

A qualitative review of effectiveness of Covid-19 protocol on construction sites: A case study of Lagos State

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ABSTRACT

Nigerian's construction sector is a key to the development of national economy. The sector is also known for employment creation and value addition to her national domestic product. None the less, the industry is notorious for its poor site worker's health, safety and well-being (HSW). Thus, the case of construction site workers' HSW became worse during the global COVID-19 pandemic that disrupted global economies and claimed millions of lives. The unique nature of construction sites operations could pave way for the spread of COVID-19. Therefore, this study which follows phenomenological approach obtained information that highlights the various measures taken to reduce the spread of COVID-19 among small, medium and large construction enterprises in Nigeria. The findings suggest that COVID-19 transmission and infection control measures among the small and medium construction enterprises in Lagos Metropolis are completely absent; while among the large firms there are measures such as mandatory face masks and medical teams for emergencies.

Keywords: COVID-19, construction sites, impacts, Nigeria

1. INTRODUCTION

The Nigerian construction industry is a key to the development of national economy and employment creation and value addition to her national domestic product (Okorie & Aigbavboa, 2016). It contributes about 25% of the total gross domestic fixed investment and employs approximately 3,500,000 both skilled and unskilled workers (Okorie & Aigbavboa, 2016). According to the International Labour Organisation (ILO, 2020), before the COVID-19 pandemic, the construction sector in many countries accounted for about 7.7% global employment with the projection of 12 % in 2030 indicating that the construction sector would contribute to 17.4% of global gross domestic product (GDP). Regrettably, the COVID-19 pandemic that ravaged the World economies has led to the disruption of construction activities and millions of lives lost.

On its (2021) sectorial brief on impact of COVID-19 in construction, the ILO posits that the pandemic and its disruption impacted negatively on the construction sector, particularly on HSW of site workers. Studies conducted in Nigeria (Olatunde et al., 2022; Alozie et al., 2021) and in Malaysia (Zakaria &

Singh, 2021) on the effects of COVID-19 on the construction industry indicated that the pandemic led to construction projects suspensions, delays, time and cost overruns. At the same time, shortages of construction materials and other inputs due to disruption of the global supply chain and loss of revenue to contractors and subcontractors were noted by the ILO, (2021) as impacts of COVID-19 on the construction industry. Undoubtedly, the devastating effects of COVID-19 have severe consequences on human health and the global economy (ILO, 2021; Alozie et al., 2021).

In a developing country like Nigeria, the case of construction site workers' HSW became worst during the global COVID-19 pandemic. According to Okorie and Musonda, (2019), the construction industry in developing countries is typically underdeveloped and dysfunctional. In addition, several of the developing countries, especially those in Sub Saharan Africa, do not have the capabilities and technologies to cope with such global threatening diseases as COVID-19 (WHO, 2020; ILO, 2020). Thus, construction site workers' HSW in the developing countries like Nigeria did not receive the desired attention, particularly the small and medium construction enterprises during the peak of COVID-19 when compared with what took place in the developed countries like the United Kingdom (UK), United States of America (US), Germany, Russia etc during the peak of COVID-19 (ILO, 2021).

However, in handling a pandemic, such as COVID-19, its spread must be contained to reduce the impact on the economy, society and human health. This called for in depth research on the adaptability, effects and prospects, consequences, potential risk, control measures and impacts of COVID-19 on the construction industry. Previous studies on COVID-19 in developing countries has been largely on the impact of the pandemic as it affects the performance of construction projects and this has been limited to indigenous construction companies (Olatunde et al., 2022). The study by Gamil and Alhagar, (2020) examined the impact of COVID-19 on the survival of construction industry but did not interrogate the various measures taken to reduce the spread of COVID-19 among small, medium and large neither did it investigated the impact of the pandemic performance of construction site workers. This study is conducted to investigate the various measures taken to reduce the spread of COVID-19 among small, medium and large construction enterprises in the Lagos State of Nigeria and how the transmission and infection affect construction site workers' performance.

Literature Review

Effect of COVID-19 on the construction sector

In December 2019, the World came to witness a deadly and devastating disease that started in the Region of Wuhan, China named COVID-19, which is the shortened form of "corona virus disease of 2019" (Alozie et al., 2020; WHO, 2020). Within one month, the disease spread across the World like wildfire. Thus, the rate at which this disease spread globally prompted the WHO to declare it a pandemic on 11th March 2020 (WHO, 2020). The rate of transmission and infection continued to rise globally as the total number of infected persons Worldwide stands at 10 million as of 30th June 2020 (WHO, 2020; Alozie et al., 2020). According to the WHO, (2020), the recent figure as of 21st January 2021, the virus has infected 95,612,831 people globally and 2,066,176 people have died of the COVID-19 infection.

