Undergraduates' Knowledge and Practice of Covid 19 Preventive Measures in Tertiary Institutions in Delta State

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Abstract: **This study investigated undergraduates' knowledge and practice of COVID 19 preventive measures in tertiary institutions in Delta State. Three research questions and six null hypotheses guided the study. The study adopted a descriptive survey research design. 1,460 undergraduates in various tertiary institutions in Delta State comprised the study sample. The instrument for data collection was a structured questionnaire titled 'Knowledge and Practice of COVID 19 Preventive Measures among Undergraduates Questionnaire (KPCPMUQ)'. The KPCPMUQ was validated by measurement and evaluation experts. The reliability coefficient of KPCPMUQ was 0.81. Mean and standard deviation statistics were used to answer the research questions. T-t-test and Analysis of Variance (ANOVA) was used to test the null hypotheses at 0.05 level of significance. The findings revealed that undergraduates in tertiary institutions in Delta State to a high extent have knowledge of COVID 19, and the extent of undergraduates' knowledge of COVID 19 in tertiary institutions in Delta State did not differ significantly based on gender and school type. Undergraduates in tertiary institutions in Delta State to a high extent have knowledge of COVID-19 preventive measures, and, the extent of undergraduates' knowledge of preventive measures of COVID 19 in tertiary institutions in Delta State based on gender and school type did not differ significantly. Undergraduates in various institutions in Delta State to a low extent practice COVID-19 preventive measures, and, the extent of undergraduates' practice of COVID 19 preventive measures in tertiary institutions in Delta State did not differ significantly based on gender and school type. Based on the findings, the study recommended among others that the Federal and State governments should make health policies and enforce same to ensure strict compliance to COVID-19 preventive measures in the society. Authorities of tertiary institutions should assist government agencies to ensure that undergraduates strictly comply with NCDC COVID-19 regulations for educational institutions in Nigeria.**

Keywords**: Covid-19, undergraduates, knowledge, practice, preventive measures**

I. INTRODUCTION

There have been fundamental changes to society with the emergence of the coronavirus disease 2019 (COVID 19) global pandemic (Oleribe et al, 2020). COVID- 19 has been a major public health concern since December 2019 when it was 1st detected in Wuhan, China. The infection has no immediate treatment and vaccine, and it has according to World Health Organization (WHO, 2020) become a worldwide pandemic causing significant morbidity and mortality. The World Health Organization declared the outbreak a public health emergency of international concern on 30th January, 2020, and a pandemic on 11th March, 2020. According to the report of the World Health Organization (WHO as of January 30th, 2021), more than 102,636, 343 cases of COVID-19 have been reported in more than 220 countries and territories, resulting in more than 2,216,422 deaths; more than 74,329,596 people have recovered (Worldometer, 2021).

Africa's first case of COVID 19 was recorded in Egypt on 14 February, 2020. Since then, more than 52 African countries have also reported new cases on daily basis and as 30th January, 2021, Africa has confirmed cases of COVID 19 of 3,551,847 with fatality of 89,939 as well as 3,026,867 as number of recoveries (Worldometer, 2021). Nigeria is not left out, as the first confirmed COVID 19 case in Nigeria was announced on 27 February 2020, when an Italian citizen in Lagos tested positive for the virus, caused by SARS-CoV-2 (New York Times, 2020; Nigeria Centre for Disease Control (NCDC), 2020). As of 30th January, 2021, the number of confirmed COVID 19 cases in Nigeria has risen to 128,674 with fatality of 1,557 as well as recovery of 102,780 (NCDC, 2021).

COVID-19, from the family of Coronavirus is a contagious respiratory illness transmitted through the eyes, nose, and mouth, via droplets from coughs and sneezes, close contact with infected person and contaminated surfaces. It has an incubation period of approximately one to fourteen days. The symptoms include cough, fever and shortness of breath, and it is diagnosed through a laboratory test. The contagion could lead to severe respiratory problems or death, particularly among the elderly and persons with underlying chronic illnesses. Some infected persons however, are carriers for the virus with no symptoms while others may experience only a mild illness and recover easily (Sauer, 2020). As there is currently no cure or vaccine for the COVID-19; medical treatments are limited to supportive measures aimed at relieving symptoms, use of research drugs and therapeutics.

Coronavirus disease 2019 has become a major issue in Nigeria as cases have been confirmed almost in all States of the

country including the Federal Capital Territory (FCT) as at November, 2020. Due to lack of vaccine or proven drugs for the management of COVID-19, transmission control becomes a very important intervention that can abate the spread of the disease in community and health care settings (Lin et al, 2020). This is even more important in a country that is deficient in good public health care system such as Nigeria. Despite the efforts put in place by the Nigerian government to mitigate the impact of COVID-19, poor public knowledge, and practices among people relative to COVID-19 control can foil even the best national public health control response. Nigeria may go into second wave of COVID-19 pandemic and to guarantee a successful early containment of the disease, in the absence of vaccine, adherence to control measures determined by people's knowledge, and practices towards COVID-19 is very important (Huang et al, 2020).

