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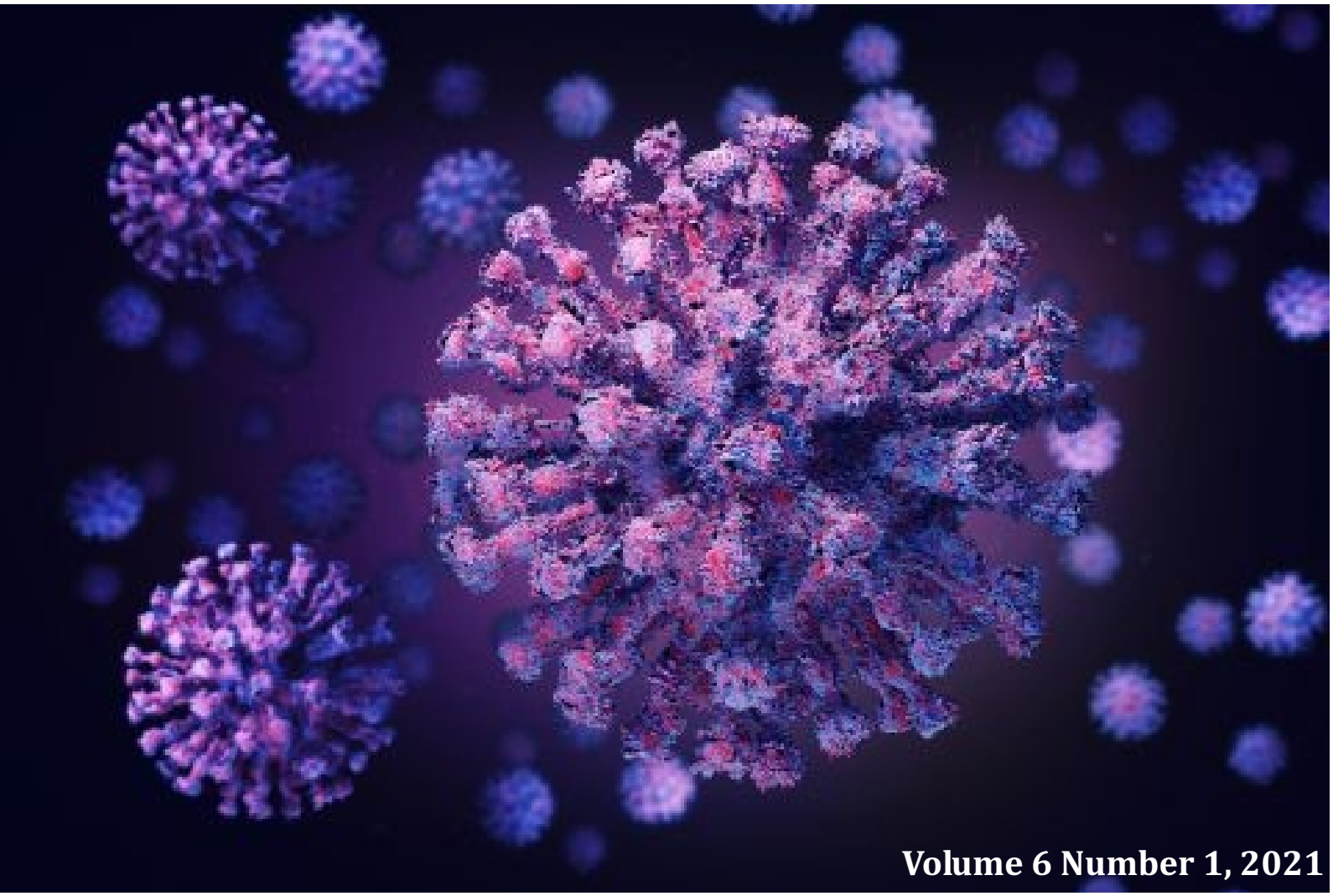

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Knowledge, Attitudes, and Practices toward COVID-19 Prevention among University Students at Enugu State University of Science and Technology