Sequel to this, different countries spring up for action. Then the Federal Government of Nigeria signed the COVID-19 Disease Health Protection (DHP) into law that imposed guidelines on activities of all economic sectors, construction industry inclusive Federal Republic of Nigeria (FRN, 2021). Regardless of these rules, regulations and imposed Movement Control Order (MCO) there were increasing cases of confirmed deaths across the Nigerian States. However, the strictness of MCO is dependent on the severity of the public health crisis of each country. None the less, in some countries, construction activities were deemed essential. For instance, the timely construction of emergency facilities and hospitals was given priority in some countries (ILO, 2020). For example, in China and Italy construction sector was exempted from lockdown to meet up with the timing and construction of emergency facilities and hospitals (ILO, 2020). Following the imposition of MCO, in Nigeria there was a serious economic downturn in investment, loss of revenue and reduced income in all aspects of human enterprises including the construction industry.

In fact, the negative effect of the COVID-19 pandemic on global economies and the loss of human lives are unquantifiable. In Nigeria, the case of construction site workers' HSW became worse. In addition, construction projects encountered delays in completion period or suspension, loss in revenue to clients and contractors, cases of disruption in materials supply chains and shortage in the workforce are the corresponding negative effects of the COVID-19 pandemic in Nigeria's construction industry. None the less, the COVID-19 effect varies from one sector to another but has been significant in the construction industry due to its peculiar nature (Alozie et al., 2020). The truth of the matter is that construction activities in developing countries like Nigeria is less mechanized and labour intensive, while most of their operations are carried out in enclosed environments. The ILO, (2021) states that the industry is known for employing a large number of people with diverse range of skills to achieve the aim of the projects.

Consequently, the people in construction (PiC), materials suppliers' merchants and society at large were negatively impacted by the COVID-19 pandemic. The ILO, (2020) and WHO, (2020) noted that the COVID-19 outbreak exacerbated the poor health and safety that the construction industry is known for.

Effect of COVID-19 on construction enterprises

The effect of the COVID-19 pandemic on construction enterprises has been significant, with many facing liquidity problems (ILO, 2021). There is a drastic reduction in spending and consumption capacity among the enterprises and other stakeholders due to restrictions on the movement of goods and services for fear of infection. The International Monetary Fund (IMF, 2021) reports on Policy Responses to COVID-19 state that liquidity shortages threaten the sustainability of small and medium enterprises (SMEs), especially in developing countries like Nigeria. The ILO, (2021) identifies SMEs bankruptcy as one of the growing negative impacts of COVID-19 on the global economy if the pandemic continues. On face this, construction enterprises had to pay higher price on wages and salaries due to the Covid-19, besides facing other issues such as high rates of mortality and morbidity among workers (Alara, 2021).

Effect of COVID-19 on construction materials supply chain

Construction activities are severely affected by the COVID-19 pandemic and its disruption of global supply chains, with shortages of building raw materials and other inputs (ILO, 2021; WHO, 2021). Some building material supply chains have suspended production and distribution (Alara, 2021). According to Kukoyi et al., (2021), managing the risk and challenges occasioned by COVID-19 among SMEs and large construction enterprises in Nigeria includes delays and increasing costs of imported raw materials and off-site construction components, as many factories have been closed down. In addition, bans on transportation of goods and persons across the 36 states of the Nigeria Federation slowed down project delivery period, equipment manufacturers and equipment rental services (Alara, 2021; Kukoyi et al., 2021).

Effect of COVID -19 on construction professionals/consultants

Globally, PiC and Builders render both tangible and intangible services to clients and contractors for efficient and timely delivery of construction projects. According to the ILO, (2021), disruptions of construction activities occasioned by the global COVID-19 pandemic have severely impacted the ongoing projects in different countries which lead to cancelling or suspension of the project during the MCO period. In Nigeria, approximately 12,786 of different consultants were contacted for work, regrettably only 2,120 submitted quotations within the period (Alara, 2021).