The federal government of Nigeria formulated established several committees such as Presidential Task Force (PTF) to respond to the pandemic. The governmental efforts at all levels were complemented by various donations and contributions from the organized private sector, health professional associations, non- governmental organizations (NGOs) and individual volunteers (Oleribe et al, 2020). However, the pandemic in Nigeria continues unabated despite the various efforts of individuals, government and organized. The Nigerian President established the PTF on COVID-19 to manage the outbreak of disease across the country. The PTF was mandated to work with the Federal Ministry of Health (FMOH) and the Nigerian Center for Disease Control (NCDC) in the implementation of the various initiatives and strategies on COVID-19 containment. While FMOH and NCDC were responsible for the implementation of strategies to track the epidemic, to develop management guidelines and to engage and train field workers, the PTF was responsible for local and international relationships, mobilization and management of resources, together with weekly briefings of the President and the Federal Nigerian Government. State and local governments also established similar COVID-19 structures that were all answerable to the local State Governments of the Nigerian Federation.

To prevent further spread of the virus, civil societies and government agencies embarked on enlightenment campaigns for good hygiene and social distancing. Temperature screening was conducted at public places, airports and those returning from countries with numerous confirmed cases of COVID-19 were implored to self-isolate. The NCDC in association with State Governments also began tracing and tracking of possible victims and their contacts. The Federal Government at different times introduced various containment strategies such as closing of the national borders and airspace, schools, worship centers and other public places, canceling of mass gathering events and placing lock down in federal capital territory and other States at some periods (Radio Nigeria, 2020). Similarly, various States such as Lagos, Ogun, Delta, Enugu, Edo among others suspended all gatherings above fifty people for some weeks and instructed the lower and middle level public officers to stay-at-home (Ewodage, 2020). Covid-19 testing laboratories and isolation centres were set up in the federal capital territory and various States of the federation as well as imposition of dawn to dust curfews in order to curb the spread of this deadly disease.

COVID 19 pandemic led to abrupt closure of schools at various levels for several months during lockdown. There is public outcry especially among parents for their children to go back to school after the lockdown. Recently, students who have been away from schools for several months are gradually returning to their various campuses. In attempt to curb further spread of COVID 19 pandemic among students in various schools, the federal government through the federal ministry of education has provided guidelines for safe reopening of schools at different levels in Nigeria. Safe school reopening entails preparedness, adequate capacity, and trust that learners, teachers, administrators, other education personnel, and visitors can safely attend, teach, learn, and carry out other required activities on the premises with very minimal or acceptable levels of risk of COVID-19 infection (Federal Ministry of Education (FME), 2021). It should be available in the school in a sustainable manner as stipulated in these guidelines to ensure that maximum possible safety and protection against COVID-19 infection. Another is to ensure there is effective response should any learner, teacher, administrator, or other education personnel feel unwell while in school and exhibit symptoms associated with COVID-19 infection. For this reason, it is important that these students to have knowledge of COVID 19 and its preventive measures to help the federal government to curb the spread even while on campus.

It is expected that adequate knowledge will help these students to make decisions which may help prevent and curb the spread of the deadly virus. Knowledge such as regular hand washing, using hand sanitizers, wearing face masks, respiratory etiquettes, social distancing and self-isolation when sick are vital to reducing widespread infection (Leppin & Aro, 2009). Studies (Brug, Aro, Oenema, de Zwart, Richardus & Bishop, 2004; Choi & Yang, 2010; Hussain, Hussain & Hussain 2012) revealed that individuals' level of knowledge about an infectious disease can make them behave in ways that may prevent infection. Consequently, individuals may need to be informed about the potential risks of infections in order to adopt the right precautionary measures (Brug, Aro & Richardus, 2009). Based on the importance of knowledge of COVID 19 pandemic in curbing its spread, it is therefore necessary to investigate undergraduates' knowledge and practice of COVID 19 preventive measures to curb the spread of the virus in schools.