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Abstract

Coronavirus is a global pandemic that has adversely disrupted social, political, economic, and educational activities worldwide. Reports have shown reductions in the rate of school enrollment, changes in the mode of learning, poor funding, and death of students as a result of the COVID-19 pandemic. Global efforts to prevent the virus and reduce mortality from the disease, including manufacturing the vaccine, seemed to have not solved all the COVID-19-related challenges. The population of Nigerian undergraduate students is more than 2 million, and the knowledge, Attitudes, and Practices (KAP) on COVID-19 prevention among students in Enugu State, Nigeria, are still unclear. This study was undertaken to assess KAP among undergraduates at Enugu State University of Science and Technology (ESUT). A cross-sectional study was conducted among 364 randomly selected undergraduate students. An online structured questionnaire was used to collect the data and analyzed using descriptive statistics. The results revealed that students have relatively good knowledge about the disease. However, there is a negative attitude and poor practice toward disease prevention, especially COVID-19 vaccination. There is a need to embark on a youth-friendly COVID-19 comprehensive prevention measure in universities so that students can make an informed decision toward COVID-19 prevention.

Keywords: Attitudes, knowledge, Practices, COVID 19, Prevention and University Students

Introduction

It is no longer news that the COVID-19 pandemic has affected almost all the world's nations. What is of concern to many, especially researchers, are understanding the extent of damage, how to cushion its adverse effects, and people's behavior towards its prevention. Recent reports from Statista (2021) show that the number of people infected with COVID-19 is over 176.2 million, and deaths have reached above 3.8 million persons worldwide. The international community has not relented in its efforts to contain the further escalation of the virus. United Nations (2021), among other things, had launched the COVID-19 Solidarity Response Fund seeking an appeal for US$ 1.96 billion to fulfill the requirements of the 2021 Strategic Preparedness and Response plan. Global efforts to prevent the virus and reduce mortality from the disease, including vaccine

manufacturing, seemed to have not solved all the COVID-19-related challenges. A report has raised concern over the possible third wave of COIVD 19 pandemic in Africa (Mwai, 2021).

One of the institutions that are greatly affected by COVID-19 is an educational institution. The impact on education ranges from reductions in the rate of school enrollment, changes in the mode of learning, poor funding, and death of students as a result of the COVID-19 pandemic (Bravata et al., 2021). Most countries implemented lockdown measures to contain the virus's spread, significantly affecting educational institutions. According to UNESCO (2021), more than 1.598 billion students from 194 countries were required to stay at home because of the closure of educational institutions. Apart from the devastating health consequences for the students directly affected by the virus, the COVID-19 pandemic holds significant implications for how university students have managed the unprecedented challenges and expectations accompanying the pandemic (Aristovnik, 2020).

The government has reopened commercial activities, including schools in Nigeria, with a strict warning that all schools must follow observed international best practices on COVID-19 preventive protocols. The Nigeria NCDC, in partnership with the Federal Ministry of Education, developed guidelines for schools to ensure the safety of students and staff while carrying out academic activities (Federal Ministry of Education, 2020). The guidelines stipulate several essential activities based on the critical strategies of physical distancing, hand hygiene, environmental cleaning, face masks, screening, isolation, and notification for further action. Though there are prevention guidelines from authorities, the resumption of schools may likely expose students to risky behaviors that may predispose them to COVID-19 infections. Moreover, it is still unclear how much students know about these prevention protocols, their attitude toward them, and their practices in Nigeria. Nigerian undergraduate students are more than 2 million, yet not many studies have been done to assess this population's knowledge, attitudes, and practices on COVID-19 prevention. It has been observed that understanding people's knowledge, attitudes, and practices (KAP) toward disease is essential for disease prevention. It can also aid in developing effective interventions to mitigate its effects, which may have long-term implications for people's health and well-being (Jones et al., 2021).

Enugu State University of Science and Technology (ESUT) management has put in place mechanisms to ensure that government stipulated COIVD 19 prevention protocols within its

campuses are duly observed. However, it appears that the inability of the school authorities to enforce COVID-19 prevention protocol among students strictly; may further make the students vulnerable to contracting the virus. Hence, it becomes imperative to ascertain the KAP toward COVID-19 prevention among undergraduate students in ESUT because intervention to reduce the COVID-19 incidence rate among students may not achieve evidence-based results if an objective assessment of their KAP towards disease prevention is not assessed. Thus, this study was undertaken to assess KAP among undergraduate students at Enugu State University of Science and Technology (ESUT).