Luo et al., (2020) identified challenges facing the design and construction of the Leishenshan Hospital building in Malaysia during the COVID-19 pandemic as project delay and design optimization and communication of project information among project stakeholders. Sharing crucial project information among the professionals was hampered by the limitation on the movement of people, products and services brought on by the pandemic. Similarly, due to the MCO order enforced by the Nigerian government, consultants hired by the clients for efficient site supervision may not be on the project's site.

Effect of COVID-19 on construction site workforce

Rural migrant workers have always been a source of regular and cheap labour to the construction industry in urban cities (Okorie and Smallwood, 2011). The use of unskilled rural migrant workers for construction work in urban cities is a global phenomenon. These groups of rural migrants migrate to urban areas in pursuit of better opportunities. Consequently, the COVID-19 changed the narrative, as the HSW of construction site workers were seriously impacted.

Sequel to this, the Nigerian government saw the urgent need to protect the HSW of the PiC in the face of a widespread and increasing number of deaths caused by the COVID-19 in the country. Therefore, in line with the WHO, (2020) and ILO, (2020), the COVID-19 global response strategies for workplaces and the Federal Government of Nigeria COVID-19 regulations, the basic requirements for COVID-19 H&S procedures should be strictly observed by both the SMEs and large construction enterprises in Nigeria. Thus, some of the basic regulations are discussed below.

Temperature Testing and Health screening of worker

The World Health Organisation (2020) and International Labour Organisation (2020) in response to the COVID-19 global pandemic came up with health policies to contain the transmission and infection of COVID-19. In response to the devastating effects of COVID-19 in Nigeria, the Federal government signed the COVID-19 Disease Health Protection Regulations into Law. One of the policies in the regulations is testing the temperature and health screening of workers as pre-conditions for entry into the work sites,

business premises, restaurants, offices, schools etc. Thus, this code of practice becomes the norm that a person can only be admitted into any work environment with a temperature of 38 degree Celsius. In addition, this protocol is compulsory for rural migrant workers to undergo temperature screening to ensure they are free from COVID-19 infection. According to the ILO, (2020), construction site operations by its very nature are labour intensive, therefore, workforce shortages translate to the high cost of labour, delay in project completion time and loss of revenue to property developers.

Wearing of Nose mask

Nose mask wearing has become a new norm on construction sites, in addition to other personal protective equipment (PPE) ILO health and safety standards. In order to reduce the spread of COVID-19 in work environments, employers must provide and educate workers on the need to put on their nose masks as the requirement of the hygienic standard and H&S work practices. The construction site is notorious for its poor H&S practices the use of nose masks on-site could improve workers' H&S performance.

Social distancing

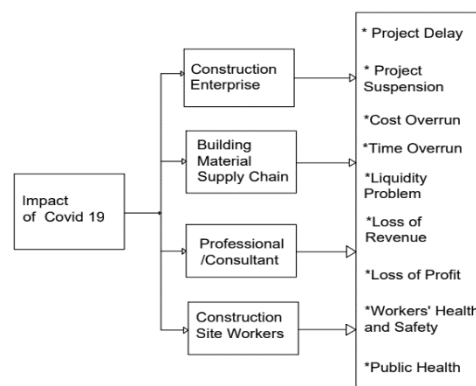
Social distancing in the work environments came as a result of the COVID-19 pandemic outbreak. Thus, COVID-19 has significantly impacted the way humans interact and socialise in their daily activities and in the workplace environment (Onubi et al., 2021). The infected countries developed a variety of preventative and containment measures against the development of COVID-19 in order to slow the rapid spread of this deadly disease. As a result, SMEs and large construction companies must deal with new legal and non-pharmaceutical interventions including social distancing.

Construction site operations by its nature require a huge workforce to complete assigned duties in a timely manner. The (WHO, 2020); (ILO, 2020) and (FRN, 2020) on COVID-19 Disease Health and Protection mandates that workers should maintain social distancing. Reducing the workforce on construction sites to comply with social distancing requirements, according to (Zakaria and Singh, 2021), will undoubtedly have a negative effect on the time it takes to complete projects. Additionally, there might be delays brought on by cutting back on staff members owing to social distance, which would result in cost and time overruns.

An illustrated effect of COVID-19 on Nigerian construction sites

The outbreak of COVID-19 brought untold hardship to the World economy and human health. According to the WHO, (2020) people died in millions daily, particularly the aged ones and also the World economy was brought to a standstill. Consequently, there is a drastic reduction in consumption of goods and services, a hike in business operating costs, disruption of the labour supply chain and poor health and safety of people. The devastating effects of COVID-19 have negative impacts on construction enterprises; the building materials supply chain and the HSW of construction site workers (Olatunde et al., 2022; ILO, 2020). Alara, (2021) and Kukoyi et al., (2021), observed that COVID-19 caused the closure of workplaces, poor economic prospects, travel restriction of both persons, goods and services, low productivity, hardship to families, rise in H&S management budget to governments at all levels and high cost of operations.

