# Student's Knowledge, Perception and Approaches towards Covid-19 Preventive Measures in PAMO University of Medical Sciences, Port Harcourt, Nigeria

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## Summary

**BACKGROUND**

**In times of a disease pandemic, people's compliance with preventive measures is affected by their knowledge, attitudes, and practices towards the disease. This study was designed to evaluate the knowledge, perception and approaches of medical science students toward Covid-19 preventive measures.**

**MATERIALS AND METHODS**

**This was a cross-sectional survey conducted among 145 medical students of Peter Adaeze Mary Odili (PAMO) University of Medical Sciences, Port Harcourt, Rivers State, Nigeria selected using a convenient sampling technique. A 22-items questionnaire was administered to the participants and retrieved immediately after completion. The data were analyzed using descriptive and inferential statistics on the statistical package for social sciences (SPSS) version 21.0 (IBM Corp, Amornk, NY, 2012) and the level of statistical significance was set at $p < 0.05$.**

**RESULTS**

**Most of the participants 135(93%), knew that Covid-19 is caused by a virus. The majority 142 (98%) agreed that the disease can be transmitted from person to person. The majority of the participants 119(82%), said they were afraid of the vaccine. There were no statistically significant relationships between gender and general knowledge of Covid-19 ($p = 0.073$), or approach to preventive measures ($p = 0.321$). The year of study showed no statistically significant relationships between knowledge of vaccines ($p= 0.074$) and approaches to preventive measures ( $p = 0.431$). There was a statistically significant relationship between the program of study and the knowledge of vaccines ($p = 0.002$) while there were no statistically significant relationships between the program of study and approaches to preventive measures ($p= 0.081$).**

**CONCLUSION**

**There was a statistically significant relationship between the programme of study and the knowledge of the vaccine while there were no statistically significant relationships between the programme of study and general knowledge of Covid-19 and approaches to preventive measures.**

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***Keywords:*** *Covid-19, Knowledge, Students, Vaccine*

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## Introduction

The Covid-19 pandemic spread with the alacrity of a threatening biblical apocalypse, thus creating anxiety and trepidation among the human race. In response to this seemingly unpredictable circumstance, the World Health Organization (WHO) on January 30, 2020, declared the pandemic a Public Health Emergency of International Concern (PHEIC). The WHO further called for collective efforts of all countries of the world to halt the escalation of the Covid-19 pandemic [1]. Covid-19 was first reported in December 2019 in Wuhan, the capital city of Hubei province in central China. Wuhan city is strategically located with an efficient and convenient transportation system to connect all other cities in china and overseas [2], hence the rapid spread of Covid-19 to other countries of the world with attendant destruction of lives and devastation of the global economy.

Covid-19 is a zoonotic disease said to be domicile in bats and was transmitted to humans through wild animals. Human-to-human transmission of Covid-19 occurs via feco-oral and air droplet routes as well as direct contact with contaminated surfaces. It has been documented that the virus may survive for 14 days on some surfaces [3,4]. Community transmission from asymptomatic patients adds to the disease burden. Adults and children can be infected, although the severe illness is common in the elderly and those with co-morbid conditions such as cardiovascular disease, obesity, cancer and diabetes.

To prevent the spread of Covid-19, at the peak of the pandemic, unprecedented measures were adopted by different countries of the world including Nigeria. These measures included promoting basic personal hygiene, such as frequent hand washing with soap and water, and the use of hand sanitisers. Population behaviour restrictions, such as lockdown of cities, border closures, cancellation of public gatherings and closedown of schools were undertaken. Others are individual protection measures such as the use of face masks in public places and public transportation as well as physical distancing[5]. At present, in addition to the extant public health measures to prevent the spread of Covid-19, the vaccine has been developed and is receiving a positive response from the public globally.

