



COVID-19 PROTOCOLS: ASSESSING CONSTRUCTION SITE WORKERS COMPLIANCE

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ABSTRACT

Purpose: The paper investigates construction site workers' compliance with various Covid-19 protocols while working on construction sites.

Design/methodology/approach: This survey was conducted after the ease of lockdown following the Nigerian first upsurge of the covid-19 pandemic. The survey research method was adopted for the study using a structured questionnaire administered to two hundred and forty-six construction site workers under strict covid-19 preventive measures. The data were complemented through personal observations of the study site activities. The results were analysed using frequency tables and a factor analytical approach.

Findings: The preventive measures in place on construction sites can be classified into personal protective measures, good etiquette/manners, contact precautions, and prompt actions. Although the workers claimed to be aware of the covid-19 pandemic, their disposition towards the preventive measures on construction sites is worrisome. Hence their level of compliance with the protocols.

Research limitations/implications: The research results may lack generalisability due to the study's location. Therefore, researchers are encouraged to evaluate the compliance level further in other places. This will help draw comparisons from the different areas investigated.

Originality/value: This paper fulfils an identified gap to study the need to promote public health by mitigating the global pandemic's spread in areas where social distancing cannot be easily observed.

Keywords

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INTRODUCTION

The novel Covid-19 (Coronavirus) pandemic has redefined people's physical interaction in the workplace. The pandemic led to many lives lost, and as of now, people's fear of contracting the disease keeps rising. According to [Ogunnusi et al. \(2020\)](#), new terminologies that emanate from the pandemic's aftermath and are commonly used in all sectors, including the construction industry, include but are not limited to self-isolation, COVID-19, quarantine, social distancing, palliatives, and furlough. The construction industry's activities are inevitable in nations of the world. The term that stand out amongst those used is "*social distancing*". Despite its enforcement at all levels, one could wonder whether this could be achievable in the construction industry.

The industry and its services have been reshaped by the pandemic outbreak that hit all countries. The construction industry attracts many personnel at various levels and stages, working together to actualise development projects. According to [Gamil & Alhagar, \(2020\)](#), unlike other industries, the construction industry typically requires the project members' presence and onsite involvement. This necessity increases site workers' exposure to the deadly coronavirus, especially where safety measures are not strictly observed. With the outbreak of the deadly diseases, construction site workers are increasingly exposed to the pandemic due to their mode of operation mode. Although COVID-19 broke out in December 2019 in Wuhan, China, the first case in Nigeria was recorded in Lagos State on the 27th of February 2020, with many cases recorded after that ([Ezeokoli et al., 2020](#)). The menace of Covid-19 cannot be overemphasized as many are dying daily, even among the health workers.

The disease is contagious and spreads through respiratory droplets resulting from sneezing, coughing, conversation, or abnormal breathing. There are also complex societal issues around ill workers who feel that they must work due to the fear of being sacked, economic or other reasons, thereby increasing the risk of exposure of their colleagues to the disease. Covid-19 is a public health emergency that requires one needs to evaluate and manage whatever risks that may arise from there. Therefore, to curb its spread, the World Health Organisation provided guidelines that must be strictly observed. Such guidelines include but are not limited to maintaining two-metres physical/social distancing between people and the use of a face and nose

