IMPACT OF SAFETY MEASURES TO BE ADOPTED AMONG SECONDARY SCHOOLS STUDENTS OFFERING BIOLOGY BEYOND COVID-19 PANDEMIC IN OTA LOCAL GOVERNMENT AREA OF OGUN STATE

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Abstract: *This research looks into how health tips (Adequate spacing, good ventilation, use of sanitizer, use of face masks, hand-washing with soap and disinfectants) can help prevent the spread of Covid-19 pandemic, which can positively impact learners' and staffs' health awareness. This study aims to see how safety measures affected Biology students in the post covid-19 era. A descriptive research design of survey type was adopted in the study. The population of the study consisted of One Thousand SSS 2 Students offering Biology in Secondary School in Ota Local Government Area of Ogun State. A sample of One Hundred respondents was randomly selected from Senior Secondary Schools in Ota Local Government Area of Ogun State. One research instrument was used to collect relevant data for the study, it consists of section A and B, section A sought for bio – data and demographic information of the respondents. While section B contained 20 items to elicit response using a four-point Likert Scale of Strongly Agreed (SA=4), Agreed (A=3), Disagreed (D=2), and Strongly Disagreed (SD=1) were the four options available. Face and content validity of the instrument was done by experts in Test and Measurement and Health Education. The reliability of the instrument was determined using Cronbach alpha and a reliability coefficient of 0.85 was obtained. The data collected from the study were analyzed using descriptive statistics. The questions raised were analyzed using descriptive statistics of Frequency Count, Mean and Standard Deviation. The findings of the study revealed that proper precautions could be taken to eradicate or prevent this noble virus's spread while raising health awareness. The study recommended among others that schools should follow NCDC guidelines. Learners, staff, and visitors should also develop the habit of washing their hands frequently with soap and water or using hand sanitizers before entering the school premises.*

Keywords: Safety measures, COVID-19, Tertiary Institution, Biology, health education

INTRODUCTION

Coronaviruses are a type of virus that belongs to the *Corona viridae* family. The coronavirus outbreak has affected all sectors of the country and has been declared a public health emergency of international concern. The first confirmed case in Nigeria occurred on February 27th, 2020, when an Italian national tested positive for the virus at Lagos International Airport , (World Health Organization, 2021). On 9th March, 2020, a citizen contacted the Italian with the virus which brought about the second case of the virus in Ewekoro, Ogun State, Nigeria. It has been reported that direct contact with an infected person's respiratory droplet and touching a virus-infected surface, and then touching one's face can spread the virus (WHO, 2021). Due to the rapid spread of this novel disease, as at March

2020, the Federal Government ordered that all academic activities at all levels of education be halted immediately, not minding the impact on school academics (Adamu, 2020)

To maximize the global spread of this pandemic, the primary concern of government is geared towards the learners' and staff's safety. Biology is a natural science concerned with studying life and living organisms. It is also a core science subject that requires much hands-on learning. However, if appropriate safety measures are implemented before teaching and learning the subject matter, learners and teachers will become conscious of safety measures to be taken to curtail this pandemic. Actions and precautions taken to protect people from danger or other undesirable outcomes are called "safety" or "safety measures." To reduce the risk of illness or death to people and prevent the spread of the Covid-19 virus in the future, the government, educators, and other health organizations must work together to mitigate the pandemic's effect and provide assistance in its management.

Avoiding close physical contact (1m or 3ft), also known as social distancing, is recommended by the World Health Organization (2020) as a means of preventing the spread of this virus. Other recommended preventative measures include: washing hands frequently for at least 20 seconds with soap and running water or using alcohol based hand sanitizer; covering the nose and mouth with a disposable tissue or flexed elbow when coughing or sneezing; covering the eyes, nose, and mouth with Other common preventative measures, such as maintaining good respiratory hygiene, washing hands frequently, and limiting or avoiding travel to and from infected areas unless absolutely necessary, were also emphasised by AbdulAzeez (2020), Atiya and Poorva (2020) and Nnebedum, Obuegbe and nwafor (2021).

More importantly, safety measures should be instilled before teaching and learning biology in secondary schools involving proper safety strategies practiced adequately. This will serve as a guide to reopening schools safely and ensure healthy environment securely for academic activities. Furthermore, educational institutions (technical, colleges, polytechnics and universities) should be better prepared to reopen their doors safely, if these safety measures are implemented. This wide range of solutions would benefit all the students, instructors, and educational staff at all departments of higher educational institutions in Nigeria. When adequate preparation is made prior to teaching and learning activities, the country's risk of global pandemic diseases is reduced (Kebede et al., 2020).

Furthermore, individual institutions should adhere to the NCDC recommendations in order to safeguard their students, staff, and visitors, enabling students to continue their academic activities in a safe and healthy atmosphere. According to Adamu (2020), school reopening will need readiness, enough capacity, and trust that students and staff would be protected from the danger of Covid-19 infection. The strategies used to halt the spread of this pandemic virus are widely seen as a precautionary measure.