Literature Review

Knowledge about COIVD 19 prevention

Alrasheedy et al (2021) conducted a cross-sectional study among Saudi pharmacy students to determine the extent of knowledge, attitude, and practice about the coronavirus disease (COVID-19) pandemic and its psychological impact on students and their studies. The study found that the mean total knowledge score was 9.87 ± 2.04 out of the maximum attainable score of 12. Consequently, the overall rate of correct answers for the knowledge statements was 82%. It may be expected that medical students should have good knowledge of medical conditions like COVID-19.

Also, a web-based cross-sectional study on knowledge, attitudes, and practices related to the COVID-19 outbreak among young Bangladeshi adults showed that 61.2% had adequate knowledge. However, apparent confusion was found among participants regarding the mode of transmission of COVID-19. Only 38.0% of participants correctly reposed that the COVID-19 virus is not airborne, and very few (n = 306, 43.3%) were able to respond to COVID-19 Prevention correctly when asked if eating and touching wild animals could result in infection (Banik et al., 2020). The implication from these findings showed that the knowledge of COVID-19 among studied participants looked artificial because they seemed to lack knowledge on issues around virus transmission. Furthermore, a cross-sectional study on knowledge, attitude, and practice toward COVID-19 pandemic among 384 persons visiting Dessie health center for covid-19 screening in Northeast Ethiopia revealed that the magnitude of good and poor knowledge among the study participants was found to be 197 (51.3%) and 187 (48.7%), respectively. Many study

participants had poor knowledge about the significant symptoms, fever, cough, sore throat, muscle pain, and difficulty breathing of COVID-19 (Gebretsadik et al., 2019). The implication of the finding may be that the scope allowed for all young and old clients, unlike some similar studies that are limited to medical students or the adult population.

A cross-sectional study on knowledge, attitude, and practices toward COVID-19 among nursing and midwifery students in Jalingo, Nigeria, revealed that a majority of the students (53.80%) possessed a good level of knowledge regarding COVID-19. The mean knowledge of COVID-19 in this study was 9.40±1.353 (range 0-12). This score suggests an overall 78% (9.40/12*100) correct answer rate (Inegbenosun et al., 2021).

Attitude toward COVID 19 prevention

Alrasheedy et al., (2021) found that most participants (n=165; 71.1%) agreed that COVID-19 would eventually be successfully controlled. At the early stages of the pandemic, the majority (n=163; 70.3%) believed that COVID-19 was a health threat to the community.

A web-based cross-sectional study on knowledge, attitudes and practices related to the COVID-19 outbreak among young Bangladeshi adults found that a majority of the participants had a positive attitude towards COVID-19 (n = 558, 78.9%) with a mean attitude score of 2.7 (SD: 0.3). About 87% (614) of the participants agreed that COVID-19 would successfully be controlled with the rate of reporting "disagree" and "not sure" was 4.2% and 8.9% respectively (Banik et al., 2020).

Furthermore, a cross-sectional study on knowledge, attitude, and practice toward the COVID-19 pandemic among 384 people visiting Dessie health center for covid-19 screening in Northeast Ethiopia showed that a majority of study participants (71.9%) believed that traditional medicines, such as eating garlic, were ineffective in preventing infection with the new coronavirus. About 49.2% of the study participants perceived that COVID-19 could not affect young people, and many study participants will not go to a quarantine center if they develop the disease. The majority of study participants perceived that the measurements taken by the Ethiopian Ministry of Health were helpful and that the country could win the battle against COVID-19 (Gebretsadik et al., 2019).

Inegbenosun et al (2021) conducted a cross-sectional study on knowledge, attitude, and practices towards COVID-19 among nursing and midwifery students in Jalingo, Nigeria, and found that the vast majority of respondents (98.1%) were optimistic about the pandemic prevention, with almost all (98.1%) agreeing that the pandemic will be finally controlled. A vast majority of the respondents (82.7%) had strong confidence that Nigeria could win the battle against the COVID-19 virus, with just 27 participants (17.3%) with a contrary opinion.

Practice toward COVID 19 prevention

Alrasheedy, et al (2021) conducted a cross-sectional study to assess students' knowledge, attitudes, and practices regarding the coronavirus disease (COVID-19) pandemic and its psychological impact on their studies: Among Pharmacy Students in Saudi Arabia, 201 (86.6%) did not go to any crowded places during these days, and 155 (66%) reported wearing a mask when leaving the house. Moreover, the vast majority of participants (n = 211; 91%) reported that they were following the strategies recommended by the authorities, e.g., the Ministry of Health, to prevent infection and spread of COVID-19.