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3 mask. Other guides include frequent hands washing using soap with water and
4 disinfecting with hand sanitizer. Despite these guides, many nations have experienced
5 the second wave of Covid-19 pandemic after the relaxation of various governments'
6 initial lockdown decision. The flagrant violation of the covid-19 protocol led to the
7 second wave of the disease, causing another lockdown phase in most nations.
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13 Construction-related activities contribute to the workforce that sustains every nation's
14 growth. Therefore, there is a need for the sector to reflect on the risks to their
15 employees. The firm is legally responsible for protecting its workers and others from
16 the risk that could affect their health and safety. This meant employers must consider
17 their workers' risk and do everything reasonably practicable to minimize or prevent
18 them, since it cannot be totally eradicated for now (Wong et al., 2020). Jamaludin et
19 al., (2020) posited that a new normal system occasioned by Covid-19 is emerging. It
20 is evident that the fight against the pandemic is far from being over. Therefore, people
21 must learn to live within the new realities as the social and economic activities
22 resume.
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33 The construction workers comprised mainly of artisans and site engineers and
34 supervisors. As a group of construction workers, the artisans are the major player who
35 execute construction processes and activities while the engineers and supervisors as
36 another group work directly with the artisans to oversee their activities (Maloney,
37 1983). This group act as an intermediary between the management and the artisans.
38 The disposition to worker's health and safety during construction works can determine
39 how the diseases will spread between them and their contacts because they work from
40 one construction site to another. During this pandemic era, numerous researches have
41 been done to examine COVID-19 and its implication on different sectors. However,
42 investigations on the deadly virus in the construction industry are limited, particularly
43 in Nigeria. There is a need to fill this research gap, mostly due to the uncertainty
44 surrounding the pandemic's present situation. Therefore, it is imperative to investigate
45 the awareness and compliance of construction site workers in Lagos State, Nigeria,
46 with the Covid-19 protocol to promote health and safety while delivering
47 development projects.
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LITERATURE REVIEW

There is a potential knowledge gap on how feasible and practicable to apply Covid-19 measures within the construction industry. This is more difficult, especially if one considers the project's to be executed and the working arrangements' complexity (Stiles et al., 2021). The health condition of workers is directly related to their level of productivity. According to [Olukolajo et al. \(2013\)](#), the state of people's health can influence a country's economy, and a healthy workforce is a requirement for a vibrant economy. The resultant impact of the covid-19 pandemic on human health has its implication on many sectors of the economy. [Ogunnusi et al. \(2020\)](#) observed that the pandemic affected human health, businesses, and operational health of organisations', including the construction industry. The pandemic can cripple the construction industry, leading to project suspension/abandonment, financial implications, unpredicted socio-economic consequences, job loss, time, and cost overrun ([Gamil & Alhagar, 2020](#); [Bsisu, 2020](#)). Studies have also suggested that a possible economic depression might follow this pandemic. Therefore, the construction industry needs to devise plans to control this undesirable economic consequence.

The way site work is organised could affect workers safety and may have its toll on covid-19 ([Stiles et al., 2021](#)). Virtually all projects on construction sites are achieved through site workers joint participation. [Afkhamiaghda and Elwakil \(2020\)](#) investigated the preliminary indexes that can aid the spread of the virus in the construction industry, found that the work's volume, the job site location, and the worker's daily activities can speedily spread the virus. [Ezeokoli et al. \(2020\)](#) also investigated the application of covid-19 safety rules among construction workers in construction sites and affirm that maintaining stay-at-home policy when sick, using face-shields, placing hand sanitisers, and wash hand basins in different and strategic locations are essential on construction sites. They also revealed that maintaining a daily attendance log for staff and visitors and using personal protective equipment provided is the commonly used covid-19 safety guideline on construction sites. The study concludes that most of these covid-19 precautions are rarely applied in the study area being investigated.

[Wong et al., \(2020\)](#) investigated anxiety symptoms and the adoption of preventive guidelines against covid-19 in Taiwan. It was found that anxiety and preventive

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3 guidelines scores were increasingly rising in proportionate measure with the pandemic
4 rate. Furthermore, it was revealed that high anxiety was linked with the increased use
5 of preventive protocols against covid-19. The pandemic caught the world uninformed
6 and affected every economic sector, inclusive of the construction industry. The
7 disease caused safety apprehension at workplaces. This is why the world health
8 organisation formulated protocols to be followed to limit the spread of the disease.
9 Most countries adopted, impose, and enforce these guidelines during the covid-19
10 outbreak. These guidelines as reported by [Ezeokoli et al., \(2020\)](#) and [Wong et al.,](#)
11 [\(2020\)](#) to be practiced at all active construction sites during the pandemic to minimise
12 the spread of the diseases include but not limited to:

- 13 a. Social distancing should be practiced.
 - 14 b. Gatherings or crowding at a place should be discouraged.
 - 15 c. If gathering cannot be prevented, suitable personal protective equipment (PPE),
16 should be provided. Provision of PPE should be appropriate for the activity being
17 performed.
 - 18 d. Limit interaction or meeting to the minimum time required to perform the given
19 task and comply to the maximum extent.
 - 20 e. There should be a designated person to enforce covid-19 adherence on the
21 construction site. This person must always be available on the construction site.
 - 22 f. Meeting points and high-risk zones should be mapped out in case of emergency.
 - 23 g. Minimise close contacts to the barest minimum during the delivery/picking up of
24 materials or equipment.
 - 25 h. Workers should be discouraged from using other people work tool and equipment,
26 desks, and offices. If this cannot be ascertained, they should be disinfected before
27 and after use.
 - 28 i. Wash stations or hand sanitisers should be placed in visible areas to all workers
29 the required hygienic practices.
 - 30 j. Frequently touched surfaces and objects should be disinfected regularly.
 - 31 k. Cover the mouth and nose when coughing or sneezing and wash the hand
32 immediately afterwards.
 - 33 l. Cover the mouth and nose with a tissue during coughing or sneezing
 - 34 m. Workers handling task should report about their sickness and stay at home, except
35 for medical attention.
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- n. Employees must inform their boss/superior of any sick member of their family at home with covid-19 symptoms.
- o. Eye protective shield must be worn
- p. Wash hand frequently with soap
- q. Avoid eyes, mouth, and nose touching.
- r. Tissue paper for coughing or sneezing should be disposed of appropriately and immediately after use.
- s. Hand hygiene should be performed after contact with contaminated objects or respiratory discharges.
- t. Self-isolate when you are feeling unwell with covid-19 symptoms.
- u. Declare and seek medical care when having covid-19 symptoms.

[Amoah and Simpeh \(2020\)](#) examine South African construction firms' challenges in implementing COVID-19 safety measures. The study found that lack of compliance, ignorance about covid-19, the supply of substandard protective equipment, improper sanitising of construction materials, workers commute through public transport, difficulty in sharing work tools and equipment, the superstitious belief on Covid-19, and the difficulty in complying with social distancing rules are challenges to the implementation of safety protocols on construction site. [Raliile and Haupt \(2019\)](#) also found that construction site workers must be safety conscious as they have a duty of care to ensure their safety and others'. This justifies a need to investigate construction site worker's compliance with covid-19 protocols on construction sites.

METHODOLOGY

This survey was conducted after the ease of lockdown following the Nigerian first upsurge of the covid-19 pandemic. Activities on many construction sites were shut down due to the pandemic. Hundreds of people were reported to have contracted the disease, with scores of recorded death cases. After the ease of lockdown, construction activities were allowed to return to many sites but with a paradigm shift and protocols to prevent the disease's spread. The survey questionnaires were personally administered with strict compliance to covid-19 protocols to construction workers found on various sites. The information sought was to investigate their knowledge of and compliance with the covid-19 protocol related to construction site activities.

Lagos State, a growing urban centre in the South-Western part of Nigeria, was the study site. The area was selected because it has been established that 75% of construction firms in the country are either based or have branches located there (Ameh & Farinde, 2020). Also, there is a high volume of construction activities concentration and execution therein (Oke et al., 2017). There are twenty (20) Local Government Areas (LGA's) in Lagos State and thirty-seven (37) Local Council Development Areas (LCDAs) with substantial developmental projects recorded to be ongoing daily. Two construction sites were purposively selected in each of the fifty-seven (57) local government areas totalling one hundred and fourteen (114) study sites. Three construction workers were randomly selected as the respondents on each study site. A total of three hundred and forty-two (342) questionnaires were administered to the respondents.