The Covid-19 pandemic is a worldwide problem; it impacts all nations and has a detrimental influence on all areas of the economy, including education, harming the teaching and learning activities of Biology students (Maria, 2020). As a result, proper safety precautions should be implemented to minimise the spread of this virus, ensuring the safety of both students and school personnel.

Many issues have arisen throughout the globe as a consequence of the worldwide pandemic, which has affected many sectors, resulting in the loss of many lives and a decrease in economic development, providing a huge dilemma for society (John, 2020). As a response, when safety precautions are put in place, the transmission of Covid-19 is minimized, and students and other stakeholders in the educational sector are always safeguarded. According to John (2020), to prevent the development of this pandemic, health awareness should be instilled through training, seminars, and workshops to orientate and inform individuals on the danger and safety from this deadly virus.

This research aims to determine the impact of safety measures adopted for Biology students in the Ota local government area beyond the Covid-19 pandemic. Therefore, this study assessed the following:

i. investigate the various safety precautions, Biology students should take in the aftermath of the Covid-19 pandemic;
ii. assess the impact of additional safety measures for Biology students beyond the Covid-19 pandemic and;
iii. to see how effective safety measures for students offering Biology in secondary schools has been implemented in the post Covid-19 era .

This study will contribute to knowledge, raise safety awareness, and benefit the government, health sector, and educators by examining the impact of safety measures for Biology students in Senior Secondary School beyond the Covid-19 pandemic.

The following research questions were addressed in this study:

i. what are the various safety precautions taken by Biology students beyond the Covid-19 pandemic?

ii. what are the long-term consequences of these precautionary measures for Biology students after the Covid-19 pandemic?

iii. beyond the Covid-19 pandemic, how can safety measures be effective for Biology students?

METHODOLOGY

A descriptive research design of survey type was adopted in the study. The population of the study consisted of One Thousand SSS 2 Students offering Biology in Secondary School in Ota Local Government Area of Ogun State. A sample of One Hundred respondents was randomly selected from Senior Secondary Schools in Ota Local Government Area of Ogun State. One research instrument was used to collect relevant data for the study, it consists of section A and B, section A sought for bio – data and demographic information of the respondents. While section B contained 20 items to elicit response using a four-point Likert Scale of Strongly Agreed (SA=4), Agreed (A=3), Disagreed (D=2), and Strongly Disagreed (SD=1) were the four options available. Face and content validity of the instrument was done by experts in Test and Measurement and Health Education. The reliability of the instrument was determined using Cronbach alpha and a reliability coefficient of 0.85 was obtained. The data collected from the study were analyzed using descriptive statistics. The questions raised were analyzed using descriptive statistics of Frequency Count, Mean and Standard Deviation.

Decision Rule:

Cut off point (means): $\frac{4+3+2+1}{4} = \frac{10}{4} = 2.50$

Any calculated means greater than cut-off point (mean) = 2.50 should be accepted while the one less should be rejected.

RESULTS

Research Question 1: What are the various safety measures facilities to be adopted for Biology Students beyond COVID-19 pandemic?

Table 1: The various safety measures facilities to be adopted for Biology Students beyond Covid 19 pandemic

S/N	Items	SA	A	D	SD	Total	Mean(x)	Decision
1	Schools should ensure availability and adequacy of classroom learning spaces in line with NCDC guidelines before the teaching and learning of Biology	80	20	-	-	100		
	Weighted mean	320	60	-	-	380	3.8	Agreed
2.	Schools should ensure that adequacy of doors and window to enhance good ventilation before the teaching and learning of Biology	60	40	-	-	100		
	Weighted mean	240	120			360	3.6	Agreed
3	The schools should provide hand sanitizer regularly at the gate for both learners and staff before the teaching and learning of Biology	86	14	-	-	100		
	Weighted mean	344	42	-	-	386	3.86	Agreed
4.	Schools should ensure that learners and staffs to wear face masks at all times while at school before the teaching and learning of Biology	54	46	-	-	100		
	Weighted mean	216	138	-	-	354	3.54	Agreed
5	Schools should ensure adequacy of soap and disinfectants as requirements for washing, to including hand washing, toileting, sanitary and waste disposal before the teaching and learning of Biology	78	22	-	-	100		
	Weighted mean	312	66	-	-	378	3.78	Agreed

Research Question 2: What are the long-term consequences of these precautionary measures for Biology students after the Covid-19 pandemic?