In times of a disease pandemic, people's compliance with preventive measures is affected by their knowledge, attitudes and practices towards the disease. Studies conducted in Portugal and Jordan among university students demonstrated positive knowledge and favourable attitude toward Covid-19 preventive behaviour.[5,6] Similarly, a study conducted among Iranian people showed a relatively good level of knowledge, positive attitude and good behaviour concerning Covid-19[7]. University students should be regarded as the most prone population as documented scientific evidence has revealed a high prevalence of health risk behaviour among them [8]. More so, medical science students as emerging healthcare professionals own the power to influence population health. Nonetheless, a lackadaisical attitude toward Covid-19 preventive behaviour can complicate attempts for preventing the prevalence of the disease. This study was designed to evaluate the knowledge, perception and approaches of medical science students toward Covid-19 preventive measures.

## Materials and Method

### *Study design and setting*

This was a prospective cross-sectional survey conducted at the PAMO University of

Medical Sciences Campus, Port Harcourt. Peter Adaeze Mary Odili(PAMO) University, a foremost Private Medical University in Nigeria, recognized locally and worldwide for excellence in health services, medical education and research, is located at No. 1, Tap Road, Elelenwo, Off Aba Expressway, Port-Harcourt, Rivers State, Nigeria [9]**.** The institution offers Medical and Health Sciences programmes, viz., Anatomy, Biochemistry, Physiology, Pharmacology, Nursing Sciences, Medical Laboratory Sciences, Radiography and Radiation Sciences and General Medicine.

## *Study population*

The study population for this research comprised all the students of the faculties of Clinical Sciences, Allied Health Sciences and Basic Medical Sciences that were within the main campus of the University within the period of the study.

## *Ethical consideration*

Ethical approval for this study was obtained from the PAMO University of Medical Sciences. Ethical committee on Human experimentation (PUMS-HREC). The participant's consent was properly sought and obtained appropriately using a written informed consent form. The student's participation in the study was entirely voluntary as their refusal to participate in the study did not have any effect on their academic performance/activities. The obtained information was used only for this study and was held in strict confidence.

## *Sample size and sampling technique*

The sample size used in this study was determined using Yamane [10] formula for the finite population given below.

$$\mathbf{n = N/1+N\ (e)^2}$$

Where; **N (228)** is the population of students obtained from the class attendance registers of the various programmes run by the University, **e** (**5%=0.05**) is the level of acceptable errors and **n** is the desired sample size.

$$n= 228/1+ 228\ (0.05)^2$$

$$n = 145.$$

The participants were recruited using a convenient sampling method, in which they were allowed to fill out the questionnaire at their rate and space of time.

## *Instrument and procedure of data collection*

A modified structured and self-completion 22 items questionnaire designed by the authors in line with the objectives of the study was used for data collection. The questions included in our questionnaire were adopted from a previous study conducted by [11]. The validity of the questionnaire was done using the Index of Item Objective Congruence (IOC) method used by previous studies [12, 13]. The content validity of the questionnaire was assessed by computing the IOC. Based on the index parameters, an IOC score >0.6 was assumed to show excellent content validity. All the scores obtained in this study for all the items of the questionnaire after IOC interpretation was >0.6. The questionnaire was found to have a Cronbach's alpha reliability value of 0.92 for internal consistency. The survey instrument comprised 51 questions, which were divided into six sections: A) Socio-demographic variables, B) general knowledge of Covid-19, C) knowledge of infection/transmission of Covid-19, D) knowledge of prevention of Covid-19, E) perception towards Covid-19 vaccine and F) approach to Covid-19 preventive measures. A Hardcopy version was administered to the respondents by direct issuance. The completed copy of the questionnaire was retrieved immediately after being filled out by the respondents.

The data generated in this study were analysed using the Statistical Package for Social Sciences (SPSS) version 21.0 (IBM Corp,

Amornk, NY, 2012). The data were analysed using descriptive statistics (frequencies and percentages presented in tables) and inferential statistics (Chi-square test). Alpha level was set at less than 0.05.

## Results

### *Descriptive statistics*

The majority 114 (79%) of the participants were females while males accounted for 31(21%). The highest proportion (46%) of the participants were within the age bracket of 16-20 years. Out of 145 participants, the greater number 77(53%) were in the second year of their studies. Those with Bachelor's degrees in Medicine and Surgery were the highest 73 (50%) (Appendix 1).

