

**SOCIOLOGICAL ANALYSIS OF COVID-19 KNOWLEDGE, ATTITUDE, COMPLIANCE AND SUSTAINABLE DEVELOPMENT GOALS (SDGS) IN NIGERIA: DATA SCREENING AND PRELIMINARY ANALYSIS**

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**ABSTRACT:** *COVID-19 has spread with frightening speed, affecting millions of people globally. In reaction to the fight against Covid-19, Nigeria's government has witnessed lockdown on some significant social and economic activities. However, the lockdown has been less effective in controlling the spread of the disease, perhaps due to negative attitude, low level of Knowledge, and poor compliance to prevention and control measures among the populace, which invariably resulted in a destructive spill-over effect on the realization of sustainable development goals (SDGs). Therefore, this study's objective was to conduct data screening and preliminary analysis of the selected sociological study's constructs. This study used a cross-sectional survey design and a web-based questionnaire and collected 312 productive questionnaires. The data was screened and cleaned to satisfy the underlying assumptions of multivariate analysis. Specifically, this study conducted data screening by examining response rates, missing values, outliers, normality, multicollinearity, and non-response bias. The result of the study indicated that the dataset had satisfied all the requirements for further multivariate analysis.*

**KEYWORDS:** sociological analysis, data screening, sustainable development goals, knowledge, attitude, compliance

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## **INTRODUCTION**

Data screening is an essential aspect of any multivariate analysis, laying the foundation for the quantitative study (Hair, Hult, Ringle & Sarstedt, 2014 & Gorondutse & Hilman, 2014 & Babagana, Mat & Ibrahim 2019). Specifically, the screening of data is a noteworthy stage for reflection among investigators in the discipline of social sciences and other sciences (Abdulwahab, Zulkhairi & Galadima 2011 & Hair et al. 2014). It is imperative to identify any possible violation of the underlying multivariate analysis assumptions via data screening (Hair et al. 2014 & Yusuf, Chea, & Rabiul (2019). Consequently, the consistency of the study results and acceptability depends on data

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screening; researchers often miss this crucial analysis stage because of its burden (Abdulkadir, Zabedah, & Aidi 2017, Badara & Zabedah 2014). The lack of data screening frequently leads to poor reliability of the tests and precision of the method of analysis (Gorondutse & Hilman, 2014).

Although Hair et al. (2014) and Tabachnick and Fidell (2013) argued that data screening could be carried out by proofreading the original data from the computer file, which applies to a small set of data only, however, when the data is broad, proofreading the data on a computer is cumbersome. Therefore, it is essential to analyze the data using computer software for concise statistics. Computer software such as SPSS and smartPLS reveal secret errors that could not be found by proofreading (Hair Jr. et al., 2014 & Abdulkadir et al. 2017). Also, the data screening technique increases the researcher's Knowledge of the interaction between the variables (Hair et al. 2014). Thus, it is noted that studies' strength to make meaningful inferences primarily lies in the researchers' ability to conduct a thorough and meaningful data screening and preliminary analysis (Badara & Zabedah 2014 & Shehu & Mahmood 2014).

Thus, the data screening method enables unambiguous interpretation of the study's result and satisfies the principles of multivariate data analysis (Hair Jr. et al., 2014 & Abdulkadir et al. 2017). Consequently, based on Hair et al. (2014) 's recommendation on the need to conduct data screening and preliminary analysis, this study examined response rate, missing values, outliers, normality, multicollinearity, and non-response bias.

### **Problem Statement**

The novel Covid-19 has virtually affected all facets of life in Nigeria, just like the rest of the world (Muhammad, Suliman, Abeer, Nadia, & Rabeea 2020 & NCDC, 2020). Sequel to the disease pandemic, Nigeria's government has witnessed shutdowns on some significant activities such as flight, worship centers, schools, markets, and recreational facilities (WHO, 2020a). The effect of the lockdown intended to curtail the spread of corona virus has not been too impressive, perhaps, due to lack of palliative measures to cushion the hardship as a result of the non-movement of people; the negative attitude of the communities towards the disease; low level of Knowledge among people, poor compliance with prevention and control measures among others, which could invariably thwart sustainable development (WHO, 2020a & World Bank, 2020).