However, due to the site workers' mobility, only two hundred and forty-six (246) questionnaires were retrieved, signifying a 71.93% response rate. On careful consideration of the retrieved questionnaires, only two hundred and twelve (212) representing 86.18% were filled correctly and considered valid for the data analysis. The information provided in the questionnaire comprises questions that bother on the construction site workers awareness about the COVID-19 pandemic, its symptoms, the preventive measures provided on construction sites, and how they respond and comply with safety measures against the pandemic. The data analysis was done using frequency tables, Mean Item Score (MIS), and factor analysis.

Mean item score: This is a quantitative analysis technique used for prioritising the level of significance of the variables. This method, which has been widely used in construction research, was adopted to determine individual construction workers' relative practice in complying with a preventive measure against the covid-19 pandemic on construction sites.

Exploratory Factor analysis (EFA): This is a statistical method otherwise known as a data reduction tool. It is used to detect smaller groups that can denote relationships among the variable set that are interrelated (Liao and Teo, 2017). The technique efficiently reduces/regroup identified factors from a larger size to a smaller size based on the responders' factor scores. It helps remove redundancy from a given set of

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3 correlated variables. It is used in underlying factors identification and variables
4 screening (Chan et al., 2018). EFA is carried out in two steps: factor extraction and
5 rotation of factor. Firstly, one must detect the number of factor groupings in the
6 variables set. Secondly, it ensures that grouping is more interpretable and influences
7 the number of underlying grouping (Adabre and Chan, 2019; Hair et al. 2009).
8 Therefore, the EFA used in this study will unravel the primary grouping between the
9 identified preventive measures.
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18 RESULTS

19 *Profile of respondents*

20 **INSERT TABLE 1 HERE**

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23 Data obtained from the workers at various construction sites across Lagos State, as
24 shown in Table 1, indicate that more males are involved in construction works than
25 females. This, however, is not unexpected as Odesola (2012) has established the
26 dominance of male workers on construction sites. These workers' age distribution
27 shows that 11(5.2%) of the surveyed workers are below 18 years of age, while those
28 between 18-24 are 39(18.4%). The age bracket 25-34 years has 44(20.8%). From the
29 table, 8 (3.8%) construction site workers are above 55 years. Out of all the
30 respondents, only 5 (2.4%) do not have a formal education; 24 (11.3) attained primary
31 education. Most of these workers – 111 (52.4%) have obtained Secondary/Technical
32 College education, while the remaining 72 (34%) have tertiary education.
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42 Data on the role or duty performed by the surveyed construction workers onsite shows
43 that 65 (30.7%) are artisans. These groups include bricklayers, welder, mason, painter,
44 electrician, tilers, carpenters etc, whose jobs require formal training or special skill.
45 Labourers are 126 (59.4%) of the surveyed workers, constituting the majority. These
46 groups provide supports to artisans and do not require particular skills to discharge
47 their job. However, it is believed that the workers are known to provide the necessary
48 reliable data for the study, especially because all the site workers are educated.
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Covid-19 awareness among construction site workers

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Table 2 displays the information on the awareness of the Covid-19 among the construction site workers. It is noteworthy that all of them are not ignorant of the virus. This implies that the knowledge of the pandemic is common among construction site workers. However, only 3(1.4%) have undertaken the covid-19 test among all. This may be because many of them do not have the need to do the test or haven't contracted the virus.

INSERT TABLE 3 HERE

Covid-19 presents many symptoms among its victims, and these symptoms are documented. Government and health workers are spreading information on these symptoms and advising that any person presenting any of them should immediately seek medical help. Table 4 shows the knowledge of the various covid-19 symptoms among the surveyed construction site workers. It is worrisome that many construction workers do not have good knowledge of the covid-19 symptoms, although they claimed to be aware of the coronavirus. Out of the twelve documented symptoms, the surveyed respondents show considerable knowledge of "difficulty breathing" and "shortness of breath"; an indication that until many of them get to the point of having difficulty breathing, they do not believe they have covid-19 but some other ailments. Based on the discussions that ensued between the respondents and researchers during data collection and completion of the survey questionnaire, some construction site workers do not attribute some symptoms such as tiredness and aches pain to covid-19 as these are their typical experiences even before the outbreak of the pandemic.