Objective of the Study

The main objective of this study is to investigate undergraduates' knowledge and practice of COVID 19

preventive measures in tertiary institutions in Delta State. Specifically, the study sought to determine the;

1. extent undergraduates have knowledge of COVID 19 in tertiary institutions in Delta State
2. extent undergraduates have knowledge of preventive measures of COVID 19 in tertiary institutions in Delta State
3. extent undergraduates practice of COVID 19 preventive measures in tertiary institutions in Delta State
4. extent of undergraduates' knowledge of COVID 19 in tertiary institutions in Delta State did not differ significantly based on gender
5. extent of undergraduates' knowledge of preventive measures of COVID 19 in tertiary institutions in Delta State did not differ significantly based on gender
6. extent of undergraduates' practice of COVID 19 preventive measures in tertiary institutions in Delta State did not differ significantly based on gender
7. extent of undergraduates' knowledge of COVID 19 in tertiary institutions in Delta State did not differ significantly based on institution type
8. extent of undergraduates' knowledge of preventive measures of COVID 19 in tertiary institutions in Delta State did not differ significantly based on institution type
9. extent of undergraduates' practice of COVID 19 preventive measures in tertiary institutions in Delta State did not differ significantly based on institution type

Research Questions

The following research questions guided this study;

1. to what extent do undergraduates have knowledge of COVID 19 in tertiary institutions in Delta State?
2. to what extent do undergraduates have knowledge of preventive measures of COVID 19 pandemic in tertiary institutions in Delta State?
3. to what extent do undergraduates practice COVID 19 preventive measures in tertiary institutions in Delta State?

Hypotheses

The following formulated null hypotheses were tested at .05 level of significance

1. the extent of undergraduates' knowledge of COVID 19 in tertiary institutions in Delta State did not differ significantly based on gender
2. the extent of undergraduates' knowledge of preventive measures of COVID 19 in tertiary institutions in Delta State did not differ significantly based on gender
3. the extent of undergraduates' practice of COVID 19 preventive measures in tertiary institutions in Delta State did not differ significantly based on gender
4. the extent of undergraduates' knowledge of COVID 19 in tertiary institutions in Delta State did not differ significantly based on institution type
5. the extent of undergraduates' knowledge of preventive measures of COVID 19 in tertiary institutions in Delta State did not differ significantly based on institution type
6. the extent of undergraduates' practice of COVID 19 preventive measures in tertiary institutions in Delta State did not differ significantly based on institution type

II. LITERATURE REVIEW

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus that has not been previously identified in humans. It was first detected in Wuhan, China. Some coronaviruses can be transmitted from person to person, usually after close contact with an infected patient, for example, in a household or healthcare setting (WHO, 2021; NCDC, 2021).

The symptoms of COVID 19 include cough, shortness of breath or difficulty in breathing, fever, muscle pain among others. Generally, these infections can cause more severe symptoms in people with weak immune systems, older people, and those with long-term conditions like diabetes, cancer and chronic lung disease. There is no evidence that children are more affected than other age groups -few cases have been reported in children.

The spread of COVID-19 is most likely to happen when there is close contact (within 2 metres) with an infected person. The risk increases the longer someone has close contact with an infected person. Droplets produced when an infected person coughs or sneezes (respiratory secretions) containing the virus are most likely to be the most common means of transmission. There are two routes by which people could become infected: secretions can be directly transferred into the mouths or noses of people who are nearby (within 2 metres) or could be inhaled into the lungs. The other way is possible that someone may become infected by touching a surface or object that has been contaminated with respiratory secretions (such as touching a doorknob or shaking hands with an infected) and then touching their own mouth, nose or eyes.

Empirical Studies

Hatabu, Mao , Zhou, Kawashita, Wen, Ueda et al. (2020) investigated knowledge, attitudes, and practices toward COVID-19 among university students in Japan and associated factors: An online cross-sectional survey. This study evaluated KAP toward COVID-19 among university students in Japan between May 22 and July 16, 2020, via an online questionnaire, and it further investigated the associated determining KAP factors. Among the eligible respondents (n = 362), 52.8% were female, 79.0% were undergraduate

students, 32.9% were students whose major university subjects were biology-related, 35.4% were from the capital region, and 83.7% were Japanese. The overall KAP of university students in Japan was high. All respondents (100%) showed they possessed knowledge on avoiding enclosed spaces, crowded areas, and close situations. Most respondents showed a moderate or higher frequency of washing their hands or wearing masks (both at 96.4%). In addition, 68.5% of respondents showed a positive attitude toward early drug administration. In the logistic regressions, gender, major subjects, education level, nationality, residence, and psychological factors (private self-consciousness and extroversion) were associated with knowledge or attitudes toward COVD-19 ($p < 0.05$). In the logistic and multiple linear regressions, capital regions, high basic knowledge, high information acquisition, correct information explanations contributed positively to preventative action ($p < 0.05$). Non-capital regions, male gender, non-bio-backgrounds, high public self-consciousness, high advanced knowledge, incorrect information explanations, and high extroversion contributed negatively to self-restraint ($p < 0.05$). Moreover, self-restraint was decreasing over time. These findings clarify the Japanese university students' KAP and the related factors in the early period of the COVID-19 pandemic, and they may help university managers, experts, and policymakers control the future spread of COVID-19 and other emerging infections.