A web-based cross-sectional study of young Bangladeshi adults' knowledge, attitudes, and practices regarding the COVID-19 outbreak revealed that only 51.6% had good practices. In addition, 75.2% of participants always washed their hands with soap or hand sanitizer, and 70.6% wore a mask when leaving the house in the last few days (Banik et al., 2020).

Furthermore, in a cross-sectional study on knowledge, attitude, and practice toward the COVID-19 pandemic among 384 persons visiting Dessie health center for covid-19 screening, Northeast Ethiopia, the magnitude or level of poor practice in the current study was found to be 41.7%. Two hundred and forty (62.5%) study participants reported going to crowded places. The majority (69.3%) of the respondents used a face mask when they left their homes, but the number of study participants who did not use a face mask was also higher. The other less frequently practiced preventive measures (10.4%) were avoiding recontamination after handwashing from a pipe or other water container materials and practicing physical distancing (45.1%). About 55% of study participants did not keep the recommended distance when they spoke in front of others (Gebretsadik et al., 2019)**.**

Knowledge, attitude, and practices towards COVID-19: a cross-sectional study among nursing and midwifery students in Jalingo, Nigeria, revealed that only a few students avoided large gatherings of people (30.8%) with the vast majority reporting to have worn a mask when going out (84.6%) and washing their hands with running water and soap frequently as recommended (73.1%) (Inegbenosun et al., 2021).

Methods

Research Design

The study employed a cross-sectional survey research design. The design is found suitable for the study because it provides the techniques to collect data from selected undergraduate students in ESUT at a particular point in time and the findings were generalized to the target population. This institutional-based quantitative cross-sectional study design was conducted from May 10th to 28th, 2021.

Area of Study and Population

The study was conducted at Enugu State University of Science and Technology (ESUT). ESUT is the only government-owned university in Enugu State. The headquarters is located in Agbani Nkanu West Local Government Areas of Enugu State. The total population of undergraduate students in ESUT was 18,702 (Academic Planning Records, 2020).

Sample Size and Sampling Technique

The study used the Taro Yamane formula for sample size determination. This formula provides simplistic steps of determining appropriate sample size for a finite (known) population, using a 95% confidence level and a 5% margin of error. The sample size for the study was 392 students. Cluster sampling technique was used to divide the departments in ESUT along with art/humanities-related discipline and Science related discipline. Simple random sampling was used to select one department from each of the two cohorts (art/humanities and science-related disciplines). Furthermore, students list and phone contact were obtained from their respective departments and a simple random method was used to select the study participants by lottery method.

Data Collection

The study employed a structured online questionnaire as the only instrument for data collection. The questionnaire was divided into two sections. Section A dealt with the sociodemographic characteristics of the respondents while Section B dealt with substantive issues in the research questions. One-day pre-test data collection exercise was conducted to validate the reliability of the instrument in providing accurate results. The data collection process was online based. The questionnaire was distributed to the selected respondents through different online platforms. A total of 392 questionnaires were distributed but only 364 (92%) of them were properly filled and returned for analysis.

Method of Data Analysis

The Statistical Package for Social Sciences (SPSS) 20.0 was used to process the data collected with the questionnaire. Questionnaire data obtained was presented, analyzed, and interpreted using descriptive statistical tools such as simple percentages in table pie chart and bar chart.

Results

Socio-demographic characteristic of respondents

The study showed that a majority 63.2% of the respondents were female students while 36.8% were males. In all, the mean age of respondents was 20.6. Virtually all the respondents 97.4% were single, only 2.6% were married. A majority 40.8% of the respondents were Catholics. This was closely followed by 39.5% of them who were Pentecostal while 18.4% were Protestants. Only 1.3% adhered to traditional religion. On the academic level of the students, a majority 42.1% of the respondents were in their fourth year while 9.2% of them were either in the first and second year respectively. A majority 73% of the respondents were in Art/Humanities related discipline while 26.3% were of them were science students.