Furthermore, the World Bank (2020) article indicated that Corona virus disease has spread with frightening speed, affecting millions of people globally. The virus's effect has brought activities in all aspects of existence to a near halt due to strict measures on movement to control the disease spread. The above organization adds that with the increasing rate of disease and death due to Covid-19 around the globe, it will cause destructive spill-over effects on the health, economy, and other facets of the life of the society. The pandemic and the long-term destructive effect the disease has on growth and development would be enormous (World Bank, 2020). Economically, despite the government's efforts to address recessions with fiscal and monetary policy provisions, there is a 5.2 % contraction in the global gross domestic product (GDP) in 2020, which

is the deepest global recession in many years. Precisely, developed economies are estimated to contract by way of 7 percent. The other weakness might spill over to the developing economies, including Nigeria, which is estimated to contract by way of 2.5 % as they handle their home virus outbreaks (World Bank, 2020).

Similarly, each region is prone to considerable downwards growth. For example, East Asia and the Pacific are estimated to grow by way of 0.5 %. South Asia will contract by way of 2.7%, Sub-Saharan Africa by way of 2.8%, Middle East, and North Africa by way of 4.2%, Europe and Central Asia by way of 4.7%, and Latin America by way of 7.2%. The preceding downwards trends are anticipated to reverse centuries' efforts towards sustainable development goals and push millions of individuals back into extreme poverty (World Bank, 2020). Equally, as time goes by, the profound recession caused by the pandemic could expose nations to lower investments, unemployment, poor education, inequality, worsening health due to shortage of supply of facilities, especially among developing nations such as Nigeria.

Health-wise, the Director-General of the World Health Organization, Dr Tedros Ghebreyesus, stated that several people who require treatment for cancer, diabetes, and cardiovascular disease have not been receiving health services and drugs they want since the outbreak of COVID-19 began (WHO, 2020a). In the same vein, the report in the countries surveyed including Nigeria indicated that services disruption are widespread, for example, 53% of services for hypertension treatment, 49% treatment for Diabetes-related complications, 42% for cancer treatment and 31% for cardiovascular diseases treatment and 63% of rehabilitation services were all disrupted (WHO, 2020a). According to Dr Tedros, perhaps the failure to hold back the spread of Covid-19 disease and by extension boost the attainment of sustainable development among the communities of emerging economies could be because of the People's lukewarm attitude, poor Knowledge of the citizens concerning the infection and the inability of most citizens of developing societies to comply with Covid-19 prevention and control measures (Muhammad et al. 2020, WHO, 2020a, 2020b & 2020c). The issues above emphasize the need for immediate action to lessen the pandemic's health, economic, and social effects and set the path for attaining sustainable development (World Bank, 2020).

Several studies (Hassan, Haridi, Abdalmohsen, & Moazzy 2016; Ghada et al. 2019; Bao-Liang, Wei, Hai-Mei, Qian-Qian, Xiao-Ge, Wen-Tian, & Yi 2020; Erfani et al. 2020, John, 2020; & Samea, Mahjabeen, Khizra, Tanveer, Noor-ul, & Muhammad, 2020, WHO, 2020a, 2020b & 2020c) have examined the relationships between Knowledge, attitude, compliance with prevention and control measures against infectious diseases and sustainable development. For instance, in the works of Hassan et al. 2016 and Ghada et al. 2019 on knowledge attitude and compliance, the results indicated that good Knowledge and positive attitude have a profound influence on compliance to the utilization of disease prevention and control measures and consequent growth and development in the Kingdom of Saudi Arabia. Also, in the work of John (2020) entitled 'Knowledge and behaviors toward COVID-19 among U.S. the study observed that organized effort at pandemic response might ensure better compliance with behavioral commendations to address the challenges posed by the disease, thereby fostering