Provisions for Covid-19 preventive measures on construction sites

INSERT TABLE 4 HERE

Going by the government's various guidelines to forestall the spread of coronavirus, specific preventive measures were advised to be provided in public places. This includes a functional wash hand basin with soap and a sanitiser/handwash provision, among others. Data on the provision/availability of these measures on various surveyed construction sites across the study area indicate that none of the construction

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3 sites has satisfactory response. Most of the respondents answered "No" to the
4 availability and provision of the preventive measure/materials. This implies that many
5 of the construction site owners/supervisors/operators only pay lip service to the fight
6 against the coronavirus. Based on observations, some sites with the inscription of "No
7 Mask, No Entry" policy do not enforce it nor prevail on the construction site workers
8 to use their mask after entry; while some only enforce it on entry. The survey shows
9 that only a handful of construction sites representing 29 (13.7%) check workers'
10 temperature with an infrared thermometer while others do not.
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18 *Construction site workers' compliance with Covid-19 protocol*

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20 Kaiser-Meyer-Olkin (KMO) test was done to examine the sample's adequacy and
21 shows KMO results of 0.678 above the minimum benchmark of 0.50 (Olawumi &
22 Chan, 2019), and connotes a perfect degree of common variance. Since the KMO is
23 closer to 1, it implies that the generated cluster is credible, distinct, and dependable
24 (Chan & Choi, 2015). Similarly, Bartlett's test of sphericity was adopted to ascertain
25 the appropriateness of the Principal Components Analysis for factor extraction. The
26 BTS revealed a significant chi-square value of 932.104 with a significant value of
27 0.00. This depicts that the correlation matrix is not an identity matrix (Chan & Choi,
28 2015). The above tests have shown that the data is suitable for factor analysis. The
29 extraction of the factor using the Principal Components analysis resulted in 4 factors
30 which account for 66.290% of the total variance explained and higher than the
31 benchmark of 60% (Olawumi & Chan, 2019). All the factors were retained as they all
32 have factor loading closer to 1.0; thus, they all significantly contribute to its
33 underlying grouped factor.
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47 **Group 1: Personal protective measures:** This group contains 4 underlying measures
48 that construction site workers could adopt to prevent the spread of covid-19. They are
49 wearing a nose mask, wearing an eye-protective shield, washing hands with soap
50 frequently, avoiding hand touching of the nose, mouth, and eyes. This group has
51 35.560% of variance explained, which represents the highest of the four factor
52 grouping. This connotes that personal protective measure is a crucial and significant
53 measure that construction workers can adopt to reduce the disease rate while working
54 on site.
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Group 2: Good etiquette/manners: This underlying group also has four measures against the spread of Covid-19 on the construction site. They are cover the nose and mouth with a tissue when you cough/sneeze, dispose of the tissue paper used appropriately after coughing/sneezing, washing your hand immediately after coughing or sneezing, and performing hand hygiene after having contact with respiratory secretions or contaminated objects. This underlying group explains 11.709% of the total variance.

Group 3: Contact precautions: This grouped explained 10.342% of the total variance. They comprise two preventive measures that could help limit the spread of covid-19 while working on site. These factors are avoiding close contact with others and avoiding group meeting or gathering

Group 4: Prompt actions: This underlying group contains two measures against the spread of Covid-19 on the construction site. They include social distancing when feeling unwell and surrendering to health officials when one notices the symptoms. These two measures under this group collectively explain 8.680% of the total variance.

INSERT TABLE 6 HERE

This study's main crux is to determine the extent of construction site workers' compliance with Covid-19 protocols. This was achieved by reporting the respondents' disposition to the identified preventive measures and detailed in Table 6. Overall, wearing a nose mask ranks 1st with MIS 3.47. This appears to be the most popular and observed covid-19 protocol among the site workers. The preventive measure in 2nd rank (position) is to perform hand hygiene, as evident with MIS 3.30. This should be done when you come in contact with respiratory discharges or polluted objects. Frequent washing of hands with soap ranked 3rd with MIS 3.10. Wearing an eye-protective shield ranked 4th with 3.00 MIS. Avoiding eye, nose, and mouth touching ranked 10th with 2.24 MIS. It is widely publicised that the virus accesses humans through these outlets; however, it is noticeable that construction site workers in the study area pay less attention to these all-important covid-19 preventive measures. Hence the reason for its lowly ranked position.