Analysis of Research Questions

Students' Knowledge of COVID 19 and Prevention

To assess students' level of knowledge of COVID 19 and its prevention, questions on types of infection, main transmission method, incubation period, clinical manifestation, and non-pharmaceutical method of prevention.

Table 1: Distribution of respondents on knowledge of the type of infectious disease does COVID 19 belong to

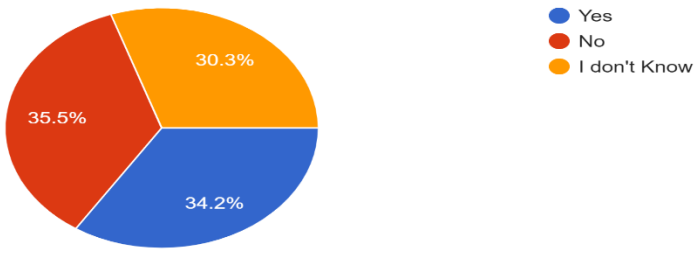
knowledge of the type of infectious disease does COVID 19 belong to			
	Bacterial	Viral	I don't know
What type of infectious is Covid-19?	22.4%	69.7%	7.9%

Field survey 2021

Table 1 showed that the majority of the students had accurate knowledge of the type of infectious disease COVID 19 belongs to. However, more than 20% of them gave the wrong answers while 7.9% of them do not know at all.

Also, the finding revealed that an overwhelming majority 97.4% of the respondents knew that respiratory droplets and close contacts are the main transmission method while only a few 2.6 indicated that they do not know. In addition, the majority 75% of the respondents answered correctly that COVID 19 incubation period span from 1-14 days while 11.8% do not know COVID 19 incubation period. Moreover, a significant majority 94.7% of the respondents correctly identified fever and dry cough as the main clinical manifestation. Overall, the students demonstrated good knowledge of the virus. This implication may be that awareness campaigns by all stakeholders at different levels to increase public knowledge about the disease may have contributed to the high knowledge of COVID 19 among the students. Also, these are students who are constantly informed by virtue of their academic environment. Furthermore, students' knowledge was questioned on the non-pharmaceutical method of prevention, the responses are shown in figure 1

Figure 1 non-pharmaceutical method of prevention is important for COVID 19

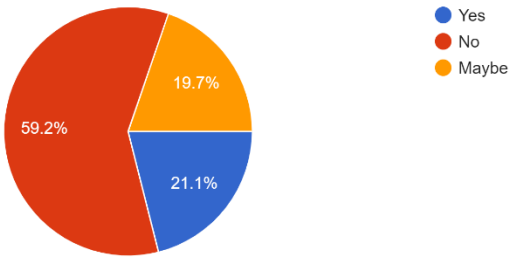


Fieldwork, 2021

Figure 1 clearly showed that a majority 35.5% of respondents disagreed that non-pharmaceutical method of prevention for COVID 19 is important. This is closely followed by 34.2% of them who were in affirmation while a significant number 30.3% who did not know. This finding spring surprises and may suggest that the knowledge of many of the respondents about this virus looks artificial.

Attitude towards COVID 19 prevention

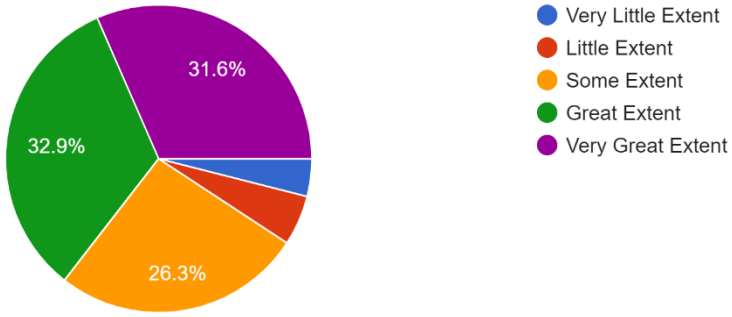
Figure 2: Whether students were worried they might get COVID 19