Yesuf and Abdu (2022) investigated knowledge, attitude, prevention practice, and associated factors toward COVID-19 among preparatory school students in Southwest Ethiopia. An institution-based cross-sectional study design was used for 422 samples. Each respondent was selected using simple random sampling. Data were collected using a self-administered questionnaire. The collected data were entered and analyzed using Statistical Package for social science software version 25.0. Multivariable binary logistic regression was used to identify factors that were significantly associated with the practice of COVID-19 prevention. The response rate in this study was 96.2%. A higher proportion of the respondents were female (53.9%), Bench (43.6%), and protestant (47.3%). The level of good knowledge, positive attitude, and good practice were 81.8%, 70.9%, and 47.0% respectively. Using social media [AOR: 1.801, 95% CI: 1.005, 3.226], watching television [AOR: 1.884 95% CI: 1.093, 3.247], being knowledgeable [AOR: 5.173 95% CI: 2.276, 11.755], and having a positive attitude [AOR: 4.300 95% CI: 2.351, 7.868] were positively associated with COVID-19 prevention practice. The study concluded that despite the high level of knowledge and a moderate level of positive attitude, the practice of COVID-19 prevention measures was low. Using social media, watching television, being knowledgeable, and having positive attitudes towards COVID-19 increases the tendency to practice COVID-19 prevention measures. School directors and teachers should strictly monitor students for their adherence to COVID-19 prevention measures as directed by the local and national health care departments.

Al-Hanawi, Angawi, Alshareef, Qattan, Helmy, Abudawood, Alqurashi, Kattan, Kadasah, Chirwa and Alsharq (2020) studied knowledge, attitude and practice toward covid-19 among the public in the kingdom of Saudi Arabia: a cross-sectional study. It was a cross-sectional study, using data collected via an online self-reported questionnaire, from 3,388 participants. To assess the differences in mean scores, and identify factors associated with knowledge, attitudes, and practices toward COVID-19, the data were run through univariate and multivariable regression analyses, respectively.

The findings revealed that majority of the study participants were knowledgeable about COVID-19. The mean COVID-19 knowledge score was 17.96 (SD = 2.24, range: 3–22), indicating a high level of knowledge. The mean score for attitude was 28.23 (SD = 2.76, range: 6–30), indicating optimistic attitudes. The mean score for practices was 4.34 (SD = 0.87, range: 0–5), indicating good practices. However, the results showed that men have less knowledge, less optimistic attitudes, and less good practice toward COVID-19, than women. We also found that older adults are likely to have better knowledge and practices, than younger people. The study concluded that targeted health education interventions should be directed to this particular vulnerable population, who may be at increased risk of contracting COVID-19. For example, COVID-19 knowledge may increase significantly if health education programs are specifically targeted at men. Berihun, Walle, Teshome, Berhanu, Abebe, Ademas, Gizeyatu, Keleb, Malede, Atikilt, Teym, and Adane (2021) investigated Knowledge, Attitude, and Preventive Practices Towards COVID-19 Among Students of Ethiopian Higher Education Institutions. Institution -based cross-sectional study design was conducted from December 1 to 30, 2020 among randomly selected 407 undergraduate students from higher education institutions in Ethiopia. The outcome variables were knowledge, attitude, and practices towards COVID-19. Binary logistic regression models at 95% confidence interval (CI) were used to determine the factors affecting knowledge, attitude, and practices towards COVID-19. In multivariable analysis, variables with a p-value of less than 0.05 were considered statistically significant and independently associated with outcome variables at 95% CI.

The findings revealed that 75.9% (95% CI: 72.2–79.9%) of University students had a good knowledge, 62.4% (95% CI: 58.2–67.1%) had a positive attitude, and 56.8% (95% CI: 52.6–61.9%) had a good COVID-19 prevention practices. Students over the age of 30 (AOR=5.8; 95% CI: 1.5, 10.6), third-year students (AOR=3.1; 95% CI: 1.1, 8.9), and being health science students (AOR=4.4; 95% CI: 2.2, 8.9) were significantly associated with a good knowledge towards COVID-19. Urban residents (AOR=0.6; 95% CI: 0.3–0.9), having an average family monthly income of $75USD (AOR=3.5; 95% CI: 1.8–6.7), use of at least one type of social media (AOR=4.7; 95% CI: 1.7–12.9), and having a positive attitude (AOR=2.2; 95% CI: 1.3–3.5) were significantly associated with COVID-19 prevention practices. The study

concluded that despite three-fourths of the participants had a good knowledge, the attitude and prevention practices were low. Age, study year, College of study, presence of chronic illnesses, use of social media, family income, and residence were factors of knowledge, attitude, and prevention practices towards COVID-19. Hence, multiple information dissemination strategies using multiple media outlets should be implemented continuously.

