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## TABLE OF CONTENTS

GENERAL INFORMATION	1C
INFORMATION FOR AUTHORS	1F
EDITORIAL NOTES .....	107
<b>ORIGINAL ARTICLES</b>	
<b>A Five-Year Review of Laparoscopic Gynaecological Surgeries in a Private-Owned Teaching Hospital, in Nigeria .....</b>	<b>111</b>
J. O. Imaralu, I. F. Ani, C. E. Onuoha, E. O. Grillo, F. A. Oguntade, C. C. Nwankpa	
<b>Adolescent Obesity and its Association with Socio-Demographic Profile, Lifestyle Factors, Dietary and Physical Activity Patterns; Findings from Southwestern Nigeria .....</b>	<b>119</b>
A. A. Adeomi, M. D. Olodu, R. O. Akande, S. Yaya, A. Adediti, R. Ajibade	
<b>Association between Height and Blood Pressure in Middle Age and Older Adults in Southeast Nigeria .....</b>	<b>127</b>
I. I. Chukwuonye, O. S. Ogah, U. U. Onyeonoro, E. N. Anyabolu, I. U. Ezeani, A. U. Ukegbu, U. Onwuchekwa, E. C. Obi, K. A. Ohagwu, O. O. Madukwe, I. G. Okpechi	
<b>Central Nervous System Pathology in Children: A Single-Institution Experience in South-South Nigeria .....</b>	<b>134</b>
M. O. Udoh	
<b>Comparison of the Ivermectin and Lopinavir/Ritonavir Treatment Outcomes among COVID-19 Mild to Moderate Cases in Kaduna State.....</b>	<b>140</b>
A. Oyefabi, S. Musa, H. Kambai, I. Usman, J. Gwamna, J. Sheyin, O. Ige, M. Abdullahi, J. Sunday, H. N. Kera, A. Atiku, H. Dauda, G. C. Umeh, T. Olasinde, A. Abdullahi	
<b>Drugs of Abuse among In-Patients Receiving Treatment for Substance Use Disorders in a Tertiary Health Care Center in South-South Nigeria: An Exploratory Qualitative Study .....</b>	<b>147</b>
C. J. Okafor, E. A. Essien, B. E. Edet, A. C. Okoro, O. Udofia	
<b>Heavy Malaria Parasitaemia in Young Nigerian Infants: Prevalence, Determinants and Implication for the Health System</b>	<b>154</b>
O. F. Folarin, B. P. Kuti, A. O. Oyelami	
<b>Mortality Pattern in Surgical Wards in Northwestern Nigeria: A Single-Center Study.....</b>	<b>162</b>
K. E. Amaefule, F. S. Ejagwulu, I. L. Dahiru, M. O. Ogirima, A. I. Aniko, J.O Njoku	
<b>Preparedness and Perception on Virtual Learning during the COVID-19 Pandemic amongst Students of the Ekiti State University, Nigeria .....</b>	<b>170</b>
A. O. Adeoti, A. Fadeyi, K. S. Oluwadiya	
<b>Presentation and Management Outcomes of Goitres at a District Hospital in Abuja, North Central Nigeria: A 15-Year-Review</b>	<b>176</b>
M. E. Aghahowa, H. C. Onyegbutulem, O. S. Basse, S. N. Esomonu, K. N. Ezike, R. M. Nwokorie, A. Ahmadu	
<b>Prevalence, Pattern and Predictors of Elder Abuse in Benin City, Edo State, Nigeria: An Urban and Rural Comparison .....</b>	<b>183</b>
O. H. Okojie, V. O. Omuemu, J. I. Uhunwangho	
<b>The Efficacy of Local Infiltration Analgesia in the Control of Post-Operative Pain after Total Joint Replacement Surgeries</b>	<b>193</b>
D. E. Ubiomo, U. E. Anyaehie, G. O. Eyichukwu, C. B. Eze	
<b>The Prognostic Significance of the Size of Primary Malignant Breast Tumour in Ghanaian Women: A Retrospective Histopathological Review (2001–2014) in the Department of Pathology, Korle-Bu Teaching Hospital (KBTH) .....</b>	<b>198</b>
E. M. Der	
<b>CASE REPORTS</b>	
<b>High Intensity Focused Ultrasound Treatment for Uterine Fibroid in a Nigerian Hospital: A Case Report and Review of Literature .....</b>	<b>204</b>
A. B. Ajayi, V. D. Ajayi, A. Njoku, O. Oyetunji, B. M. Afolabi	
<b>Pulmonary Embolism: The Battle to Save Life in a Resource Poor Setting .....</b>	<b>208</b>
G. C. Mbata, C. O. U. Eke, L. E. Okoli	
<b>INDEX TO VOLUME 39, NO. 2, 2022</b>	
<b>Author Index .....</b>	<b>212</b>
<b>Subject Index .....</b>	<b>213</b>



### Preparedness and Perception on Virtual Learning during the COVID-19 Pandemic amongst Students of the Ekiti State University, Nigeria

*Préparation et Perception de l'Apprentissage Virtuel Pendant le COVID-19 Pandémie par des Étudiants de l'Université d'État d'Ekiti, Nigéria*

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#### ABSTRACT

**BACKGROUND:** The advent of COVID-19 pandemic affected education which necessitated rapid adjustments and reorganizations in the approach to learning. This study examined undergraduate students' perception on the pandemic and its effect on medical education.