Fieldwork, 2021

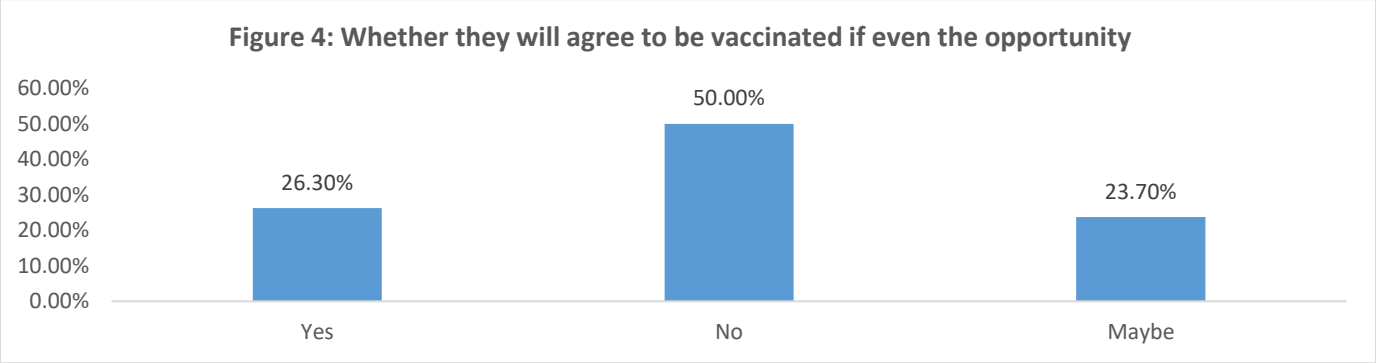
Figure 2 showed that a majority 72.4% of the respondents indicated that they are not worried they might get COVID 19. Only 19.7% of them said they are worried while 7.9% of them were indifferent. The respondents were further asked a follow-up question on whether they think Covid-19 prevention measures should only be applied by older adults and age groups most risk. The majority 72.4% of the respondents indicated no as their responses while 19.7% said yes. Only 7.9% were not sure of their position. Also, the opinion of the respondents was sought on whether they will seek to visit a health facility if they develop symptoms of COVID 19, the result revealed that 56.6% agreed that they will seek medical help while only 7.9% disagreed. Furthermore, the respondents were asked to what extent do they think practicing personal hygiene such as wearing facial masks and hand hygiene is an effective way to reduce the risk of COVID-19 infection. The responses are shown in figure 3

Figure 3: Extent of practicing personal hygiene such as wearing facial masks and hand hygiene



Fieldwork, 2021

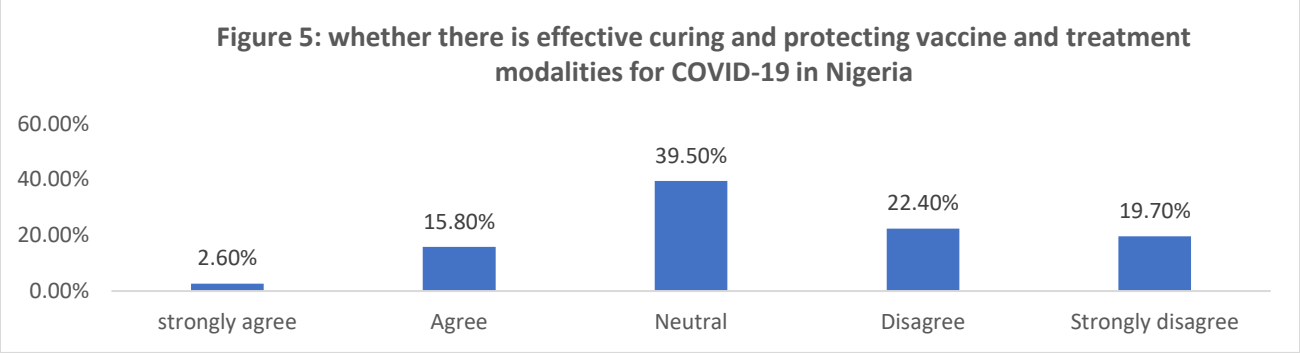
Figure 3 showed that the majority 32.9% of the respondents indicated to a great extent while 9.2% of them said either to a little extent or very little extent respectively. Furthermore, on social distancing such as avoiding crowded places, a majority 31.6% of the respondents said to a great extent while 7.9% said to a little extent. Moreover, an overwhelming majority 88.2% of the respondents believed that students are vulnerable to COVID 19 while only 9.2% said that they are not vulnerable. This is further validated by a majority 71.1% of the respondents who were in the affirmation that COVID 19 has impacted negatively on their studies while 22.4% did not affirmed that it has impacted negative on their studies. The respondents were asked if they will agree to be vaccinated if, given the opportunity, the responses are shown in figure 4