### *General knowledge of Covid-19*

General knowledge of the participants about Covid-19 evaluated and captured in (Appendix 2) revealed, that most participants 135(93%) knew that Covid-19 is caused by a virus.

***Table 1:***
***Knowledge of Infection/Transmission of Covid-19***

| S/N | Description | Frequency | percentage |
|---|---|---|---|
| a. | Can be transmitted from person to person | | |
| | Yes | 142 | **97.93** |
| | No | – | |
| | Not sure | **3** | **2.07** |
| | **Total** | **145** | **100** |
| b | Can be transmitted by handshake or hugging | | |
| | Yes | 121 | **83.45** |
| | No | 15 | **10.35** |
| | Not sure | 9 | **6.2** |
| | **Total** | **145** | **100** |
| b | It can be transmitted by touching a surface that is contaminated with coronavirus | | |
| | Yes | 109 | **75.17** |
| | No | | |
| | Not sure | **36** | **24.83** |
| | **Total** | **145** | **100** |
| c | It can be transmitted by touching the nose, mouth or eyes with unwashed hands | | |
| | Yes | 125 | **86.21** |
| | No | – | |
| | Not sure | 20 | **13.79** |
| | Total | 145 | **100** |
| d | Asymptomatic Covid-19 patients cannot spread the infection | | |
| | Yes | 15 | **10.35** |
| | No | 89 | **61.38** |
| | Not sure | 41 | **28.27** |
| | **Total** | **145** | **100** |
| e | Do you know that Covid-19 can be reduced by awareness? | | |
| | Yes | 123 | **84.83** |
| | No | – | |
| | Not sure | **22** | **15.17** |
| | **Total** | **145** | **100** |

Out of the total participants, 86(61%) knew that Covid-19 is an air droplet infection and the majority 134(92%) agreed that the treatment for the disease is mainly supportive.

## *Knowledge of infection and transmission of Covid-19*

Participants' response to knowledge of infection and transmission of the disease was captured in table 3 and showed that out of 145 participants, 142 (98%) agreed that the disease can be transmitted from person to person. The majority 121 (83%) of the participants knew it can be transmitted via handshake or hugging, while a greater proportion 123 (85%) agreed that the spread of Covid-19 can be reduced by proper awareness (Table 1).

***Table 2:***
***Participants' Knowledge of Prevention of Covid-19***

| S/N | Description | Frequency | Percentage |
|---|---|---|---|
| a. | The spread of this disease can be prevented? | | |
| | Yes | 134 | **92.41** |
| | No | – | |
| | Not sure | **11** | **7.59** |
| | **Total** | 145 | **100** |
| b | In your opinion, the following can reduce the spread of Covid-19. | | |
| | The use of face masks | | |
| | Restriction of movement through lockdown/stay at home | | |
| | Restriction of crowding through social distancing | | |
| | environmental sanitation | | |
| | All of the above | 145 | **100** |
| | **Total** | 145 | **100** |
| c | Frequent hand washing with running water for at least 20 seconds or use of alcohol-based sanitiser can prevent infection with Covid-19 | | |
| | Yes | 124 | **85.51** |
| | No | 2 | **1.39** |
| | Not sure | **19** | **13.10** |
| | **Total** | 145 | **100** |
| | Avoid crowds such as public transportation, market, hospitals and religious places | | |
| | Yes | 145 | **100** |
| | No | – | |
| | Not sure | – | |
| | **Total** | **145** | **100** |
| d | Avoid touching your face with unwashed hands. | | |
| | Yes | 134 | **92.41** |
| | No | – | |
| | Not sure | **11** | **7.59** |
| | **Total** | **145** | **100** |
| e | Avoid shaking hands and hugging | | |
| | Yes | 122 | **84.14** |
| | No | – | |
| | Not sure | 23 | **15.86** |
| | **Total** | 145 | **100** |

## *Participant's knowledge of prevention of Covid-19*

Table 4 shows the participant's knowledge of the prevention of the disease as follows; 134 (92%) knew that Covid-19 can be prevented. Those that agreed that frequent hand washing with soap and running water for at least 20 seconds or use of alcohol-based sanitiser can prevent infection with Covid-19 were highest at 124 (86%). Out of 145 participants, 132 (91%) disagreed that children and young adults do not need to take measures to prevent the infection. All the participants 145(100%) said they listened to and followed the directives of the National Centre for Disease Control (NCDC)(Table 2).