**METHODS AND MATERIALS:** A cross-sectional online questionnaire-based survey of students in the College of Medicine, Ekiti State University, Ado-Ekiti, Nigeria. A google form, free open-source software survey tool, was used to collect data on different domains like socio-demographic characteristics, preparedness and disposition to virtual learning in pandemic, risk perception, and knowledge on COVID-19.

**RESULTS:** A total of 568 participants took the survey with 311 (54.8%) females and a median age of 20 (IQR: 18-22) years. Four hundred and eighty-two (84.9%) of the students had regular access to the Internet, 57 (10%) have occasional access while 29 (5.1%) had no access. Three hundred and fifteen (56%) of the students agreed that their digital and online skills will be better after the pandemic. All the students were aware of the pandemic however, 441 (77.6%) students were aware of the pandemic through the social media, 79 (13.9%) through television and newspapers and 32(5.6%) through family and friends while only 4 (0.7%) became aware of the pandemic through healthcare workers. The median risk perception score for COVID-19 was 24 (IQR: 19-29).

**CONCLUSION:** The study participants were ill-disposed to virtual learning recommended during the pandemics and had a low-risk perception of COVID-19. Hence, there is an urgent need for continuous education on the benefits of virtual learning beyond the COVID-19 pandemics and the need to adopt proactive measures in anticipation of future outbreaks of other infectious diseases. **WAJM 2022; 39(2): 170–175.**

**Keywords:** COVID-19, preparedness, students, virtual learning, perception, Nigeria.

#### RÉSUMÉ

**CONTEXTE:** L'avènement de la pandémie de COVID-19 a été affecté l'éducation qui nécessitait des ajustements rapides et réorganisations de l'approche de l'apprentissage. Cette étude a examiné la perception des étudiants de premier cycle sur la pandémie et ses effets sur l'éducation médicale.

**MÉTHODES ET MATÉRIAUX:** Une coupe transversale en ligne enquête par questionnaire auprès des étudiants du Collège des Médecine, Université d'État d'Ekiti, Ado-Ekiti, Nigéria. Un googleform, outil d'enquête gratuit en logiciel open source, a été utilisé pour collecter données sur différents domaines comme la sociodémographique caractéristiques, préparation et disposition à l'apprentissage virtuel dans la pandémie, la perception des risques et les connaissances sur la COVID-19.

**RÉSULTATS:** Un total de 568 participants ont répondu à l'enquête avec 311(54,8 %) femmes et âge médian de 20 ans (IQR : 18-22 ans). Quatre cent quatre-vingt-deux (84,9 %) des élèves avaient des accès à Internet, 57 (10 %) y ont accès occasionnellement alors qu'ils 29 (5,1 %) n'y avaient pas accès. Trois cent quinze (56 %) des étudiants ont convenu que leurs compétences numériques et en ligne seront mieux après la pandémie. Tous les étudiants étaient au courant de la pandémie toutefois, 441 (77,6 %) élèves étaient au courant de la pandémie par les médias sociaux, 79 (13,9 %) par l'intermédiaire de la télévision et les journaux et 32 (5,6 %) par l'entremise de la famille et amis alors que seulement 4 (0,7 %) ont pris conscience de la pandémie par l'intermédiaire des travailleurs de la santé. Le score médian de perception du risque pour la COVID-19 était de 24 (IQR: 19-29).

**CONCLUSION:** Les participants à l'étude étaient mal disposés à apprentissage virtuel recommandé pendant les pandémies et a eu un perception à faible risque de la COVID-19. Par conséquent, il y a une urgence besoin de formation continue sur les avantages de l'apprentissage virtuel au-delà des pandémies de COVID-19 et de la nécessité d'adopter des mesures proactives en prévision de futures flambées d'autres maladies infectieuses. **WAJM 2022; 39(2): 170–175.**