Fieldwork, 2021

The findings from figure 4 showed that a majority 50% of the respondents said they will not agree to be vaccinated when given the opportunity. 26.3% of them said they will agree to be vaccinated if given the opportunity while only 23.7% were indifferent. To deepen understanding of

respondent's attitude about prevention of the disease, the question on whether there is an effective curing and protecting vaccine and treatment modalities for Covid-19 in Nigeria was asked, the responses are shown in figure 5



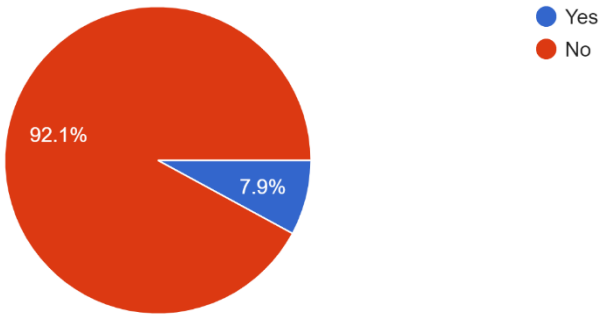
Fieldwork, 2021

The findings from figure 5 showed that a majority of 39.50% of the respondents were indifferent on whether there is effective curing and protecting vaccine and treatment modalities for COVID-19 in Nigeria. Also, 22.4% of them disagreed that there is effective curing and protecting vaccine and treatment modalities for COVID-19 in Nigeria while only 15.8% of the respondents indicated agreed. This further validates the true reflection of public perception including students toward COVID 19 prevention in Nigeria, however, the implication could also be that there is a communication gap and mutual distrust between authorities and the students on government comprehensive prevention plan and its implications toward COVID 19 prevention in Nigeria.

Practice of COVID 19 prevention

On handwashing, a majority 78.9% indicated that they are committed to washing hands while 19.7% said they are not committed. Also, on practicing the proper methods of coughing and sneezing etiquette, a majority 63.2% of the respondents were in affirmation while 26.7% indicated no. Furthermore, respondents were asked about the practice of wearing face mask regularly, the result showed that 53.9% of the respondents affirmed that they wear face mask regularly. This is closely followed by 40.8% who said that they do not while 5.3% remained undecided. Moreover, the respondents were asked whether they have been vaccinated, the responses are shown in figure 6

Figure 6: Practiced COVID 19 Vaccination



Fieldwork, 2021

Figure 6 revealed that the overwhelming majority 92.1% of the respondents have not received COVID 19 vaccination while only 7.9% said that they have received the vaccine. This finding is expected owning to the vaccine hesitant which is widespread in Nigeria.

Ways to improve student's KAP towards COVID 19 Prevention

Questions were posed to respondents on ways to improve students' KAP towards COVID 19 prevention. The result revealed that the majority 59.4% of the respondents suggested a constant youth friendly campaign on COVID 19 prevention in the campuses. Also, the findings showed that 30% of the respondents said suggested strict enforcement to observe COVID 19 preventive protocol within campuses while 10.6% of them said providing adequate prevention facilities/commodities for the students.

Discussion of Findings

The study assessed how much knowledge undergraduate students in ESUT have about COVID-19 prevention. The findings found that students have adequate knowledge of the virus, such as the type of the infection, primary transmission method, incubation period, and leading clinical manifestation. This finding supports earlier studies on students' knowledge, attitude, and practice (Alrasheedy et al., 2021; Inegbenosun et al., 2021). Since the beginning of the COVID-19 pandemic, there has been consistent awareness creation across all media platforms. This may have contributed to the excellent knowledge of the virus among the students studied. However, the study also found that many respondents did not know that non-pharmaceutical methods are essential in preventing COVID-19. This may imply that students having good knowledge of the disease may

not necessarily translate to good knowledge of the importance of prevention measures. This calls for further interrogation to identify factors informing such positions among students.