## *Participants' knowledge of the Covid-19 vaccine*

As shown in table 5, the majority 109 (75%) of the participants agreed that there is a vaccine for the prevention of the disease while 11 (8%) were not sure. A good number 73(50%) of the participants were not sure if the vaccine was available in their school. Out of 145 participants, only 23 (16%) took the vaccine, while the majority 119(82%) of the participants said they were afraid of the vaccine generally. A large proportion (78%) of the participants were afraid of the reaction to the vaccine (Table 3).

## *Participants' approach to Covid-19 preventive measures*

As shown in table 6, out of 145 participants, 133 (92%) avoided handshaking with friends to protect themselves from being infected by the Covid-19 virus. One hundred per cent (145) of the participants agreed they used facemasks when leaving home. All the participants 145 (100%), said they observed social distancing protocol.

***Table 2 cont':***
***Participants' Knowledge of Prevention of Covid-19***

| S/N | Description | Frequency | Percentage |
|---|---|---|---|
| | | | |
| f | Children and young adults do not need to take measures to prevent the infection | | |
| | Yes | 4 | **2.76** |
| | No | 132 | **91.03** |
| | Not sure | **9** | **6.21** |
| | **Total** | 145 | **100** |
| g | A person who has contact with an infected person should be isolated | | |
| | Yes | 127 | **87.59** |
| | No | – | |
| | Not Sure | 18 | **12.41** |
| | **Total** | 145 | **100** |
| h | Isolation and treatment of Covid-19 patients are effective measures to reduce the spread of infection | | |
| | Yes | 131 | **90.35** |
| | No | – | |
| | Not sure | **14** | **9.65** |
| | Total | **145** | **100** |
| i | Listen and follow the directives of the National Centre for Disease Control(NCDC) | | |
| | Yes | 145 | **100** |
| | No | – | |
| | Not sure | – | |
| | **Total** | **145** | **100** |

***Table 3:***
***Participants' Knowledge of Covid-19 Vaccine***

| S/N | Description | Frequency | Percentage |
|---|---|---|---|
| a. | Do you know that there is a vaccine for the prevention of Covid-19? | | |
| | Yes | 109 | **75.17** |
| | No | 25 | **17.24** |
| | Not sure | 11 | **7.59** |
| | **Total** | **145** | **100** |
| b | Is the vaccine available in your school? | | |
| | Yes | 15 | **10.34** |
| | No | 57 | **39.31** |
| | Not sure | 73 | **50.35** |
| | **Total** | 145 | **100** |
| | Have you taken the vaccine? | | |
| | Yes | 23 | **10.84** |
| | No | 89 | **61.38** |
| | Not sure | 33 | **27.78** |
| | **Total** | 145 | **100** |
| c | If not, why have you not taken it? | | |
| | Afraid of the vaccine generally | | |
| | Yes | 119 | **82.10** |
| | No | 18 | **12.41** |
| | Not sure | 8 | **5.45** |
| | **Total** | 145 | **100** |
| d | Vaccine not available in your vicinity | | |
| | Yes | 24 | **16.51** |
| | No | 35 | **24.18** |
| | Not sure | 86 | **59.31** |
| | **Total** | **145** | **100** |
| e | Afraid of reaction | | |
| | Yes | 113 | **77.93** |
| | No | 9 | **6.21** |
| | Not sure | 23 | **15.86** |
| | **Total** | 145 | **100** |
| f | Afraid of getting Covid-19 from the vaccine? | | |
| | Yes | 12 | **8.29** |
| | No | 108 | **74.48** |
| | Not sure | 25 | **17.24** |
| | **Total** | 145 | **100** |
| | Parents warned you not to take? | | |
| | Yes | 56 | **38.62** |
| | No | 58 | **40** |
| | Not sure | 31 | **21.38** |
| | **Total** | 145 | **100** |

The highest proportion 138 (95%) of the participants said they avoided crowded places to protect themselves against the disease infection. One hundred per cent (145) of the participants agreed that they covered their noses with tissue paper when coughing or sneezing. The greater number 123 (85%) of the participants said they cough into their elbows to avoid the spread of the disease (Table 4).

