worker's safety competence'	8	24.3199	3.41177	0.773
7. 'Trust in the efficacy of safety systems'	7	18.7378	3.16462	0.727
'Overall'	50	143.6542	19.48873	0.924

Materials and methods

In examining the influence of safety attitude amongst construction workers in relation to management support towards the promotion of positive safety climate, a cross-sectional study approach was adopted. The first section gathered related demographics from the workers while the subsequent sections sought the views of the participants regards existing safety climate in their workplace.

Survey design

The survey was conducted during the summer months of May–July 2021 and targeted construction workers with more than a year work experience, across the six geopolitical regions of Nigeria. A modified Nordic NOSACQ-50 questionnaire as proposed by Kines et al. (2011) was adopted to measure the safety climate of workers in their respective workplaces. The validated version of the survey instrument consists of 50 items categorized into 7 measurement scales (Table 1). The first three scales measured management's role in ensuring safety within the organizations while the remaining four scales measured respective worker's safety commitment and behaviour. Each item across the seven categories of the measurement scales was rated using a 4-point Likert scale of agreement, where '1 = strongly disagree', '2 = disagree', '3 = agree' and '4 = strongly agree'. Further questions regarding the distinct characteristics of the respondents that include years of experience, sector and whether the respondent holds a management role with their organization were considered (Moda, Dama, et al. 2021).

Validation of the questionnaire

The NOSACQ-50 questionnaire was reviewed by the authors and relevant sections were adapted to align with the perspective of this study. This was further assessed by a team of 15 construction professionals to evaluate the validity and reliability of the measurement items. Responses from the validation team were duly adjudged to satisfy the aim of the study. As such, no additional alteration was made. Authors jointly approved its adoption for the project. The original version of the questionnaire required no formal approval while copy right belongs to the Nordic Council of Ministers.

Pilot test

After the completion of the validation process, 15 randomly selected participants responded to the questionnaire and data were entered onto SPSS and negatively coded questions were reversed while both maximum and minimum values were checked for the entire dataset. Cronbach's alpha test results for internal consistency range between 0.659 and 0.735 across the

seven categories. As such, modifications to the questions were limited to rewording of few sections to meet requirements of the study.

Study population and sampling approach

Due to the lack of an official employment database in Nigeria, it was difficult to ascertain the actual number or construction workers across the country. However, it was previously estimated that the construction industry employed over 3.8% of the country's active population (Abubakar et al. 2018, Okoye et al. 2018). Based on this figure, the sample size of 385 was arrived at using the Fisher's formula for sample size calculation as adopted by previous similar studies (Moda, Nwadike, et al. 2021). To ensure that the maximum number required among the target participants is achieved, a purposive sampling technique was adopted for the study. Three sets of reach out approaches were considered. These include deliberate contact and sensitization approach across identified trade unions, the use of social media platform as well as putting up flyers out on identified construction sites. Inclusion criteria considered comprised workers above 18 years and those with work experience of more than one year in the industry who are literate. Overall, 500 questionnaires were distributed among construction workers and 82.2% (401) completed questionnaires were returned, which informed the outcome of the paper. Participation in the survey was made voluntary without the use of any form of incentive. Additionally, the protocol of the study was duly approved by the Faculty of Health and Education Ethics Committee, Manchester Metropolitan University (Project id: 34007) which is in accord with the Declaration of Helsinki.

Statistical analysis

The Statistical Package for the Social Sciences (SPSS) version 27 (SPSS Inc., Chicago, IL) was used to analyse the data after cleaning. The internal consistency of the scales considered was measured using Cronbach's alpha where higher alpha values (values closer to 1.0) indicate greater scale reliability.

To determine the demographic characteristics of the study population, descriptive statistical analysis, including frequencies and percentages were conducted. As part of inferential analysis for the data set, one-tailed *t*-test was adopted to define any statistical variances between the sets of measurement variables in the study. Pearson correlation was undertaken to help establish any possible associations between the seven safety climate scales considered in the study. Mean scores and standard deviations were analysed for all scales. Overall, a mean score of more than 20.0 was taken as good commitment level allowing for upholding and continuation of existing safety commitment. Relatedly, a one-way

Table 2. Demographic characteristics of the survey participants.