III. METHOD

The study adopted a descriptive survey research design. Descriptive survey research design is one in which a group of people or items is studied by collecting and analyzing data from only a few people or items considered to be a representative of the entire population (Ajayi & Abanobi, 2016). This design was selected for this study because the views of the respondents were collected on knowledge and preventive measures of COVID 19 in tertiary institutions Delta State. The population for this study consisted of all final year undergraduates in various tertiary institutions in Delta State. The choice of this population was that the final year undergraduates are matured enough to present their views in this research. The sample of this study comprised 1,460 undergraduates made up of 535 males and 925 females in various tertiary institutions in Delta State. The sample was selected using a simple random sampling technique to select undergraduates from various tertiary institutions in Delta State.

The instrument used for data collection was a structured questionnaire which the researcher will construct. The instrument was titled 'Knowledge and Practice of COVID 19 Preventive Measures among Undergraduates Questionnaire (KPCPMUQ)'. The KPCPMUQ consisted of two sections viz; section A and section B. Section A was titled Personal Data for collection of particulars of the respondents. Section B was titled questionnaire items and further divided into clusters one, two, and three, these clusters addressed research questions one, two and three respectively. The instrument was a four point rating scale with response options of Very High Extent (VHE), High Extent (HE), Low Extent (LE) and Very Low Extent (VLE). The instrument was validated by experts in Measurement and Evaluation. The experts were requested to examine the face and content validity of the items in the questionnaire as regards to their sentence construction, appropriateness of language, adequacy of questions in relation to the purpose, research questions and hypotheses. The comments and corrections of the experts were reflected before the production of the final copy of the instrument. Reliability of the instrument was determined through a pilot-testing. Copies of the instrument were administered on a sample of 30 final year undergraduates in Nnamdi Azikiwe University in Anambra State. The Cronbach Alpha technique was used to determine internal consistency of the research instrument and it yielded a reliability coefficient of 0.81. This indicated that the instrument was fit for the study.

1,460 copies of the instrument were administered on the final year undergraduates selected for this study. The respondents were given enough time to respond to the questionnaire before collection through the help of research assistance. This exercise was carried for period a month and two weeks. The researcher also ensured that the administered copies of the questionnaire were adequately returned by the research assistants. The data collected from the respondents were used for data analyses. The data collected were analyzed using mean and standard deviation statistics to address the research questions. The decision rule was that any item with a mean score of 2.50 and above was regarded as high extent while any item with a mean score below 2.50 was regarded as low extent. The null hypotheses were tested using t-test statistics and ANOVA. The decision rule was that any null hypothesis with p-value < 0.05 was accepted whereas; reverse is the case for any null hypothesis with p-value > 0.05. All the statistical analyses were done using Statistical Package in Social Science (SPSS).

IV. RESULTS

*Research Question 1***:** To what extent do undergraduates have knowledge of COVID 19 in tertiary institutions in Delta State?

Table 1: Mean and Standard Deviation Scores on the Extent Undergraduates have Knowledge of COVID-19 in Tertiary Institutions in Delta State

S/N	Items	$\bar{x}$	SD	Remark
1.	COVID 19 originated in Wuhan China in December 2019	2.70	1.14	High Extent
2.	COVID 19 can be contracted through sharing of personal belongings	2.70	1.05	High Extent
3.	The infectious disease can be contracted through eating of contaminated water or food	2.59	1.04	High Extent
4.	COVID 19 can be contracted through touching contaminated objects or surfaces	2.61	1.12	High Extent
5.	airborne droplets via breathing, sneezing, or coughing	2.64	1.09	High Extent
6	The elderly with chronic illness are more susceptible to severe symptoms of COVID-19	2.69	1.02	High Extent
7	Touching or eating wild some animals can cause COVID-19 infections	2.74	1.13	Low Extent
8	Regular and proper washing of hands for not less than 20 seconds with soap and water can prevent spread of COVID-19 infection	2.81	1.09	High Extent
9	Social distancing of 2 meters apart can prevents COVID-19 transmissions	2.62	1.06	High Extent
10	Covering our nose with masks can prevent COVID-19 infection	2.65	1.13	High Extent
11	Children and young adult do not need to prevent themselves from COVID-19 infection	2.61	1.13	High Extent
12	COVID-19 can easily be contracted and spread in crowded places	2.63	1.20	High Extent
13	Isolation centres are for severe or not severe COVID-19 cases	2.84	1.04	High Extent

14	Infected person with COVID-19 may not show any symptoms	2.62	1.02	High Extent
15	Persons with less strong immune system are susceptible to risks of COVID-19	2.61	1.26	High Extent
16	There is a cure for COVID-19	2.52	1.14	High Extent
	Grand Mean/SD	2.66	1.14	High Extent

Field Survey Data, 2022, (N=1460)

Data on Table 1 reveals that the respondents rated all items above a mean score of 2.50 which indicates that undergraduates in tertiary institutions in Delta State knowledge of COVID 19. Undergraduates in tertiary institutions in Delta State to a high extent have knowledge of COVID 19 in terms of COVID 19 originated in Wuhan China in December 2019, regular and proper washing of hands for not less than 20 seconds with soap and water can prevent spread of COVID-19 infection, COVID 19 can be contracted through touching contaminated objects or surfaces among others. The above is evidently represented in a grand mean score of 2.66, again, the grand standard deviation score of 1.14 indicates that the undergraduates in various tertiary institutions in Delta State had homogenous view on Knowledge of COVID 19.