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5 Next to this is maintaining physical/social distancing when feeling unwell ranked 11th
6 with 1.70 MIS. This implies that these construction site worker does not see the need
7 to self-quarantine even when feeling ill. This may be attributable to the fact that most
8 industry workers might not be paid for a job not done (Laing, 2020), especially when
9 most of them are daily paid workers. Another fact is that they may not believe that
10 their ailment could be associated with Covid-19. Thus, they still manage to mix with
11 other workers by going for site work even when they feel unwell. This could endanger
12 their colleagues and the public. The lowest ranked is prompt reporting oneself to the
13 authority/healthcare providers with 1.69 (MIS) and 12th position. The lack of
14 willingness to report oneself may be an avoidance of social stigmatisation that may
15 accompany contracting the virus. This study agrees with the investigations of
16 Amoah and Simpeh (2020) and Simpeh and Amoah (2021) that non-compliance to
17 covid-19 safety guidelines could increase exposure to the virus. Also, the Nigerian
18 government's stay-at-home policy posed a significant dilemma to the construction
19 sector since most workers in this sector cannot work from home.
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32 **CONCLUSION AND RECOMMENDATION**

33 This article has investigated the compliance of construction site workers with
34 preventive measures geared towards curbing the spread of Covid-19 pandemic. The
35 blatant disregard for the protocols suggested by the World Health Organisation could
36 lead to the rising spread of the pandemic among people, inclusive of the site workers,
37 and then transmitted to the public. This may spell doom for the compromise of public
38 health if not quickly and urgently checked. It is also apparent that there is a high level
39 of ignorance among the construction site workers concerning the symptoms of
40 Covid-19, despite their claim to be aware of the pandemic.
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50 Based on this study's findings, it is recommended that an intensive awareness
51 campaign backed with public enlightenment should be regularly carried out to educate
52 people, construction workers inclusive, about how covid-19 and its associated
53 symptoms could impact people's health. The necessity is to seek medical help when
54 the need arises. The State government needs to develop specific and stringent
55 covid-19 policy and operational guidelines for every construction site and ensure
56 strict compliance with preventive measures to combat the spread of these deadly
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diseases. Sanctions to errant ones or organisations could accompany this. Conclusively, it is sufficient to inform that the fight against covid-19 is a fight for life, and nothing should be spared to ensure a win in this battle.

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Table 1: Demographics of respondents

Background information	Response	Frequency	Percentage
Sex of Respondent	Male	158	74.5
	Female	54	25.5
	Total	212	100.0
Age of Respondent	Below 18 years	11	5.2
	18 - 24 years	39	18.4
	25 -29 years	44	20.8
	30 - 34 years	30	14.2
	35 - 39 year	16	7.5
	40 - 45 years	20	9.4
	46 - 49 years	34	16.0
	50 - 55 years	10	4.7
	above 55 years	8	3.8
	Total	212	100.0
Highest level of education	No formal education	5	2.4
	Primary education	24	11.3
	Secondary/Technical College	111	52.4
	Tertiary Education	72	34.0
	Total	212	100.0
Site worker role	Artisans	65	30.7
	Labour	126	59.4
	Supervisor/Engineer	21	9.9
	Total	212	100.0

Table 2: Awareness and undertaken of Covid-19 test

S/N	Response	Frequency	Percent
1	Aware	212	100.0
	Not Aware	0	0
	Total	212	100.0
2	Yes	209	98.6
	No	3	1.4
	Total	212	100.0