sustained development. Similarly, in the work of Boa-Liang et al. (2020) on Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the disease outbreak: a quick online cross-sectional survey, the result of the study indicated that majority of Chinese populations of a relatively high socioeconomic standing, especially women, have the Knowledge about COVID-19, embrace positive attitudes, and have appropriate practices towards the disease. Also, in the work of Samea et al. (2020), 'is Pakistan prepared for the COVID-19 epidemic: a questionnaire-based survey, their finding shows that healthcare providers and literates groups in the Pakistani society are not prepared for the disease outbreak, which has spill-over effects on growth and development. Moreover, the WHO (2020d & 2020b) stated that what the organization experienced from the previous outbreak of severe acute respiratory syndrome (SARS) in 2003 demonstrated that Knowledge, attitudes, and compliance towards infectious diseases are related to the level of anxiety and sentiment among the population, which invariably affects the level of growth and development within societies. Therefore, the previous studies have provided insight into the importance of Knowledge, attitude, and practice in influencing sustainable development goals.

Data screening for health problems, such as Covid-19, is one of the most significant steps in amassing recognition of the issue and offering healthier management (Hair et al. 2014 & WHO, 2020d). Data screening and preliminary studies apparatuses have been extensively used in social and business researches but are not frequently used in health studies (Muhammad, 2020). There are few published studies on data screening and preliminary studies relating to Covid-19 Knowledge, attitude, compliance, and sustainable development goals. In fact, to the Knowledge of these researchers, there is no single Covid-19 study that conducts data screening and preliminary analysis in Nigeria.

Therefore, this study conducted data screening to ensure that the study constructs are reliable and error-free and acceptable for further analysis. Specifically, this study undertook data screening and preliminary analysis regarding the relationships between Covid-19 Knowledge, attitude, compliance, and attainment of SDGs in Nigeria. The screened data would significantly improve health and social studies' conduct by extension realization of SDGs in Nigeria.

## LITERATURE REVIEW

COVID-19 is an emerging respiratory infection caused by a corona virus (John, 2020 & Rahul et al., 2020). The Covid-19 disease is an exceptionally infectious one leading to fever, weariness, dry cough, muscle pain, laboured breathing, acute respiratory distress, and blood-related disease (John, 2020 & Rahul et al. 2020). Also, according to Li et al. (2020), Corona virus disease is an infectious disease caused by a newly discovered corona virus in which the people affected experienced mild to moderate features and may even recover without distinct treatment.

In conducting scientific studies of quantitative nature, it is crucial to start by undertaking a preliminary analysis and data screening of the variables before further

multivariate analysis (Hair et al. 2014). Therefore, the variables that this study explored include sustainable development goals, Knowledge, attitude, and compliance.

Sustainable development goals (SDGs) is an essential construct to the wellbeing of humanity, which refers to the global call to actions or targets aimed at improving the livelihood of individuals' world over by 2030 through 17 SDGs goals (Roa, Jumbam, Makasa, & Meara, 2018 & UNSDG, 2017). Also, the United Nations Sustainable Development Goals (UNSDG, 2017) highlighted that SDGs are the new global targets for improving people's lives. At the United Nations Summit on September 2, 2015, world leaders adopted the Agenda for Sustainable Development, which includes a set of 17 Sustainable Development Goals (SDGs) to end poverty, fight inequality and injustice and tackle climate change 2030. The SDGs are built on the Millennium Development Goals MDGs (UNDP, 2020). The SDGs are relevant because they are robust engagement platforms that support the application and monitoring of the United Nations treaty on the rights of individuals with infirmity (UNDP, 2020).

Knowledge concerning COVID-10is a critical concept in evaluating the success or otherwise of SDGs. Knowledge is the awareness of the happenings within the immediate environments of individuals (Kassahun & Mekonen, 2017). The acquisition of Knowledge is indispensable towards the realization of sustainable development goals (SDGs) because the information is power (WHO, 2020b). Adequate information allows people to distinguish between factual and inaccurate phenomena and the consequences of inaction to factual events (Ghadaet al. (2019).In this case, individuals with factual information about Covid-19 are at an advantage of utilizing health and other social services to curtail the disease (Ghada et al. 2019). Several studies (Kassahun et al. 2017 & WHO, 2020d) have examined the relationship between Knowledge and sustainable development. For example, Kassahun et al. (2017) and WHO (2020d) found a positive relationship between people's level of Knowledge and sustainable development.