In the face of these global calamities, the WHO, (2020) and ILO, (2020) came up with policy guidelines on H&S measures to adequately contain the COVID-19 pandemic globally. In a similar line, COVID-19 Regulations of Disease Health Protection were released by the (FRN, 2021). However, the nature of construction site operations and the setting that brings workers together could put them at high risk of exposure to COVID-19. Consequently, small, medium and large construction enterprises in Nigeria are impacted negatively as illustrated below in Figure 1.



Source: Researchers' Construct (2022)

Figure 1 An illustration of the impact of COVID-19 on Nigerian construction sites

2. METHODOLOGY

The sample for the interviews was chosen among thirty-five PiC to facilitate in-depth discussion and wider analysis of the major issues. The sample selection criteria include interviewees' knowledge in their fields, currently working on a construction site in the study area: The Lagos State of Nigeria. Lagos State is commercial hub of Nigeria. Thus, most construction enterprises have Headquarters in Lagos metropolis (Olatunde, 2019). Therefore, the sample criteria were in line with the research topic that seeks to investigate the various measures taken to reduce the spread of COVID-19 among SMEs and large construction enterprises in the Lagos State of Nigeria and how the transmission and infection affect workers' performance. The purposive sampling technique was used to draw participants from SMEs and large construction enterprises within the study area. It is notable that participants that work for large firms were managers that are saddled with contract administration responsibilities that include workers' HSW, whereas participants from the SMEs were owners and site supervisors whose responsibilities included staffs' HSW. Although fourteen construction enterprises (small, medium and large) were contacted at the beginning of the fieldwork, only six firms agreed to take part in the study. From the six firms, two interviewees were purposively selected (one from the senior management cadre and the other from the junior site worker). The essence of this was to ensure a balance opinion from both categories of workers. The decision to proceed with the twelve participants was made based on the fact that the study at this stage is exploratory and that a phenomenology-based study can be conducted with six participants (Flick, 2014). In addition, the limitation on social gathering as a result of COVID-19 protocol and the peculiar nature of construction projects operations make for adopting interview protocol for the study (Olatunde et al., 2022; Okorie et al., 2014). Thus, the interviews and discussions were conducted with due regard to ethical considerations governing this type of study.

The choice of semi-structured interview was employed because it offers sufficient flexibility to approach different respondents. A semi-structured interview questions were developed from relevant literature to guide the discussions. The primary sources of the interview questions included an exhaustive literature review on the impacts and effects of COVID-19 on Nigeria's construction industry (Alara, 2021; Kukoyi et al., 2021). In addition, the questions allowed participating contractors, managers and supervisors and site workers to discuss the use of thermal reader, attitude of construction site workers towards the use of face masks on-site, social distancing, productivity and obstacles in reducing COVID-19 transmission and infection among construction site workers in Nigeria.

The questions were structured to elicit responses from the PiC on what ways COVID-19 can be effectively managed by SMEs in the Nigerian construction industry. Interviewees were informed of the voluntary nature of their participation and they were assured of the confidentiality of their comments. The discussions with each interviewee were recorded on iPhone with the permission of the interviewee before transcription. The opinions and suggestions of the interviewees were recorded on iPhone. The researchers then captured the data on the computer after each interview. The principal investigator listened several times to the recorded opinions and suggestions and personally transcribed them. To enhance the validity of the findings, the transcribed versions were sent to the participants/interviewees who indeed vouched the accurate versions of discussions were obtained. After the transcription of the data, the analysis thereof brought about the identification of major themes in the form of:

Lack of thermometer temperature reading equipment;

Poor attitude of construction site workers towards the use of nose mask;

Social distancing and construction site worker's productivity and

Obstacles in reducing COVID-19 transmission and infection among construction site workers.