Variables	Frequency	%
Gender		
Male	355	88.5
Female	45	11.2
Prefer not to say	1	.2
Age		
18–27	82	20.4
28–37	203	50.6
38–47	67	16.7
48–57	35	8.7
58–67	14	3.5
Sector		
Public	42	10.5
Private	359	89.5
Work experience (years)		
0–1	31	7.7
1–10	307	76.6
11–20	60	15
21–40	3	.7
Managerial/supervisory role		
Yes	95	23.7
No	306	76.3

analysis of variance (ANOVA) was performed to ascertain variances across the means of workers' attitude within their organizations. The statistical significance for the ANOVA was defined at 95% with $p < .05$.

Results

Cronbach's alpha test of reliability

Table 1 presents the result on the latent variable reliability for each scale based on the Cronbach's reliability. The results indicate strong reliability among the seven scales with alpha values ranging from 0.727 to 0.859. Sets of variables that measured 'management safety priority, commitment and competence' consisting of nine measurement items ($\alpha = 0.859$) and 'management safety justice' (six items, $\alpha = 0.829$) were found to be highly reliable. The Cronbach's alpha for 'management safety empowerment' and 'trust in the efficacy of safety systems' with seven measurement items were 0.781 and 0.727 respectively. The overall NOSACQ-50 had excellent α score of 0.924 depicting the set of questions used as reliable.

Participant demography

The characteristics of the respondents are presented in Table 2. Based on the responses, 85.5% identified themselves as male and 11.2% identified their gender as female. Respondents who fall between 28 and 37 years of age constituted 55.5% of the total sample while respondents who fall within the 18–27 age bracket represented 20.4%. Additionally, majority (89.5%) of the participants were working on private construction projects while the remainder were working on public projects. Over three-quarters of the respondents reported having worked between 1 and 10 years within the industry, amongst whom only 23.7% identified themselves as holding managerial/supervisory positions.

Measurement of critical factors to improve workers' safety attitude

A one-sample t -test was performed to ascertain statistically significant difference between the seven scales used in the study. Table 3 shows that 'management safety priority, commitment,

and competence' ($M = 26.53$, $SD = 4.77$) was statistically significantly higher than 'management safety empowerment' ($M = 20.12$, $SD = 3.37$), $t(110.02) = p < .001$ among the sampled group. In addition, the participants' response around 'safety communication, learning, and trust in co-worker's safety competence' ($M = 24.24$, $SD = 3.41$) was found to be statistically higher than 'trust in the efficacy of safety systems' ($M = 18.33$, $SD = 3.14$), $t(140.23) = p < .001$ (Table 3). These results indicate that 'management safety priority, commitment, and competence' does have effect on construction worker's attitude towards safety which has the likelihood of influencing their safety behaviour. Specifically, the results indicate that where 'safety communication, learning and trust in co-workers' safety competence' are actively encouraged by the management, these will have significant effect on workers' trust on the value of safety schemes introduced by the management.

Correlation outcomes of seven safety climate scales measured

The Pearson correlation analysis ascertained the relationship between 'management safety priority, commitment, and competence' and 'management safety empowerment' as presented in Table 4. The results of the analysis show a strong positive correlation between the two variables ($r = 0.739$, $n = 292$, $p < .01$). In addition, 'trust in the efficacy of safety systems' and 'workers' safety priority and risk non-acceptance' were found to be moderately negatively correlated ($r = 0.392$, $n = 383$, $p < .01$) (Table 4). There was a moderately strong correlation between 'management safety empowerment' and 'trust in the efficacy of safety systems' ($r = 0.685$, $n = 382$, $p < .01$).

Analysis of variance comparing work experience and project type

The comparison between the effect of work experience in the industry and participants working on either public or private construction projects was done using a one-way ANOVA. From the result presented in Table 5, 'management safety priority, commitment, and competence' was found to significant effect on work experience ($F(3,388) = 6.687$, $p < .001$). *Post hoc* analysis using Turkey HSD indicates that the mean score for employees with 30–40 years of work experience ($M = -7.90$, $SD = 2.83$) was significantly different from those with work experience of 1–10 years ($M = 0.24$, $SD = 0.89$). Also, participants with 11–20 years ($M = -2.08$, $SD = 1.05$) work experience did slightly differ from those with 21–40 years of work experience. In addition, there was significant difference between management safety empowerment on employees working in either public or private sector projects [$F(1,391) = 12.04$, $p < .001$] (Table 5). Thus, it can be asserted that safety attitude of workers varies based on years of working experience, and the nature of work sector influences management role towards the promotion of safety climate.

Discussion

This study assessed the critical role of management support towards changing the safety attitude of workers in Nigeria's construction industry. Based on the findings, workplace safety in Nigeria, as is the case in several countries, has continued to be a major concern within the construction sector. Several studies

Table 3. T-test analysis for the seven scales used to measure critical factors to improve workers safety attitude.