Table 2: The long-term consequences of these safety measures for Biology students beyond Covid 19 pandemic

S/N	Items	SA	A	D	SD	Total	Mean (x)	Decision
6	The safety measures are to ensure maximum possible safety and protection against Covid-19 infection	44	54	2	-	100		
	Weighted mean	176	162	4	-	342	3.42	Agreed
7	The safety measures are to ensure an effective response in case any learner or staffs exhibits symptoms associated with Covid-19 infection.	71	29	-	-	100		
	Weighted mean	284	87	-	-	371	3.71	Agreed
8	The safety measures are to ensure the adoption of health and safety protocols to lower the risk of infection in the school and during lessons	56	44	-	-	100		
	Weighted mean	224	132	-	-	356	3.56	Agreed
9	The safety measures are to ensure reduce of death rate own to Covid-19.	60	40	-	-	100		
	Weighted mean	240	120	-	-	360	3.60	Agreed
10	The safety measures are to ensure health awareness about the novel Covid-19 pandemic	75	25	-	-	100		
	Weighted mean	300	75	-	-	375	3.75	Agreed

Research Question 3: How can safety measure be effective for Biology students in Senior Secondary School beyond COVID 19 pandemic?

Table 3: Effectiveness of safety measure for Biology students in Senior Secondary School beyond Covid 19 pandemic

S/N	Items	SA	A	D	SD	Total	Mean(x)	Decision
11	Online workshop training, seminars on safety measures should be regularly conducted for learners and staff	60	35	5	-	100		
	Weighted mean	240	105	10	-	355	3.55	Agreed
12.	Setting up a school hygiene committee to monitor and promote compliance with this	60	30	10	-	100		

	safety measure							
	Weighted mean	240	90	20	-	370	3.70	Agreed
13	Providing facilities to establish and maintain prescribed hygiene standards to enhance safety measures	60	40	-	-	100		
	Weighted mean	240	120	-	-	360	3.60	Agreed
14	Accurate dissemination of information about Covid-19 enhances effective safety measure.	80	17	2	-	100		
	Weighted mean	320	51	10	-	381	3.81	Agreed
15	By carrying out routine sanitation of premises in schools, safety measure can be effective.	85	10	5		100		
	Weighted mean	340	30	10		380	3.80	Agreed

Discussion

During and after the COVID-19 pandemic, Table 1 had five items on various safety measures facilities adopted schools for Biology students. Items 1 to 5 had mean values of 3.8, 3.6, 3.86, 3.54, and 3.75 respectively, indicating that various safety measures implemented by schools benefited the health of learners and staff of the schools studied. Safety measures such as adequate spacing during lessons, use of well ventilated classroom, use of sanitizer, use of face masks, hand-washing with soap and disinfectants were all to be adopted by Biology students beyond covid-19 era. This safety measures are all part of the precautionary measures recommended by WHO (2020), AbdulAzeez (2020), Atiya and Poorva (2020) and Nnebedum, Obuegbe and nwafor (2021). Although Covid-19 vaccines have been discovered to be helpful in boasting immunity of individual from contacting the disease, the best way to eradicate this pandemic is to implement safety measures to eradicate this novel viral disease. This is an indication that these measures are precautionary, when adhere to by students and teachers they would be over comes the threat posed by viruses and chemicals used during practical works in the laboratory.

Table 2 shows the consequences of these safety measures on Biology students during and after the Covid-19 pandemic. The items considered had mean values of 3.42, 3.71, 3.56, 3.60, and 3.75, which were accepted based on the decision rule. This indicated that the precautionary measures highlighted were at the substantial level of safety and protection against COVID 19 infection and other disease propagated by virus. This align with the opinion of Adamu (2020), Atiya and Poorva (2020) and Kebede et al. (2020) who all at different time revealed that the outbreak of the Covid-19 and viral diseases could be mostly curtailed by adhering to the safety measures rather than searching for the drug to cure such diseases. This is an indication that when the safety measures are adhered to always, individual students and teachers would be protected and live them in the state of wellness, Also, this finding suggests that Biology students could be protected against any viral disease as well as from experiencing or being injured from any form of accident in school, particularly while working in the laboratory.

Items 11,12,13,14, and 15 in Table 3 had mean scores of 3.55, 3.70, 3.60, 3.81, and 3.80,

respectively. These, indicated that safety measures can be effective when sufficient safety precautions are implemented in schools. According to John (2020), to prevent the development of this novel pandemic, health awareness should be instilled through training, seminars, and workshops, all of which will disseminate information about the COVID 19 pandemic and help to slow its global spread.

CONCLUSION

It is concluded from the findings of this study that the enforcement of the safety measures such as adequate spacing during lessons, use of well ventilated classroom, use of sanitizer, use of face masks, hand-washing with soap and disinfectants are the most remarkable techniques that the government and educational authorities could use to safeguard both learners and staff from being affected by the pandemic diseases and providing safety that could address global health issues. It was also concluded that these safety measures are consequential for the wellness and safety of Biology students during and after pandemic. These safety measures were concluded to be necessary for a secure classroom and effective Biology instruction in tertiary institution most especially when in the laboratory.

Recommendations

The following recommendations were made based on the research findings:

- schools should follow and comply with NCDC rules;
- learners, staff, and visitors should practice washing their hands frequently with soap and water or using hand sanitizers before entering the school grounds.
- health awareness campaign on the influence of safety measures in society should be organized through a seminar, conference, or workshop
- The covid-19 precautionary or safety measures should be adopted by students and teachers in the laboratory during practical classes.

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