Attitude is another imperative construct for sustainable development. Attitude refers to the beliefs about particular behaviour weigh by the assessment of such beliefs (Muhammad, 2018). Hassan et al. (2016) and Muhammad (2018) argues that specific behaviour's performance is based on an assessment of the benefits or otherwise of such beliefs. Concerning this study, it can be inferred that the perceived benefits of maintaining a healthy life, an aspect SDGs, encourages individuals in the respective communities to comply with Covid-19 preventive and control measures. Several studies (Guan, Meng, Liu, and Xue 2019 & UNDP, 2020) have examined the relationship between attitude and SDGs. For example, Guan et al. (2019) found that the public's personal beliefs have a significant impact on their attitudes toward sustainable development and that health, economic, and socially conscious people are more likely to hold a positive attitude towards sustainable development goals.

Compliance is an additional central construct that influences SDGs. Compliance is a state of existence in agreement with recognized rules or guidelines (Ghada et al. 2019). Also, compliance refers to making sure that people conform to government legislation and business regulations (Hassan et al. 2016). Therefore, about this study, compliance implies conformity with established Covid-19 prevention and control guidelines among

Nigeria's citizens. The essence of compliance with Covid-19 measures is to prevent and control the spread of the disease; invariably, making citizens live a healthy lifestyle (UNDP, 2020). Several studies (Hassan et al. 2016 & UNDP, 2020) have examined the relationship between compliance and sustainable development goals. For example, the UNDP (2020) has established a positive association between compliance with health agencies' regulations against Covid-19 and sustainable development.

Despite the previous studies' contributions, they have created gaps in Knowledge that need to be filled. For example, the majority of the earlier studies concerning the variables of interest were conducted in the USA, Taiwan, China, Saudi Arabia, the US, India, Pakistan, Taiwan, and Iran. Thus, the above situation provided a contextual gap, implying that the studies were conducted in different areas from those of Nigeria socioeconomically, culturally, and politically. Furthermore, most previous studies were bedevilled by methodological flaws. The flaws include the failure of previous studies to indicate if they have screened their data for possible errors. Therefore, the scenarios above-created gaps for this researcher to carry out an additional study by undertaking data screening and preliminary analysis on the constructs of interest to this study.

## **METHODS AND MATERIALS**

This study primarily conducted data screening and preliminary analysis in order to satisfy the assumptions of multivariate analysis, which focuses on ensuring reliability, acceptability, and error-free data as well as unambiguous interpretation of results; in line with the recommendation of Hair et al. (2014) Muhammad & Nuarrual Hilal, (2020) and Muhammad & Nuarrual Hilal, (2021). Thus, this study used a descriptive cross-sectional survey research design to explore the perceived relationship between Knowledge, attitude, compliance of residents of Nigeria with Covid-19 prevention and control measures, and how such variables influence the achievement of sustainable development goals in Nigeria.

This study gathered data using a web-based survey questionnaire through the researchers' online Facebook accounts from 8<sup>th</sup> April to 22<sup>nd</sup> of June 2020, when only a few states in Nigeria were under lockdown. Within two weeks of the posting of the questionnaire online, the response rate hit 342 marks. Consequently, the filled questionnaires were retrieved by downloading the responses in excel format. Using the researchers' timeline on Facebook link, the prospective respondents can necessarily access the questionnaire by clicking on the link provided to answer the survey questions. The study questionnaire has demographic variables and 37 items adapted from the works of Erfani et al. (2020), Samea et al. (2020), Bao et al. (2020), John (2020), UNDP (2020), UNSDG (2017) and World Bank (2020) and Muhammad & Nuarrual Hilal, (2020). The study questions include those on basic Knowledge on Covid-19 disease, individual attitude, compliance with Covid-19 prevention and control, and SDGs. Consequently, the study questionnaires were coded and run for data screening and preliminary analysis using SPSS.