Research Question 2: To what extent do undergraduates have knowledge of preventive measures of COVID 19 pandemic in tertiary institutions in Delta State?

Table 2: Mean and Standard Deviation Scores on the Extent Undergraduates have Knowledge of Preventive Measures of COVID-19 in Tertiary Institutions in Delta State

S/N	Items	$\bar{x}$	SD	Remark
17.	Wearing of protective face masks or scarf in public	2.70	1.08	High Extent
18.	Observe social distance	2.56	1.06	High Extent
19.	Avoid large gathering	2.53	1.25	High Extent
20.	Avoid shaking hands	2.73	1.15	High Extent
21.	Regular hand washing with soap under running water	2.61	1.21	High Extent
22.	Using of alcohol based sanitizer or hand drop	2.57	1.00	High Extent
23.	Regular cleaning of surfaces at home/offices among others	2.83	1.07	High Extent
24.	Laundering of dresses immediately after use especially in public places	2.85	1.08	High Extent
25.	Coughing or sneezing with elbow or clean handkerchief	2.59	1.08	High Extent
26.	Regular washing of face masks	2.65	1.16	High Extent
27.	Airing and sun drying foot wears immediately after use in public	2.67	1.19	High Extent
28.	Avoiding touching surfaces in public places	2.62	1.21	High Extent
29.	Regular cleaning of mobile phones surfaces especially after use in public places	2.81	1.02	High Extent
30.	Airing and sun drying clothes after use if tired of washing immediately	2.76	1.04	High Extent
	Grand Mean/SD	**2.68**	**1.11**	High Extent

Field Survey Data, 2022, (N=1460)

Analysis on Table 2 shows that the respondents rated all items were above a mean score of 2.50. This indicates that undergraduates in tertiary institutions in Delta State to a high extent have knowledge of COVID-19 preventive measures. The evidence of the above is indicated in a grand mean score of 2.68. Similarly, the grand standard deviation score of 1.11 reveals that undergraduates of various tertiary institutions in Delta State had same opinion on knowledge of COVID-19 preventive measures.

Research Question 3: To what extent do undergraduates practice COVID 19 preventive measures in tertiary institutions in Delta State?

Table 3: Mean and Standard Deviation Scores on the Extent Undergraduates Practice of COVID-19 Preventive Measures in Tertiary Institutions in Delta State

S/N	Items	$\bar{x}$	SD	Remark
31.	Wearing of protective face masks or scarf in public	2.30	1.08	Low Extent
32.	Observe social distance	2.20	1.07	Low Extent
33.	Avoid large gathering	2.20	1.06	Low Extent
34.	Avoid shaking hands	2.13	0.96	Low Extent
35.	Regular hand washing with soap under running water	2.66	1.21	High Extent
36.	Using of alcohol based sanitizer or hand drop	2.25	1.05	Low Extent
37.	Regular cleaning of surfaces at home/offices among others	2.18	1.03	Low Extent
38.	Laundering of dresses immediately after use especially in public places	2.28	1.08	Low Extent
39.	Coughing or sneezing with elbow or clean handkerchief	2.58	1.19	Low Extent
40.	Regular washing of face masks	2.36	1.06	Low Extent
41.	Airing and sun drying foot wears immediately after use in public	2.53	1.05	High Extent
42.	Avoiding touching surfaces in public places	2.23	1.08	Low Extent
43.	Regular cleaning of mobile phones surfaces especially after use in public places	2.43	1.08	Low Extent
44.	Airing and sun drying clothes after use if tired of washing immediately	2.62	1.22	High Extent
	Grand Mean/SD	**2.35**	**1.09**	**Low Extent**

Field Survey Data, 2022, (N=1460)

Data analyzed on Table 3 indicates that all items were rated by undergraduates of various tertiary institutions in Delta State below a mean score of 2.50. This reveals that

undergraduates in various institutions in Delta State to a low extent practice COVID-19 preventive measures. This evidence is indicated in a grand mean score of 2.35. Added to that, the grand standard deviation score of 1.22 reveals that undergraduates in various tertiary institutions in Delta State had similar response on practice of COVID-19 preventive measures.