## *Relationships between the socio-demographic variables and Covid-19 responses' outcome*

There were no statistically significant relationships between gender and general knowledge of Covid-19 (p = 0.073), or approach to preventive measures (p = 0.321). The year of study showed no statistically significant relationships between general knowledge (p = 0.061), knowledge of vaccines ( p = 0.074) and approaches to preventive measures ( p = 0.431) (Table5). There was a statistically significant relationship between the programme of study and the knowledge of the vaccine (p = 0.002) while there were no statistically significant relationships between the programme of study and general knowledge of Covid-19 (p = 0.0231) and approaches to preventive measures (p= 0.081) (Table 5).

***Table 4:***
***Participants' Approach to Covid-19 Preventive Measures***

| S/N | Description | Frequency | Percentage |
|---|---|---|---|
| a. | Do you use a face mask when leaving home? | | |
| | Yes | 145 | **100** |
| | No | – | **-** |
| | Not sure | – | **-** |
| | **Total** | 145 | **100** |
| b | Do you stay at home to minimize the possibility of infection? | | |
| | Yes | 122 | |
| | No | 23 | |
| | Not sure | – | **-** |
| | **Total** | 145 | **100** |
| c | Do you avoid hand shaking with friends to protect yourself from Covid-19? | | |
| | Yes | 133 | **84.14** |
| | No | 12 | **15.86** |
| | Not sure | – | **-** |
| | **Total** | 145 | **100** |
| d | Do you avoid touching your face with unwashed hands? | | |
| | Yes | 126 | **87.00** |
| | No | 4 | **2.65** |
| | Not sure | **15** | **10.35** |
| | **Total** | 145 | **100** |
| e | Do you disinfect frequently touched surfaces/objects? | | |
| | Yes | 78 | **53.79** |
| | No | 23 | **15.86** |
| | Not sure | **44** | **30.35** |
| | **Total** | 145 | **100** |
| f | Do you practice social distancing? | | |
| | Yes | 145 | **100** |
| | No | | |
| | Not sure | – | |
| | **Total** | 145 | **100** |

*Table 4 cont':*
*Participants' Approach to Covid-19 Preventive Measures*

| S/N | Description | Frequency | Percentage |
|---|---|---|---|
| g | Do you avoid using other people's phones? | | |
| | Yes | 69 | 47.59 |
| | No | 71 | 48.97 |
| | Not sure | 5 | 3.44 |
| | Total | 145 | 100 |
| h | Do you listen and follow the directives of the local authorities and NCDC? | | |
| | Yes | 134 | 92.41 |
| | No | – | |
| | Not sure | 11 | 7.59 |
| | Total | 145 | 100 |
| i | Do you avoid crowded places to protect yourself from infection? | | |
| | Yes | 138 | 95.17 |
| | No | 1 | 0.69 |
| | Not sure | 6 | 4.14 |
| | Total | 145 | 100 |
| j | Do you cover your nose with a tissue when coughing or sneezing? | | |
| | Yes | 145 | 100 |
| | No | – | |
| | Not sure | – | |
| | Total | 145 | 100 |
| k | Do you wash your hands frequently with running water and soap or use sanitiser? | | |
| | Yes | 128 | 88.28 |
| | No | 2 | 1.37 |
| | Not sure | 15 | 10.35 |
| | Total | 145 | 100 |
| | Do you usually cough into your elbow to avoid the spread of Covid-19? | | |
| | Yes | 123 | 84.83 |
| | No | 4 | 2.76 |
| | Not sure | 18 | 12.41 |
| | Total | 145 | 100 |