On the student's attitude toward COVID-19 prevention, the study found that most respondents are not worried that they might contract COVID-19. This could be attributed to self-denial, where most people disassociate from negative results. On the contrary, the study revealed that many students believed that prevention measures should not only be applied to older adults and age groups most risk relatively by everybody. This finding contradicts a previous study in Ethiopia, which showed that about 49.2% of participants perceived that COVID-19 could not affect young people. Many were unwilling to go to a quarantine center if they developed the disease (Gebretsadik, et al., 2019). Furthermore, it was discovered that students have a positive attitude toward COVID-19 prevention because many of them chose to seek professional medical help if they contracted the virus and are willing to practice personal hygiene such as wearing facial masks and hand hygiene as an effective way to reduce the risk of COVID-19. This agrees with studies done in Bangladesh and Nigeria, which showed that the respondents had a positive attitude toward COVID-19 prevention (Banik et al., 2020; Habib et al., 2021). However, on the issue of vaccination, the majority of the respondents were not willing to take the COVID-19 vaccine if given the opportunity. This situation presents the contradictory attitude of the student toward disease prevention. This negative attitude toward COVID-19 vaccination may not be unconnected to the conspiracy theories and fear of the unknown, which are usually associated with vaccine acceptance in Nigeria. This is in agreement with a study in Bangladesh among university students, which revealed that most of the students doubt the vaccine's effectiveness, which interrupts them from taking the vaccine willingly (Biswas et al., 2021).

Contrary to this finding, a study among university students in Italy showed that, of the total of 3226 participants studied, 91.9% were keen to receive a COVID-19 vaccination (Gallè et al., 2021). In addition, the study found that most respondents were indifferent to whether there are adequate curing and protecting vaccine and treatment modalities for COVID-19 in Nigeria. This finding is contrary to an earlier study done in Northern Nigeria among medical students, which showed that they had confidence that Nigeria's COVID-19 prevention framework could win the battle against the COVID-19 virus (Inegbenosun et al., 2021). There is a disconnect between the public and the government in Nigeria due to persistent issues bordering on bad governance,

corruption, and poverty. These have affected the people's belief in any government program, including COVID-19 prevention strategies.

Furthermore, the level of practice of COVID-19 prevention was assessed among students. The findings showed that most students studied showed excellent practice in COVID-19 prevention. Most of them indicated that they were committed to washing hands and had a positive attitude towards using proper coughing and sneezing etiquette and wearing face masks regularly. However, the finding revealed that many do not have a positive attitude toward wearing face masks regularly. The finding supports a similar study in Nigeria among students, which showed that most of them had observed wearing a face mask and washing their hands regularly. However, only a few students avoided large gatherings of people (Inegbenosun et al., 2021). In the practice of vaccination, the overwhelming majority have not been vaccinated. This is to be expected, but it poses a significant risk to students in the event of the virus's third wave and the emergence of various dreadful variants in Nigeria. Also, this poor practice toward COVID-19 vaccination will hinder the 40% target set by the Nigerian government to vaccinate its population by the end of 2021 (Federal Ministry of Health, 2020).

Finally, the study sought ways to improve students' knowledge, attitude, and practice toward COVID-19 prevention. The findings showed that the respondents suggested ongoing youth-friendly campaigns, enforcement of prevention guidelines, and provision of adequate facilities and commodities to improve the KAP of students in ESUT. In Italy, the success of COVID 19 prevention among students has been attributed to a good level of awareness about COVID-19 vaccination through practical and strategic communication measures in the universities (Gallè et al., 2021).

Conclusion

Every day, new challenges and expectations on how to contain the global pandemic continue to evolve with unprecedented consequences. It becomes very worrisome that many persons, including students, have not embraced comprehensive prevention measures such as vaccination. Their knowledge, attitude, and practices toward COVID-19 prevention seem artificial. Hence,

there is a need for the authorities to re-strategize their approaches and adopt more youth-friendly interventions that can engage the students effectively to make an informed decision toward COVID-19 prevention.

Recommendations

1. The massive public enlightenment campaigns on the campuses should be employed by the behavior change communication department of the ministry of health using youth social communication channels and content to disseminate correct information about COVID-19 prevention.

2. There is also the need to leverage social media platforms' opportunities to create youth-friendly content that will be used to conduct consistent sensitization on COVID-19 prevention, especially for students.

3. The school authorities should strictly strengthen their enforcement strategies to adhere to COVID-19 prevention guidelines.

4. The government should provide adequate testing and vaccination centers on campuses to enhance access to prevention measures.

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