**Mots-clés:** COVID-19, préparation, étudiants, apprentissage virtuel, perception, Nigéria.

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## INTRODUCTION

Pandemics are multifaceted in manifestation which oftentimes are not restricted to public health challenges but interface global economic crisis, food shortage, and educational setbacks across nations.<sup>1</sup> On the 31<sup>st</sup> of December 2019, the World Health Organization (WHO) called global attention to the outbreak of a pneumonia caused by a virus which originated at Wuhan, China.<sup>2</sup> The rapid transmission of the virus, SARS-CoV-2, was aided by globalization and it was subsequently declared by the WHO as a pandemic on the 11<sup>th</sup> of March 2020.<sup>3</sup> The first case of COVID-19 in Nigeria was confirmed by the Ministry of Health (MOH)/Nigeria Center for Disease Control (NCDC) on the 27<sup>th</sup> of February 2020 in an Italian national who visited the country.<sup>4</sup>

COVID-19 cases have been diagnosed in over 200 countries including Nigeria, hence stringent measures to minimize physical contact like total lockdown and closure of educational institutions were enforced by the affected countries in order to curtail its transmission.<sup>5</sup> Most countries switched from on-site to virtual learning which could be challenging for nations unprepared for e-learning.<sup>6</sup>

With the emerging and re-emerging infectious diseases, there was a need to revisit the old tradition of learning in medical schools. Globally, most of the medical schools introduced modern online methods of learning using teleconferencing applications to teaching during the pandemic.<sup>7</sup> Medical schools in developed countries continued weekly conferences using technological platforms such as Zoom and Microsoft Teams.<sup>8</sup> Singh, *et al.*, also indicated that Indian medical schools rapidly switched to G suite for educational platform using Google Classroom and Google meet for video conferencing.<sup>9</sup>

However, learning management system (LMS) was an uncommon area to most Nigerian students and lecturers, who were used to physical interactions between lecturers, students, and patients, as very few institutions had functional e-learning platforms. These deficiencies became obvious during the

COVID-19 pandemic as the few Nigerian universities operating e-learning platforms were using it mostly for basic activities like uploading documents on the portal and interaction for distance learning programmes.<sup>10</sup> According to Oye, *et al.*, virtual learning in Nigeria is challenged by lack of information and communications technology (ICT) implementation, curriculum overload, lack of learning support materials and insufficient training.<sup>11</sup> This challenge was further compounded by the inaccessibility to free internet and technological tools such as laptops, tablets and smartphones. Furthermore, most Nigerian libraries were also slow to adopt electronic libraries which has immensely contributed to the failure of virtual learning in Nigeria.<sup>10,12,13</sup> The pandemic revealed the gaps and the unmet needs in the educational sector. Hence, this study aimed at assessing the perception of medical students of Ekiti State University, Ado-Ekiti on the pandemic. To determine their level of preparedness for the pandemic and effect of COVID-19 pandemic on medical education as well as their concerns about virtual learning.

## METHODS

### Study Design

A cross-sectional study using an online questionnaire administration survey of the students in the College of Medicine, Ekiti State University, Ado-Ekiti, Nigeria. Medical, nursing, physiology, and anatomy students in the College of Medicine were invited to take part in the study through social media platforms.

### Sample Size

There are 1250 students in the College, and a minimum sample size of 550 was calculated based on 95% Confidence Level, 3% margin of error and 50% population variance using the Raosoft formula for the calculation of the sample size.<sup>14</sup>

### Sampling Technique

A purposive non-probability sampling technique was adopted for this study. A google form, free open-source software survey tool, was designed and structured questionnaire was used to

collect data on the different domains like socio-demographic characteristics, novel learning strategies in pandemic, risk perception, and knowledge on COVID-19. It also included sections on COVID-19 preventive measures that the students have used, trust in sources of COVID-19 information and assessment of the preparedness of various arms of government for the pandemic. The questionnaire was adopted and prepared by the researchers from previous observational studies and systematic review on the subject.<sup>5,9,11</sup> It was pretested among students in the state-owned school of nursing to ascertain clarity of the requested information. All students in the medical college of the Ekiti State University, Ado-Ekiti were given the opportunity to participate in the survey. The questionnaire was sent to the students through their association's social media platform and class WhatsApp groups. The survey lasted five weeks between August 30, 2020, and October 7, 2020. Respondents were informed of the confidentiality of study and freedom to withdraw at any stage from the survey. The questionnaire took approximately 10 to 15 minutes to complete.

### Data Analysis

The various sections of the questionnaire were scored as follows:- Total Knowledge Score (TKS): Each of the seven items on the knowledge scale was given a score of 1. The obtainable range was 0–7 with the lowest score of 0 and the highest score of 7.

*Preventive Measures Score (PMS):* This scale had 17 items where eleven of them are measures recommended by the WHO and the Nigeria Center for Disease Control (NCDC) and the remaining 5 items are normal healthy habit measures. When a participant answers “yes” to a recommended item, he/she is scored 1 and 0 for any other answers. The 5 normal healthy habit items were not scored. Therefore, the maximum score obtainable in this section is 11, and the minimum is zero.