The explanation for using a web-based questionnaire is that it provides a higher response rate because the responses are gathered immediately the respondents filled in

the answer chosen by clicking the buttons, which is in line with the views of Rahul and Gopi (2020). Also, because of added supports provided by questionnaires over other instruments, including ease of coding, graphs, tabularization, as well as assist respondents in making a quick choice which is more comfortable for the researcher to code for onward analysis; this provides further justification why the study used a questionnaire.

The questionnaire items were measured by five Likert scales based on Sekaran and Bougie (2013) Muhammad, Adamu, Abubakar, Suleman, & Salisu, (2021) and Muhammad, Danjuma, Abubakar, Salisu, & Suleman, (2021). Of the 342 questionnaires filled by the study respondents, only 312 questionnaires were usable, while 30 were removed because they were not filled correctly. Therefore, only 312 questionnaires were used for data screening and preliminary analysis. Also, six negative worded questions were reversed coded including K4, A2, A3, SDGs1, SDGs1, and SDGs12.

## RESULTS AND DISCUSSIONS

### Demographic Characteristics of the Respondents

The statistical analysis indicated that the majority of the study's respondents, 217 (69.6%), are within the age range 20-44, while the least respondents 35 (11.2) are within the age range 15-29. Also, the result in Table one indicated that the highest number of study respondents, 277 (88.8%) are male, while the least 35 (11.2%) are female. The preliminary result is similar to the distribution observed in previous studies (NCDC, 2020). Also, 179 (57.3%) respondents are the majority concerning the highest educational level with a first degree or equivalent. At the same time, the least 66 (21.2%) possessed postgraduate degrees.

Table 1: Demographic Characteristics of the Respondents

Variable	Category	Frequency	Percentage
Age	15-29 years	35	11.2
	20-44 years	217	69.6
	45 years above	60	19.2
Gender	Male	277	88.8
	Female	35	11.2
Educational Level	Diploma/NCE or Equivalent	67	21.5
	BSc/HND or Equivalent	179	57.3
	Postgraduate	66	21.2
Employment status	Employed	259	83.0
	Unemployed	53	17.0
Monthly Income	Below N20000	61	19.6
	N20000-50000	184	59.0
	N50000 above	67	21.5
Palliative Measures	Yes	285	91.3
	No	27	8.7
Sources of Water	Yes	294	94.2

	No	18	5.8
Health Services	Yes	276	88.5
	No	36	11.5
Qualitative Education	Yes	285	91.3
	No	27	8.7
Transportation	Yes	310	99.4
	No	2	.6
Gender Equality	Yes	267	85.6
	No	45	14.4
Electricity Supply	Yes	309	99.0
	No	3	1.0
Housing	Yes	258	82.7
	No	54	17.3
Peace and Justice	Yes	310	99.4
	No	2	.6

Also, concerning the respondents' employment status, the highest numbers in sample 259 (83.0%) are employed, while the least 53 (17.0) respondents are unemployed. The preliminary result is similar to the findings of Rahul et al. (2020). Regarding the respondents' monthly income, the result indicated that a higher percentage of the respondents 184 (59.0%) generated an income between N20000-50000 (approximately USD 50-125) per month. In contrast, the least 61 (19.6) respondents generated a monthly income below N20000 (less than USD 50). The preliminary result shows that most of the respondents live above 1.25 dollars, which is above the target of UNSDG (2017) and World Bank (2020).

Furthermore, concerning respondents' perceptions of the role of palliatives in dampening the effects of Covid-19, by extension boosting sustainable development goals, majority 285 (91.3%) of the respondents affirmed the critical role of palliatives as indicated in Table 1. While the least 27 (8.7%) respondents disagree, opining that the Nigerian government's palliatives are insignificant in cushioning the effect of Covid-19. The above result concerning majority views is similar to the opinion of the WHO (2020a). Also, 294 (94.2%) respondents are the majority who agree that excellent sources of water supply prevent and control Covid-19, invariably, increasing the realization of sustainable development goals. In contrast, the least 18 (5.8%) respondents disagree.