3. RESULTS AND DISCUSSION

Background to the interviewees

Table 1 depicts the characteristics of the interviewees. The assessment of the educational qualifications of the interviewees shows that they have the requisite educational qualifications to be able to supply the information required of them as they have educational certificate ranges from National Diploma (33.3%), Higher National diploma (16.7%), Post Graduate diploma (25.0%), Bachelor Degree (16.7%) and 8.8% have Masters certificates. The majority (41.6%) of the interviewees have been in the construction industry for between 6 and 10 years while only 16.7% of the interviewees have experience of between 1 and 5 years in the construction industry. The analysis of the designation of the interviewees shows the interviewees cut across the targeted group (senior professionals and junior construction professionals). The designation of the interviewees ranges from health and safety managers (8.3 %), project engineer (8.3%), Chief Architect (16.7%), Project Manager (16.7%), Foremen (25.0%) and Gang leader

(25.0%). From this background therefore, it could be deduced that the interviewees are eminently qualified to supply the information required of them and that the information they supplied could be rely on.

Table 1 Characteristics of interviewees

Category	Classification	frequency	percentage
	ND	4	33.3
Highest academic qualification	HND	2	16.7
	PGD	3	25.0
	B.Sc /B.Tech.	2	16.7
	M.Sc./M.Tech.	1	8.3
	Total	12	100
Construction work experience	1-5	2	16.7
	6-10	5	41.6
	11-15	3	25.0
	16- 20	2	16.7
	Total	12	100
Designation	Health and Safety Manager (HSM)	1	8.3
	Project Engineer (PE)	1	8.3
	Chief Architect (CA)	2	16.7
	Project Manager (PM)	2	16.7
	Foreman (FM)	3	25.0
	Gang Leader (GL)	3	25.0
	Total	12	100

Effectiveness of Covid-19 protocol on construction site

Lack of thermometer temperature testing equipment among construction enterprises

The use of thermal readers has become a norm for entry into general workplaces and construction sites. The interviewees were given a question to answer. Does your business employ medical personnel with experience with thermometer temperature testing tools?

One of the managers from the large company answered in the affirmative. *“My company has thermometer temperature testing equipment used by our medical trained personnel on-site”*.

In contrast to this answer, a supervisor from one of the small construction enterprises has contrary views. *“My company does not have thermometer temperature testing equipment for screening of workers before entry site for work”*. Another supervisor from one of the medium enterprises corroborated what he has said and went further to say. *“My company do not have thermometer testing equipment and trained medical team for COVID-19 disease surveillance”*

The International Monetary Fund (IMF, 2021) reports on Policy Responses to COVID-19 states that SMEs, especially in developing countries lack capacity and technology to contain with COVID-19 pandemic. The WHO, (2020) describes COVID-19 pandemic as a desert to global economy and a threat to human existence.

The poor attitude of construction site workers towards the use of face mask

The need for a drastic attitudinal and behavioral change among people to prevent and minimize the widespread of COVID-19 was a necessity especially on the mandatory wearing of face masks in the public spaces.

A question was posed to the interviewees. Does your company fully comply with the Federal Government regulation for compulsory face mask-wearing in public space? One of the site supervisors from large firms responded and stated: *“Yes, we are compliant with the government rules on wearing of face mask”*. *“Our company is very strict in ensuring that everybody on site is wearing their face mask because it is helping us to eradicate the spread of COVID-19 among our site workers”*. *“In addition, I am personally aware of a person who has died of COVID-19 disease, so it is not a joke or conspiracy theory”*. *“If I found anybody on-site without a face mask, I will order the person to leave our site immediately and report it to my project manager”*. *Statements of construction site workers from SMEs were different “For me, I am just wearing the face mask because my supervisor made it compulsory for site workers”*. *“Wearing a face mask is not because of the Nigerian government rules on COVID-19 disease, I don’t care about COVID-19, I am only interested to work and earn money”*.

In addition, a site supervisor from one of the small firm responded with these statements: *“COVID-19 disease is a rich men disease and it has nothing to do with us because we are poor”. COVID-19 kills only rich men in Nigeria”. “Let me tell you something, once I leave this construction site, I don’t wear any face masks because it is difficult for me to breathe properly, and I cannot get it and I don’t believe even that COVID-19 exists”.* COVID-19 has posed serious threat to people’s health and countries’ healthcare systems.

Despite, several academic studies substantiating that wearing of a face mask can effectively reduce infection and mortality rates resulting from COVID-19, some individuals still believe that COVID-19 is Whiteman tricks to drastically reduce African population (Esmailzadeh, 2022).