Hypothesis 1: The extent of undergraduates' knowledge of COVID 19 in tertiary institutions in Delta State did not differ significantly based on gender

Table 4: Test of Difference on the Extent of Undergraduates' Knowledge of COVID-19 in Tertiary Institutions Based on Gender

Gender	$\bar{x}$	SD	N	df	t-cal	Sig.
Male	43.49	8.75	535	1458	-1.946	.070
Female	44.52	10.25	925			

*p-value > 0.05

Data presented on Table 4 reveal that the value of t-calculated is -1.96 with p-value > 0.05 (.070 > 0.05). Thus, the null hypothesis was accepted. This indicates that the extent of undergraduates' knowledge of COVID 19 in tertiary institutions in Delta State based on gender did not differ significantly.

Hypothesis 2: The extent of undergraduates' knowledge of preventive measures of COVID 19 in tertiary institutions in Delta State did not differ significantly based on gender

Table 5: Test of Difference on the Extent of Undergraduates' Knowledge of Preventive Measures of COVID-19 in Tertiary Institutions Based on Gender

Gender	$\bar{x}$	**SD**	**N**	**Df**	**t-cal**	**Sig.**
Male	42.68	8.74	535	1458	-1.515	.049
Female	43.46	9.87	925			

*p-value > 0.05

Table 5 indicates that p-value > 0.05 (.049 > 0.05) with t-calculated of -1.515. Hence, the null hypothesis was accepted. This reveals that the extent of undergraduates' knowledge of preventive measures of COVID 19 in tertiary institutions in Delta State based on gender did not differ significantly.

Hypothesis 3: The extent of undergraduates' practice of COVID 19 preventive measures in tertiary institutions in Delta State did not differ significantly based on gender

Table 6: Test of Difference on the Extent of Undergraduates' Practice of COVID-19 Preventive Measures in Tertiary Institutions Based on Gender

Gender	$\bar{x}$	SD	N	df	t-cal	Sig.
Male	43.18	8.67	535	1458	-1.145	.564
Female	43.71	8.57	925			

*p-value > 0.05

Analysis on Table 6 reveals that t-calculated has a value of -1.145 with p-value greater than 0.05 (.564 > 0.05). This indicates that the extent of undergraduates' practice of COVID 19 preventive measures in tertiary institutions in Delta State based on gender did not differ significantly.

Hypothesis 4: The extent of undergraduates' knowledge of COVID 19 in tertiary institutions in Delta State did not differ significantly based on institution type

Table 7: Test of Difference on the Extent of Undergraduates' Knowledge of COVID-19 in Tertiary Institutions Based on Institution Type

Source of Variation	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	1316.276	2	658.138	8.925	.061
Within Groups	107434.937	1457	73.737		
Total	108751.213	1459			

*p-value > 0.05

Data presented on Table 7 indicates no significant difference given that $F_{(1457)} = 8.925$, and $p > 0.05$ (.061 > 0.05), hence, the null hypothesis is accepted. This implies that the extent of undergraduates' knowledge of COVID 19 in tertiary institutions in Delta State based on school type did not differ significantly.

Hypothesis 5: The extent of undergraduates' knowledge of preventive measures of COVID 19 in tertiary institutions in Delta State did not differ significantly based on institution type

Table 8: Test of Difference on the Extent of Undergraduates' Knowledge of Preventive Measures of COVID-19 in Tertiary Institutions Based on Institution Type

Source of Variation	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	466.956	2	233.478	3.293	.237
Within Groups	103294.668	1457	70.895		
Total	103761.624	1459			

*p-value > 0.05

Analysis on Table 8 reveals that $F_{(1457)} = 3.293$, and $p > 0.05$ (.237 > 0.05), hence, the null hypothesis is accepted. This indicates that the extent of undergraduates' knowledge of preventive measures of COVID 19 in tertiary institutions in Delta State based on school type did not differ significantly.

Hypothesis 6: The extent of undergraduates' practice of COVID 19 preventive measures in tertiary institutions in Delta State did not differ significantly based on institution type

Table 9: Test of Difference on the Extent of Undergraduates' Practice of COVID-19 Preventive Measures in Tertiary Institutions Based on Institution Type

Source of Variation	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	190.817	2	95.408	1.083	.339
Within Groups	128374.581	1457	88.109		
Total	128565.397	1459			

*p-value > 0.05

Data analyzed on Table 9 shows that $F_{(1457)} = 1.083$, and $p > 0.05$ (.339 > 0.05), hence, the null hypothesis is accepted. This reveals that the extent of undergraduates' practice of COVID 19 preventive measures in tertiary institutions in Delta State based on school type did not differ significantly.