Also, 276 (88.5) respondents are the highest who believe efficient, accessible and affordable healthcare services in their communities is key to preventing Covid-19 as well as ensuring the attainment of sustainable development goals in Nigeria. In contrast, the least, 36 (11.5) disagree. Besides, 285 (91.3%), 310 (99.4%), and 267 (85.6%) respondents respectively, are the majority who opined that qualitative education, excellent transportation, and gender equality are instrumental to prevention and control of corona virus disease, thus ensure the realization of sustainable development goals. In contrast, the least respondents, 27 (8.7%), 2 (0.6%), and 45 (14.4%) respectively, are in disagreement with the other views.

Moreover, 309 (99.0%), 258 (82.7%), and 310 (99.4%) of respondents respectively are the majority who stated that adequate power supply, housing as well as peace and justice are significant to the prevention and control of Covid-19 disease, by extension helps in the attainment of sustainable development goals. While the least respondents, 5 (1.0%), 54 (17.3%), and 2 (0.6%) respectively, are in discrepancy with the other views.

Consequently, based on the respondents' demographic variables, this study inferred that respondents have the crucial information essential for accomplishing the study's objectives. The information is apparent from the information that was presented in Table 1.

### **Response Rate**

Earlier, this study indicated that 342 web-based questionnaires were collected, and 312 were productive. The response rate of this study translated into 91.2%. The other result implies that 30 questionnaires were not filled correctly; thus, they were finally removed from further data screening and preliminary analysis. Consequently, the valid response rate of this study was still 91.2%. Therefore, the above response rate is adequate for the conduct of this study based on the recommendation of Hair et al. (2014). They argued that a 30% response rate is acceptable for further analysis.

### **Missing Value**

In a survey, missing value is experienced when the Study respondents fail to answer some questions (Hair et al. 2014). Missing values and clear answers create problems in data analysis (Hair et al. 2014). Therefore, the researcher is always expected to identify and replace missing values were essential (Hair et al. 2014). In the dataset coded and entered into SPSS by these researchers, four were missed randomly from the 11,544 data points, which explain 0.034 percent missing values. Specifically, the constructs of Knowledge had one missing value, the attitude had three missing values, compliance had 0 missing values, and sustainable development goals had 0 missing values.

Even though there is not a precise percentage of missing values that are tolerable in a data set for making valid statistical inferences, but researchers are all agreed that in a dataset, missing values that reach the rate of 5% or less needs to be replaced (Tabachnick et al. 2013). Researchers have also suggested that mean substitution is the easiest way to replace missing values (Tabachnick et al. 2013). Hair et al.(2014), for example, recommended that a researcher should substitute the missing entries through the mean replacement if the values are less than 5% missing values to each item. Therefore, these researchers replaced four missing values through mean substitution.

Table 2: Total and Percentage of Missing Values

Variable	Number of Missing Values
Knowledge	1
Attitude	3
Compliance	0
SDGs	0
Total number of missing values	4 out of 11, 544 data points
Percentage	0.034%

Note: Percentage of missing values were obtained by dividing the total number of missing values for the whole data by the total number of data points multiplied by 100

### Assessment of Outliers

Outliers denote to the observations, which are inconsistent with the remaining data (Hair et al. 2014). In data analysis, outliers' presence can immensely lead to the misrepresentations of estimates, consequently creating a result that is not reliable (Hair et al. 2014). To detect observations that could be outside the SPSS value labels due to incorrect data entry, firstly, these researchers displayed frequency tables for all the variables via a minimum and maximum statistics. Therefore, based on the preliminary analysis of frequency statistics, no value was outside the expected range.