*Table 5:*
*The Relationships between Participant's Socio-Demographic Variables and Covid-19 Outcomes*

| Socio-demographic variables | Covid-19 general knowledge | | Knowledge of infection/ Transmission | | Knowledge of vaccine | | Approach to preventive measures | |
|---|---|---|---|---|---|---|---|---|
| | $X^2$ | *P* | $X^2$ | *P* | $X^2$ | *P* | $X^2$ | *P* |
| Gender | 13.121 | 0.073 | 6.531 | 0.085 | 5.941 | 0.241 | 6.432 | 0.324 |
| Level of study | 12.781 | 0.061 | 9.421 | 0.413 | 12.761 | 0.074 | 10.413 | 0.431 |
| Programme of study | 6.172 | 0.231 | 17.621 | 0.061 | 21.410 | 0.002 | 14.121 | 0.081 |
| Age group | 23.265 | 0.051 | 7.214 | 0.436 | 15.614 | 0.024 | 13.414 | 0.063 |

## Discussion

Globally, every facet of society is trying to manage and contain Covid-19 infection. The role of societal awareness in reducing the spread of Covid-19 and its preventive measure against Covid-19 cannot be overemphasized following the pronouncement of Covid-19 as a pandemic by the NCDC [14], which affected all sectors of the economy globally and also impacted the attitude of the participants of our study, the role of government in creating awareness on preventive measures against Covid-19 and by so doing reduce its spread cannot be overemphasized. This is evident in the majority of the participants in this study showing good knowledge of the Covid-19 pandemic, which includes knowledge of the cause of the disease, treatment, and mode of infection/transmission of the disease. These are the main steps for effective preventive measures. . Despite the differences in our absolute values of the respondent's response, our finding is in agreement with the findings of the studies carried out by Olaimal *et al* [6], Alzoubi *et al* [15] and Shahabi *et al* [7], which also reported good general knowledge of the disease by their participants. In Olaimat *et al* [6] study, which was conducted to evaluate attitudes, anxiety and behavioural practices regarding Covid-19 among university students in Jordan, it was reported that an average score of 80.7% on the general knowledge of the disease was recorded. In another study conducted by Alzoubi *et al* [15] in Jordan, among university students, the result showed a high knowledge of Covid-19 (82%). According to Shahabi *et al* [7], 65.8% of the study participants had good knowledge of Covid-19 infections. Also, Huynh *et al* [16] in their study reported that 93.3% of their study participants in Vietnam had acceptable attitudes towards Covid-19. The high level of knowledge about Covid-19 identified in our study could be attributed to the category of the people included in this study which are medical sciences students who had prior knowledge of disease infestation and also have been adequately sensitized to the nature of Covid-19 infection. Shehabi *et al* [7] ascribed this level of knowledge to the high level of education of their participants, which is also in tandem with our study. However, Alzoubi *et al* [15] found that there were no differences in the Covid-19 knowledge between medical and non-medical students in Jordan.

Knowledge of infection/transmission of Covid-19 was also evaluated, and the result revealed that 98% of the participants were knowledgeable of the mode of transmission of the disease, and more than two third of the participants agreed that Covid-19 spread could be reduced by creating awareness. This finding is consistent with the findings of the studies conducted by Chen *et al* [17] and Roy *et al* [18], which also reported similar things.

A greater proportion of the participants in the present study population displayed positive attitudes toward individual preventive measures of Covid-19. This finding is in harmony with the findings of similar studies carried out by Alzoubi *et al* [15], Asaad *et al* [19], Masheshivari *et al*[20], and Bokadia and Ganapathy [21], who also reported significant positive attitude of participants toward Covid-19. According to McEachman *et al* [22], attitude is a predictor of behavioural infection, while the infection is considered an indicator of behaviour. The main resultant effect of negative attitudes toward Covid-19 is feeling shame, which normally leads to an increasing rate of the epidemic [7]. This negative attitude according to Abdethafiz *et al* [23], can be eradicated by education and a clearly defined policy in the healthcare sector.