Scale	<i>t</i>	<i>df</i>	<i>p</i> Value	Mean difference	SD	95% Confidence interval	
						Lower	Upper
1. 'Management safety priority, commitment, and competence'	110.015	391	<.001	26.5306	4.7746	26.0565	27.0047
2. 'Management safety empowerment'	118.335	392	.001	20.1196	3.3706	19.7853	20.4539
3. 'Management safety justice'	125.387	392	.001	17.1781	2.7159	16.9088	17.4475
4. 'Worker's safety commitment'	120.826	386	.001	18.2739	2.9753	17.9765	18.5713
5. 'Worker's safety priority and risk non-acceptance'	132.714	395	.001	18.2525	2.7369	17.9821	18.5229
6. 'Safety communication, learning, and trust in co-worker's safety competence'	140.233	389	.001	24.2410	3.4138	23.9012	24.5809
7. 'Trust in the efficacy of safety systems'	116.481	385	<.001	18.3278	3.1444	18.3278	18.9572

Table 4. Measurement of the degree of correlation between the seven safety climate scales.

Scale	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. 'Management safety priority, commitment, and competence'	26.53	4.78	1.000						
2. 'Management safety empowerment'	20.11	3.37	.739**	1.000					
3. 'Management safety justice'	17.18	2.72	.735**	.704**	1.000				
4. 'Workers' safety commitment'	18.27	2.98	.767**	.633**	.691**	1.000			
5. 'Workers' safety priority and risk non-acceptance'	18.25	2.74	.588**	.523**	.622**	.593**	1.000		
6. 'Safety communication, learning, and trust, in co-workers' safety competence'	24.24	3.41	.712**	.592**	.705**	.676**	.672**	1.000	
7. 'Trust in the efficacy of safety systems'	18.64	3.14	.685**	.556**	.580**	.719**	.392**	.672**	1.000

**Significant, $p < .01$.

Table 5. Summary of Analysis of variance for number of years spent in the construction sector and construction sector types measured against the seven-scale.

Scale	F-score (work experience)	Mean square	F-score (construction sector)	Mean square
1. 'Management safety priority, commitment, and competence'	F (3,388) = 6.687**	146.065	F (1,390) = 10.299*	229.327
2. 'Management safety empowerment'	F (3,389) = 4.986*	54.965	F (1,391) = 12.043**	133.064
3. 'Management safety justice'	F (3,389) = 5.996**	42.600	F (1,391) = 6.795	49.389
4. 'Worker's safety commitment'	F (3,383) = 9.066**	75.524	F (1,385) = 12.383**	105.645
5. 'Worker's safety priority and risk non-acceptance'	F (3,392) = 4.242	31.008	F (1,394) = 3.134	23.346
6. 'Safety communication, learning, and trust in co-worker's safety' competence'	F (3,386) = 4.196	47.720	F (1,388) = 26.301**	287.789
7. 'Trust in the efficacy of safety systems'	F (3,383) = 4.255	41.030	F (1,384) = 16.368**	155.628
'Overall'	F(3,345) = 8.043**	3182.198	F (1,347) = 19.130**	7630.570

* $p < .05$, ** $p < .01$.

have been undertaken to contextualize the level of safety concern and have suggested measures of safety improvement (Edwards and Nicholas 2002; Manu et al. 2021; Ibrahim et al. 2022). Construction industries around the globe have been plagued with abysmal safety performance, especially in developing countries like Nigeria which prompted several academic and legislative efforts towards improving the sector's performance. Findings from this study provide empirical evidence on the magnitude of relationship between management commitment and involvement in safety, and respective attitude of workers towards safety, especially in Nigeria.

The dominance of the male gender in the construction industry as evident among the respondents where 88.5% were male, did reflect the global picture. Norberg and Johansson (2021) reported that only 12.5% of construction workers are of the female gender in a global context. In addition, the ratio between public (10.5%) and private (89.5%) sector workers reflect the dominant role played by private organizations in the industry. This builds on the findings of Odediran et al. (2012) where it was reported that 95% of such private organizations are either small or medium-sized, employing not more than 50 employees. Relatedly, considering small and medium scale firms dominate the industry, and a sizable number (20.4%) of the study participants fall within the age band of 18–27 years, with majority (74.7%) having work experience of barely 1–10 years, there is apparent high likelihood of safety risks in the industry due lack of familiarity with common safety hazards and required safety

practices (Tadesse and Israel 2016). Such workers generally lack required safety trainings that will enable them recognize safety hazards effectively.