Also, apart from the use of minimum and maximum statistics, data were examined for the existence of univariate outliers via the standardized value criterion with a cut-off mark of  $\pm 3.29$  ( $p < .01$ ), in line with the opinions of Tabachnick et al. (2013). Therefore, using the preceding criterion, no case of univariate outliers was found from the dataset, and the final datasets were 312. Apart from checking univariate outliers through standardized values, this study also checked for multivariate outliers, using Mahalanobis distance (D2). According to Tabachnick et al. (2013), Mahalanobis distance (D2) is the distance of an item from the centroid of the remaining items, in which the centroid is the point formed by the intersection of means of all the variables on the dataset (Tabachnick et al. 2013). From the  $37-1=36$  observed items of this study's variables, the suggested threshold of chi-square is 51.00 ( $p=0.05$ ). Therefore, in this study, no Mahalanobis value exceeds the threshold of 51.00 because the highest was 15.30. Based on the preliminary result of Mahalanobis D2, no outlier was noticed from the dataset. Thus, the final data used for further analysis was 312.

### Normality Test

Normality is the distribution of data of a study towards a specific variable and its conformity to a normal distribution (Hair et al., 2014). Recently, Hair et al. (2014) suggested that researchers undertaking quantitative studies should conduct a normality test on their data because a highly skewed or kurtotic dataset can influence bootstrapping. By causing it to inflate bootstrapped standard error estimate, by implication, this underestimates the significance of path coefficients (Hair et al. 2014).

Fundamentally, there are two techniques for assessing normality, namely: statistical and graphical techniques. Precisely, to establish normality of the data in this study, skewness, and kurtosis statistics were used (Hair et al., 2014). Although, when the study sample is more significant than 200, such as the current study with 342 samples, the

deviation from the normality of skewness and kurtosis occasionally may not show a fundamental change in the analysis (Tabachnick et al. 2013). Also, Hair et al.(2014) contended that the absolute value of skewness is more than two, and kurtosis value more significant than seven could indicate a problem. Therefore, preliminary analysis of normality carried out for the entire items used in this study shows that the absolute value for skewness is less than 1.60, and kurtosis is 4.29, signifying both are within the accepted range of <2 and <7 respectively.

### Multicollinearity Test

Multicollinearity is a condition whereby one or more independent variables are highly correlated (Hair et al. 2014). The absence of multicollinearity is a necessary assumption of multiple regressions. Assessment of multicollinearity is one of the preliminary analyses supposed to be conducted in regression analysis. However, in statistical analysis, independent variables are expected to be correlated with their matching dependent variable (Hair et al., 2014). However, when one independent variable is highly correlated with one or several other independent variables, at that moment, multicollinearity occurs (Hair, 2014).

The existence of multicollinearity among exogenous latent constructs can significantly misrepresent the result of regression coefficients and their significance test (Hair et al. 2014). Specifically, multicollinearity raises the coefficient's standard errors, invariably, causing the coefficients to become statistically insignificant (Tabachnick et al. 2013). In order to recognize multicollinearity, this study used two methods. In the first method, the correlation matrix of exogenous latent constructs was assessed. Based on Hair *et al.* (2014) estimation, when correlation coefficients reach 0.90 and above, it indicates multicollinearity between the constructs. Table 3 indicated the correlation matrix of the exogenous latent constructs used in the present study. The correlation among the exogenous latent constructs was sufficiently below the threshold values of 0.90, which implies that the entire constructs are independent and not very correlated.

Table 3: Correlation Matrix of the Exogenous Latent Construct

	Construct	Knowledge	Attitude	Compliance
1	Knowledge	1		
2	Attitude	.16	1	
3	Compliance	.39	.62	1

In the second technique of multicollinearity analysis, tolerance and VIF were also taken into consideration. Hair et al. (2014) suggested that multicollinearity is problematic if the value of VIF is more significant than five, while tolerance values become less than 0.20. Conversely, Pallant (2010) suggested that tolerance values less than 0.10, and VIF values above ten show high collinearity. Therefore, the result in Table 4 indicated that there is no multicollinearity among the exogenous latent construct because the result of this study shows the tolerance values ranged between 0.965 to 0.989; considerably higher than 0.1(for tolerance), and the VIF ranges from 1.011 to 1.036 considerably less than 10.