Our participants' knowledge of the Covid-19 vaccine was assessed, and findings show that the highest percentage of the participants knew that there was a Covid-19

vaccine. Although, the majority of the participants were unaware of the availability of the vaccine in their universities. A large proportion of participants did not take the vaccine at the time of this study, as the majorities were afraid of the possible side effects of the vaccine.

The participant's approaches to Covid-19 preventive measures were evaluated. Results showed a high prevalence of good precautionary measures among the participants. The participants strictly observed preventive measures such as avoiding handshakes, avoiding crowded places, practising the use of a face mask, practising social distancing, regular washing of hands with alcohol-based sanitiser and coughing into their elbows. These findings may be ascribed to the level of knowledge among participants about Covid-19, especially being students of the University of Medical Sciences.

The finding is inconsistent with the findings reported in the studies conducted by Olaimat *et al* [6] and Abate and Mekomen[24], which reported a prevalence of poor precautionary measures among the participants in their studies. In Olaimat *et al* [6] study, a greater number (60.2%) of their participants did not wear face masks when going out. Abate and Mekonnen's [24] study, reported that 39% of the participants, were hospital visitors taking precautionary measures against Covid-19. The discrepancies in the present findings could be ascribed to the following factors; the nature of the participants recruited in the various studies, the inconsistent recommendation regarding some of the precautionary measures and the application of the recommended Covid-19 preventive measure among our participants. According to WHO [25], Healthy individuals should wear face masks when taking care of those infected with Covid-19

Our result revealed that there were no statistically significant relationships between the participant's age group, gender, year of study and level of study and knowledge of infection/transmission, approaches to preventive measures and the knowledge of the Covid-19 vaccine, with exception of the programme of a study showing statistical significant relationship with the knowledge of the vaccine. These findings showed that knowledge of the various components of the questions was not influenced by the participant's gender, age, year of study and even their level of study. However, their knowledge of the vaccine was influenced by their programme of study. Perhaps this is because some participants studying pharmacology, medical laboratory sciences and medicine were more knowledgeable about vaccines than those in radiography, anatomy and physiology. The number of students in the medicine and surgery programme who participated in this study may also be a contributive factor. These findings are inconsistent with some of the findings of the previous study conducted by Olaimat *et al*[6] in Jordan. Olaimat *et al* [6] in their study conducted to evaluate attitude, anxiety, and behavioural practices regarding Covid-19 among university students in Jordan reported that there was a statistically significant relationship between behavioural practice towards Covid-19 and sociodemographic variables such as overall age ($p = 0.007$), gender ($p = 0.000$) programme of study ($p = 0.005$). The discrepancies in our findings could be attributed to the nature of the participants included in the different studies. In our study, the participants were medical students who are knowledgeable of Covid-19 infection while the participants in Olaimat *et al* [6] study were drawn from medical sciences engineering, Agricultural and general science and Human sciences. The different sample sizes employed in

the respective studies could also account for the differences in our findings.

## Limitations

This study was only carried out at one University of Medical Sciences; therefore, the findings of this study cannot be generalized to all students in Nigeria.

## Conclusion

The majority of the participants agreed that the disease can be transmitted from person to person and that the spread of Covid-19 can be reduced by proper awareness. Those that agreed that frequent hand washing with soap and running water for at least 20 seconds or use of alcohol-based sanitiser can prevent infection with Covid-19 were highest. A large proportion of the participants disagreed that children and young adults do not need to take measures to prevent the infection One hundred per cent (145) of the participants agreed that they covered their noses with tissue paper when coughing or sneezing.

There were no statistically significant relationships between gender and general knowledge of Covid-19, or approach to preventive measures. The year of study showed no statistically significant relationships between general knowledge, knowledge of vaccines and approaches to preventive measures. There was a statistically significant relationship between the programme of study and the knowledge of the vaccine while there were no statistically significant relationships between the programme of study and general knowledge of Covid-19 and approaches to preventive measures.

## Recommendation

The findings of this study should be used in health policy making especially as it affects the attitude and behaviour of students towards infectious diseases.