Undoubtedly, the lack of strong safety policy enforcement and implementation has impeded on the zeal of construction organizations to institute safety standards in their organizational policies (Adeyemo and Smallwood 2017). However, management support has been identified by several studies as a critical factor for improving safety performance across organizations (Neal et al. 2000; Vinodkumar and Bhasi 2010; Hofmann et al. 2017). There was a strong positive correlation between 'management safety priority, commitment and competence' ($r = 0.739$, $n = 292$, $p < .001$) and 'management safety empowerment'. An earlier study by Cheng et al. (2018) observed that management commitment to safety has a weak relationship with safety performance of organizations in the Malaysian construction sector. These outcomes highlight the vital role that management can play towards the enhancement of safety climate within their respective organizations through actively translating ideas into safety actions. Erickson (1997) also emphasized the need for an active, genuine and continued support from management towards providing a safe, healthful working environment for employees.

Relatedly, 'safety communication, learning, empowerment, and trust' actively promoted by the management have significant impact on workers' trust in the efficacy of safety systems within an organization. Safety commitment is considered an imperative variable in the dynamics between management promotion of

positive safety culture and workers' safety attitude within an organization. Previous studies assert that employees' safety performance is a precursor to having an enabling work environment that empowers workers and promote mutual trust across the organization (Törner and Pousette 2009; Kines et al. 2011). Along this line, the result from this study found strong positive correlation ($r = 0.719$, $n = 377$, $p < .001$) between employees' ability to influence their peers to complement management commitment towards their safety.

Lastly, it is evident that there are varying levels of management safety empowerment for workers in public and private projects [F (1,391)=12.04, $p < .001$]. The implication of this finding is the existence of safety commitment disparity between clients of public and private construction projects in Nigeria. This is in line with the affirmation by Umeokafor (2018) that public clients' health and safety commitment and attitude in the country outweighs that of private clients as evidenced in their approach towards the promotion of positive safety culture, accident investigation, clients proactive auditing of contractor's health and safety records keeping. Other studies have identified related factors that promote this disparity to include difference in bureaucracy, project motives, finance (Umeokafor 2018) as well as attitudes towards health and safety standards (Leather 1988; Huang and Hinze 2006; Liu et al. 2017). To advance positive safety attitude across construction organizations in Nigeria and around the globe, it is evident that management safety commitment should be visible at every stage of the construction cycle. This paper has advanced new thinking in safety attitude enhancement amongst construction workers and holds the potential for improving management safety commitments. This is duly important especially as the country has been faced with building collapse at various construction stages, as well as high incidence of workplace accidents which in most cases, go undocumented.

Conclusion

The article provides a framework for the evaluation of critical factors associated with construction safety management strategy towards enhancement of workers' safety attitude. Despite the strides achieved in the development of safety management tools and techniques, and the institutionalization of various global safety standards and legislations, very little progress has been made in the overall safety performance within the Nigerian construction industry. Considering the complex operations taking place all at once during any construction project, there is the need for collective aspiration from all relevant organizations and agencies to promote safety at work, while advancing measures that offer guide around workers' actions and ensure their commitment to safety. The problem of workers' non-compliance to safety measures in Nigeria is largely attributed to negative safety attitude, which is seen as a manifestation of management's lack of commitment towards the promotion of safety climate. As a result of the persistent rate of building collapse and work-related accidents within the industry, there is need for organizations to exert more efforts towards advancing measures that will help promote positive safety attitude at work, thereby improving compliance rate and overall safety performance. In the light of this, the study has further advanced the debate around the practicality of advancing positive attitude and behaviour of workers in construction organizations, through continuous efforts and empowerment on safety-related issues by the management of such organizations in Nigeria.

Overall, the lack of focus on the role of national culture as a contributor to employee safety attitude and the role individual belief plays in defining safety perception are apparent limitations to this study. However, it is the candid opinion of the authors that these factors play important roles in shaping safety behaviour of construction workers within the country. Hence, further study is recommended to take into consideration the role played by national culture and personal belief on the promotion of workplace safety measures in addition to management commitment and workers' safety engagement.

Acknowledgements

Special thanks to Department of Health Professions, Manchester Metropolitan University for providing the platform to undertake the research that informed the outcome of the paper.

Disclosure statement

No potential conflict of interest was reported by the authors.

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