Table 3: Awareness of Covid-19 symptoms

S/N	Status	Response	Frequency	Percent
1	Fever	Aware	81	38.2
		Not Aware	131	61.8
		Total	212	100.0
2	Dry Cough	Aware	37	17.5
		Not Aware	175	82.5
		Total	212	100.0
3	Tiredness	Aware	64	30.2

		Not Aware	148	69.8
		Total	212	100.0
		Aware	85	40.1
4	Aches Pain	Not Aware	127	59.9
		Total	212	100.0
		Aware	92	43.4
5	Sore Throat	Not Aware	120	56.6
		Total	212	100.0
		Aware	88	41.5
6	Diarrhoea	Not Aware	124	58.5
		Total	212	100.0
		Aware	73	34.4
7	Conjunctivitis	Not Aware	139	65.6
		Total	212	100.0
		Aware	49	23.1
8	Headache	Not Aware	163	76.9
		Total	212	100.0
		Aware	85	40.1
9	Loss of Taste Smell	Not Aware	127	59.9
		Total	212	100.0
		Aware	21	9.9
10	Skin Rash and Dis-colouration	Not Aware	191	90.1
		Total	212	100.0
		Aware	199	93.9
11	Difficulty breathing	Not Aware	13	6.1
		Total	212	100.0
		Aware	181	85.4
12	Shortness of breath	Not Aware	31	14.6
		Total	212	100.0
		Aware	66	31.1
13	Loss of speech or movement	Not Aware	146	68.9
		Total	212	100.0

Table 4: Availability of Covid-19 preventive measures

Preventive measures availability onsite	Response	Freq	Percentage
Mounting of wash-hand basins at strategic places	Yes	56	26.4
	No	156	73.6
	Total	212	100.0
Provision of hand sanitiser	Yes	86	40.6
	No	126	59.4
	Total	212	100.0
Provision of soap/hand-wash	Yes	96	45.3
	No	116	54.7
	Total	212	100.0
No site entry without nose mask policy	Yes	80	37.7
	No	132	62.3
	Total	212	100.0
Use of infrared thermometer for	Yes	29	13.7

temperature check	No	183	86.3
	Total	212	100.0

Table 5: Cluster grouping of the preventive measures against Covid-19 by construction workers

Factors	Factor loading	Factor groupings	Eigen value	Variance
Wearing a nose mask	.692	Personal protection measures	4.267	35.560
Wearing an eye-protective shield	.724			
Wash your hand with soap frequently	.713			
Avoid hand touching of your nose, mouth, and eyes	.697			
Covering the nose and mouth with a tissue when you cough/sneeze	.518	Good etiquette/manners	1.405	11.709
Dispose appropriately the tissue paper after coughing/sneezing	.607			
Wash your hand immediately after coughing/sneezing	.730			
Perform hand hygiene	.603	Contact precautions	1.241	10.342
Avoid close contact with others	.636			
Avoid group meeting	.575	Prompt actions	1.042	8.680
Social distancing when feeling unwell	.707			
Surrender to health officials when on notice the symptoms	.656			
Total Variance				66.290
KMO				.678
Bartlett's Test of Sphericity Approx Chi-Square				932.104
Sig.				0.00

Table 6: Compliance of construction workers with Covid-19 protocol

Preventive measures	Std. Dev	Mean	Rank
Wearing a nose mask	1.133	3.47	1
Perform hand hygiene	1.094	3.30	2
Wash your hand with soap frequently	1.030	3.10	3
Wearing an eye-protective shield	0.978	3.00	4
Dispose of the tissue paper appropriately after coughing/sneezing	0.976	2.90	5
Wash your hand immediately after coughing/sneezing	0.861	2.81	6
Covering with a tissue the mouth and nose when coughing/sneezing	1.319	2.69	7
Avoid coming closer with others	1.136	2.56	8
Avoid group meeting	1.252	2.46	9
Avoid hand touching of your nose, mouth, and eyes	0.877	2.24	10
Social distancing when feeling unwell	0.945	1.70	11
Surrender to health officials when on notice the symptoms	0.938	1.69	12