V. SUMMARY OF FINDINGS

1. Undergraduates in tertiary institutions in Delta State to a high extent have knowledge of COVID 19, and the extent of undergraduates' knowledge of COVID 19 in tertiary institutions in Delta State did not differ significantly based on gender and school type.
2. Undergraduates in tertiary institutions in Delta State to a high extent have knowledge of COVID-19 preventive measures, and, the extent of undergraduates' knowledge of preventive measures of COVID 19 in tertiary institutions in Delta State based on gender and school type did not differ significantly.
3. Undergraduates in various institutions in Delta State to a low extent practice COVID-19 preventive measures, and, the extent of undergraduates' practice of COVID 19 preventive measures in tertiary institutions in Delta State did not differ significantly based on gender and school type.

VI. DISCUSSION

One of the findings of this study revealed that undergraduates in tertiary institutions in Delta State to a high extent have knowledge of COVID 19, also, the extent of undergraduates' knowledge of COVID 19 in tertiary institutions in Delta State did not differ significantly based on gender and school type. The above supports the findings of Hatabu, Mao, Zhou, Kawashita, Wen, Ueda et al. (2020) found that all respondents (100%) showed they possessed knowledge on avoiding enclosed spaces, crowded areas, and close situations. Most respondents showed a moderate or higher frequency of washing their hands or wearing masks (both at 96.4%). In addition, 68.5% of respondents showed a positive attitude toward early drug administration. Similarly, Al-Hanawi, Angawi, Alshareef, Qattan, Helmy, Abudawood, Alqurashi, Kattan, Kadasah, Chirwa and Alsharq (2020) found that majority of the study participants were knowledgeable about COVID-19. The mean COVID-19 knowledge score was 17.96 (SD = 2.24, range: 3–22), indicating a high level of knowledge. The mean score for attitude was 28.23 (SD = 2.76, range: 6–30), indicating optimistic attitudes. Furthermore, Oleribe et al (2020) found that, over 98.8% of the respondents had heard of COVID-19 and 95.4% knew it is a viral disease. Also, Reuben, Danladi, Saleh & Ejembi (2020) found that there is good knowledge (99.5%) of COVID-19 among subjects investigated. In addition, Hager (2020) found that majority of the respondents (61.6%) had a satisfactory knowledge of the disease.

Furthermore, the findings of this study revealed that undergraduates in tertiary institutions in Delta State to a high extent have knowledge of COVID-19 preventive measures, furthermore, the extent of undergraduates' knowledge of preventive measures of COVID 19 in tertiary institutions in Delta State based on gender and school type did not differ significantly. This is in consonance with the findings of Al-Hanawi, Angawi, Alshareef, Qattan et al (2020) that majority of the study participants were knowledgeable of preventive measures of COVID-19. The mean score for practices was 4.34 (SD = 0.87, range: 0–5), indicating good practices. Similarly, Yesuf and Abdu (2022) found a good level of knowledge of preventive measures among the respondents in the study. Also, Oyetunde et al (2020) found that most respondents (81.0%) have been avoiding crowded places and 61.3% washed their hands very often.

Finally, it was revealed in the findings that undergraduates in various institutions in Delta State to a low extent practice COVID-19 preventive measures. In addition to the findings, the extent of undergraduates' practice of COVID 19 preventive measures in tertiary institutions in Delta State did not differ significantly based on gender and school type. The above agrees with the finding of Presidential Task Force (PTF) (2020) that found that greater number of Nigerian populace do not adhere to NCDC COVID regulations. Similarly, Yesuf and Abdu (2022) found that despite the high level of knowledge and a moderate level of positive attitude, the practice of COVID-19 prevention measures was low. However, the findings of this study contradicts the findings of Hager (2020), Al-Hanawi, Angawi, Alshareef, Qattan et al (2020) and Berihun, Walle, Teshome, Berhanu et al (2021) there was a good practice of COVID 19 among majority of the respondents. The mean score for practices was 4.34 (SD = 0.87, range: 0–5), indicating good practices. However, the results showed that men have less knowledge, less optimistic attitudes, and less good practice toward COVID-19, than women. The study also found that older adults are likely to have better knowledge and practices, than younger people.

VII. CONCLUSION

Based on the findings, the study concluded that undergraduates in tertiary institutions in Delta State to high extent have good knowledge of the COVID-19. They also to a high extent have good knowledge of COVID-19 preventive measures. Undergraduates in tertiary institutions in Delta State to a low extent practice COVID-19 preventive measures.

VIII. RECOMMENDATIONS

Based on the findings, the study made the following recommendations;

1. The Federal and State governments should make health policies and enforce same to ensure strict compliance to COVID-19 preventive measures in the society.
2. Authorities of tertiary institutions should assist government agencies to ensure that undergraduates strictly comply to NCDC COVID-19 regulations for educational institutions in Nigeria.
3. Undergraduates are advised to adhere and for all COVID-19 protocols stipulated in their various institutions and avoid any form of corrective measures that will be placed on defaulters within the school environment.

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