Social distancing and construction site worker’s productivity

Government compulsory regulation on social distancing in places of gathering and workplaces was adopted as one of the proactive measures towards minimizing the rate of COVID-19 transmission and infection. Questions were posed. How does your company enforce social distancing among construction site workers and its impact on productivity? A Project manager from one of the large firms made the following statements:

“In our company, we strive earnestly to maintain a reasonable social-physical distancing in accordance with the government regulations, but occasionally it was very difficult to maintain social distancing on-site due to the nature of our work”. “Site productivity and project delivery timeline has been affected greatly because we only employed a few site workers in order to keep with the social distance rules”.

Two site supervisors from SMEs expressed their views in this way

“The issues of social distancing within construction sites have made it very difficult to effectively control site workers to optimal productivity and to keep projects on track since the COVID-19 saga”. One of the supervisors went further to state that:

“Our site operations have been negatively impacted since the outbreak of COVID-19”. “There are great loss huge hours of the workforce, low productivity, and challenging financial sustainability as a result of maintaining social distancing regulations on our project activities”`

The construction industry depends on the high productivity of site workers to remain financially sustainable. Undoubtedly, COVID-19 has significantly disrupted the way in which construction projects and the workforce are organised and managed. Onubi et al., (2021) posit that construction industry globally witnessed low workers’ productivity as a result of adhering to mandatory preventive measures such as social distancing, which resulted in projects completion delay, time and cost overruns.

Obstacles in reducing COVID-19 transmission and infection among construction site workers

The peculiarity of construction sites operations posed serious challenges to effective control and management of COVID-19 transmission and infection, as its spread invokes direct human contact with infected persons and through airborne transmission when talking, coughing or sneezing. A question was then asked. What are some of the key barriers and obstacles towards effective control of COVID-19 transmission and infection in your construction site?

A site supervisor from one of the large construction firms made the following statements

“Enforcing face mask-wearing on-site sometimes makes it difficult for workers to effectively communicate orally and occasionally some workers would consciously or unconsciously remove their face masks, therefore endangering and posing a health risk to themselves and other workers”

For me, I don’t believe in this COVID-19 stuff and forcing workers to wear face masks doesn’t make sense because there is no COVID-19 in Nigeria. *“All these measures in place are tools state governments are using to get money from the Federal Government”*

A site supervisor from one of the SMEs made the following statements

“In my company, we do not have trained medical surveillance team, and thermal testing equipment are inadequate for testing everybody entering the sit”. “Also occasionally we may be in shortage of face masks and hand sanitizers” We understand that these lapses are potential ways COVID-19 infection can spread among us, but there is nothing we can do because management and clients want us to deliver their projects” project managers from a medium-firm.

The above statements made by interviewees validate ILO, (2020) sectorial brief on impact of COVID on construction sector. Some notable critical barriers while implementing COVID-19 preventive measures were poor safety culture, absence of medical personnel particularly among the SMEs, inadequate resources like thermal testing equipment, The ILO further noted that these daunting challenges were particularly prompt in developing countries which created barriers to adhering to measures shared by the WHO in containing the spread of COVID 19.

4. CONCLUSIONS

There were concerns about the extent and nature of compliance of COVID-19 preventive and protective measures among SMEs and large construction enterprises in Lagos State, Nigeria. There is evidence from the study findings that SMEs construction firms and their construction workers lack adequate resources and critical knowledge to effectively manage and control the spread of COVID-19 among construction workers in comparison with large firms that are moderately resourceful and knowledgeable with regard to effective measure to reduce the spread of COVID-19. The study findings revealed that there is general inadequate safety culture, and poor attitudinal and behaviour changes among SMEs construction firms and their site workers towards adjusting to the COVID-19 protocol on wearing face masks as many complains of the discomfort of face mask and conviction on conspiracy theory about COVID-19, whilst the large firms are most strict in enforcing of wearing face masks among its workers. Thus, the study has alluded to those challenges faced by SMEs for not adhering to wearing face masks may be linked to a lack of business structure and chain of command among them.

The issue of social distancing has negatively impacted on construction productivity was generally acknowledged by both SMEs and large construction firms in Lagos State, as it was difficult to effectively control project activities. The idea to drastically minimise the widespread of COVID-19 transmission and infection among PiC in Nigeria through the adoption of COVID-19 protective and preventive measures proved challenging as its implementation met barriers such as lack of adequate resources, poor safety culture, lack of trust in public/government regulations, misinterpretation and misinformation of seriousness of the threat of COVID-19 and its devastating impacts on human HSW.

Ethical approval

Not applicable.

Informed consent

Not applicable.

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Conflicts of interests

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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