**Availability of data and material**

The datasets used or analyzed during the current study are available from the corresponding author upon reasonable request.

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**Authors' contributions**

All authors have read and approved the manuscript. Each author participated sufficiently in this submission and the roles of the authors are: MPO, ANM, IAO, JCE and EBM were the main researchers, drafted the manuscript, responsible for data capturing presentation of results, and interpretation of results. EAO, OEE and EO gave recommendations on the review of literature, helped in data analysis and also provide critical comments on the research work.

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**Appendix 1**

***Descriptive statistics of the socio-demographic variables of the respondents***

| S/N | Description | Frequency | Percentage |
|---|---|---|---|
| 1 | **Age** | | |
| | 15 years | **-** | |
| | 16-20 | 67 | **46.21** |
| | 21-25 | 42 | **28.97** |
| | 26-30 | 29 | **20** |
| | 31-35 | 7 | **4.82** |
| | 36 years | - | |
| | **Total** | 145 | **100** |
| 2 | **Gender** | | |
| | Male | 31 | **21** |
| | Female | 114 | **79** |
| | **Total** | 145 | **100** |
| 3 | **Class** | | |
| | Year 1 | 39 | **26.90** |
| | Year 2 | 77 | **53.10** |
| | Year3 | 11 | **7.59** |
| | Year 4 | 18 | **12.41** |
| | **Total** | 145 | **100** |
| 4 | **Programme of Study** | | |
| | Anatomy | 12 | **8.28** |
| | Biochemistry | 9 | **6.21** |
| | Medical Laboratory Sciences | 23 | **15.86** |
| | Medicine and Surgery | 73 | **50.35** |
| | Pharmacology | 13 | **8.97** |
| | Physiology | 10 | **6.90** |
| | Radiography | 5 | **3.43** |
| | **Total** | 145 | **100** |

**Appendix 2:** ***The participant's general knowledge of Covid-19***

| S/N | Description | Frequency | percentage |
|---|---|---|---|
| a. | Covid-19 is caused by a virus | | |
| | Yes | 135 | **93.1** |
| | No | – | |
| | Not sure | 10 | **6.9** |
| | **Total** | 145 | **100** |
| B | Covid-19 started in China | | |
| | Yes | 123 | **84.83** |
| | No | – | |
| | Not sure | 22 | **15.17** |
| | **Total** | 145 | **100** |
| C | Is an air droplet infection | | |
| | Yes | 89 | **61.38** |
| | No | 15 | **10.32** |
| | Not sure | 41 | **28.30** |
| | **Total** | 145 | **100** |
| D | Cough, fever, breathlessness, and anosmia could be symptoms of Covid-19 | | |
| | Yes | 129 | **88.97** |
| | No | – | |
| | Not sure | 16 | **11.03** |
| | **Total** | 145 | **100** |
| E | Can be confirmed with a laboratory test | | |
| | Yes | 137 | **94.48** |
| | No | – | |
| | Not sure | **8** | **5.52** |
| | **Total** | 145 | **100** |
| | Can be transmitted from person to person | | |
| | Yes | 139 | **95.86** |
| | No | – | |
| | Not sure | 6 | **4.14** |
| F | Once infected death is imminent | 145 | **100** |
| | Yes | 23 | **15.86** |
| | No | 87 | **60** |
| | Not sure | 35 | **24.14** |
| | **Total** | 145 | **100** |
| G | Treatment for Covid-19 is mainly supportive | | |
| | Yes | 134 | **92.41** |
| | No | 1 | **0.69** |
| | Not sure | 10 | **6.90** |
| | **Total** | 145 | **100** |
| H | Not all people with Covid-19 will develop severe illness | | |
| | Yes | 108 | **74.48** |
| | No | 12 | **8.28** |
| | Not sure | 25 | **17.24** |
| | **Total** | 145 | **100** |
| I | Covid-19 commonly causes severe illness in the elderly and those with chronic diseases | | |
| | Yes | 128 | **88.28** |
| | No | – | |
| | Not sure | 17 | **11.72** |
| | Total | 145 | **100** |