Table 4: Multicollinearity Test based on Tolerance and Variance Inflated Factor (VIF)

Exogenous variable	Tolerance	VIF
Knowledge	.973	1.028
Attitude	.965	1.036
Compliance	.989	1.011

### Non-Response Bias

Non-response bias is the difference gotten in answers between respondents and non-respondents (Hair et al. 2014). To evaluate the probability of non-response bias, a time-trend estimation approach is required that compares the early and the late respondents, i.e., non-respondents (Sekaran et al. 2013). Considerably, late respondents have similar characteristics as non-respondents (Hair et al. 2014). Thus, to decrease non-response bias, at least a response rate of 50% needs to be achieved (Hair et al. 2014).

Based on the suggestions of Sekaran et al. (2013), the researchers divided the respondents into two groups, namely: those that responded within the first four weeks period (early respondents) and those that responded after four weeks (late respondents). Table 5 indicated that 260 respondents (83.3%) who are the majority in the sample responded to the questionnaire within four weeks, while 52 respondents (16.7%) who are the least responded over the next four weeks.

Precisely, this study carried out an independent sample t-test to determine the potentials of non-response bias. In particular, an independent samples t-test was carried out to detect non-response bias in the primary constructs of interest, namely, Knowledge, attitude, compliance, and sustainable development goals. Table 5 below offered the results of independent-samples t-test gotten from the present study.

Table 5: Group Descriptive Statistics for Early and Late Respondents

Construct	Group	N	Mean	SD	Levine's Test for Equality of Variance	
					F	Sig.
Knowledge	Early	260	-.638	1.51	2.36	.125
	Late	52	-.692	1.29		
Attitude	Early	260	-.493	1.302	.169	.681
	Late	52	-.926	1.20		
Compliance	Early	260	.461	1.34	1.24	.252
	Late	52	-.173	.733		
SDGs	Early	260	.457	1.39	1.23	.267
	Late	52	1.03	1.15		

Table 5 above shows that non-response bias is not an issue since the study's expected equal variance level of significance of the variables is higher than 0.05 as the endorsed level of significance in Levine's test of equality of variance (Hair et al. 2014). Also, from the recommendation of Hair et al. (2014) that the minimum response rate in a

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study should be at least 50%, and since this study achieved a valid response rate of 91.2%, therefore, in this study non-response bias is not a significant concern.

## CONCLUSION AND RECOMMENDATIONS

The above-mentioned preliminary analysis findings confirmed that the respondents have vital information about this study's demographic variables. More importantly, the study shows that the four missing values detected in the data set were replaced through mean substitution. Specifically, it is critical to realize that mean substitution is suitable for replacing missing values in a dataset with 5% or less, in line with the recommendation of Tabachnick et al. (2013).

Also, outliers were assessed using Z-scores and Mahalanobis Distance (D2), respectively. A thorough perusal of the dataset indicated that no univariate or multivariate outlier was detected. Again, a normality test was carried out to establish the normal distribution of the dataset using statistical technique. In line with this study's objective, the result of the analysis indicated that the assumption of normality was satisfied; since the data is neither skewed nor kurtotic.

Also, related to multicollinearity, Pearson's correlation showed that the relationship between the exogenous variables is within the recommended threshold by Hair et al. (2014). The preliminary findings implied that multicollinearity is not an issue among the exogenous constructs. Again, regarding non-response bias, the result shows that there is no significant difference between the early and late responses, implying that non-response bias is not an issue in the current study.

Therefore, the preliminary result has proven that this study's dataset was suitable for the future phases of the multivariate analysis, including hierarchical and multiple regressions. Consequently, this study recommends that the dataset be used to explore further the relationship between the predictor variables and the outcome variable.

## Future Research

While the current study focused on the data screening and preliminary analysis of variables related Covid-19 Knowledge, attitude, compliance, and attainment of SDGs in Nigeria, future studies should use the preceding variables to conduct an empirical study using smartPLS.

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