*Risk Perception Score (RPS):* The risk perception scale has seven survey items assessed using a 5-point Likert Scale: strongly disagree, disagree,

neutral, agree, and strongly agree. The score starts from 1 for strongly disagree to 5 for strongly agreed. The Risk perception score for each patient was the sum of all eight item scores and the maximum obtainable score was 40.

The normality of both measures was tested using Kolmogorov-Smirnov test of normalcy. The basic univariate structure was explored using frequencies, means or medians. The relationship between categorical variables were explored using chi-square and Kruskal Wallis test. The threshold for significance was a p-value of 0.05. The Google form data was downloaded as a Microsoft Excel document and imported into IBM-SPSS Version 25 for analysis.

**Ethical Approval**

The study was approved by the Ethical Review Committee of Ekiti State University Teaching Hospital, Ado-Ekiti, Ekiti State, Nigeria.

**RESULTS**

A total of 568 participants took the survey with 311 (54.8%) females and a median age of 20 (IQR: 18–22) years. Median duration of 2 (IQR: 1–3) years in school who were admitted into four programmes in the College of Medicine, where most of the students were in the non-clinical classes (Table 1).

**Table 1: Participants’ Academic Distribution**

	N	%
<b>Course of Study</b>		
BSc. Anatomy	186	32.7
BSc. Physiology	113	19.9
BNSc. Nursing Science	80	14.1
MBBS	189	33.3
<b>Level</b>		
100L	197	34.7
200L	183	32.2
300L	92	16.2
400L	47	8.3
500L	25	4.4
600L	24	4.2
<b>Clinical/Nonclinical</b>		
Non clinical	460	81
Clinical (MBBS)	95	19

**Students’ Preparedness and Disposition to Virtual Learning**

Four hundred and eighty-two (84.9%) of the students had regular access to the internet, 57 (10%) have occasional access while 29 (5.1%) had no access to the internet. Three hundred and twenty-four (57%) exclusively access the internet through the smartphone, while the remainder accessed the internet through a combination of smartphones, laptops, and tablets.

Three hundred and six (53.8%) of the respondents were conversant with the Zoom platform, a further 161 (28.3%) have used Smart School, an independent LMS provider available in the College of Medicine while 494 (87%) have used a wide range of platforms including Google Classroom, WhatsApp, Moodle and Canvas.

Three hundred and fifty-four (62.3%) agreed with the closure of schools during the lockdown while 156 (27.5%) did not and 58 (10.2%) were undecided about the closure. Three hundred and sixty-four (64.1%) preferred the schools commenced online lecture during the lockdown while 125 (22%) disagreed with online lectures and others 79 (13.9%) were indifferent.

Although, the majority 385 (67.8%) would not like the lectures to remain online after the pandemic, three hundred and fifteen (56%) of the students felt that their digital and online skills will be better after the pandemic. In addition, 253 (44.3%) felt that the mode of lecture delivery will be modified after the pandemic and that online lecture delivery has come to stay.

**Students’ Knowledge of COVID-19 Pandemic**

All the students were aware of the pandemic. Four hundred and forty-one (77.6%) students first became aware of the pandemic through the social media, 79 (13.9%) through Television and newspapers and 32(5.6%) through family and friends. Just 4 (0.7%) became aware of the pandemic through healthcare workers.

Most 386 (68.0%) rated their knowledge of COVID-19 as good/very good, while only 13 (2.3%) rated it as poor/very poor. The average TKS was

4.1 (CI: 4.0–4.2). The TKS increased from 3.6 (CI: 3.0–4.3) in those who reported their knowledge base as poor, to 4.0 (CI: 3.8-4.2) in those with average knowledge and 4.2 (CI: 4.1–4.3) among those with good knowledge. Expectedly, the TKS was higher among the clinical students 5.4, (CI:5.2–5.7) than among non-clinicals 3.8 (CI:3.7–3.9).

**COVID-Preventive Measures**

The students were highly compliant with all the recommended COVID-19 preventive measures (Figure 1). The funnel chart shows that the performance of the students on all the recommended COVID-19 avoidance guidelines are higher than their performances on guidelines for general hygiene. The median score on the PMS was 10 (IQR: 9–11).

**Students’ Perception on Institutional (Government/ Hospital) COVID-19 Pandemic Preparedness**

Only 11.4% of the students believed the University Health Centre was prepared for the outbreak. Table 2 shows that other health institutions and arms of the governments did not fare better in the opinion of the students.

**Table 2: Participants’ Perception on the Level of Pandemic Preparedness of Hospitals and the Governments**

Health/Government Institution	N	(%)
The University Health Centre	65	11.4
Ekiti State University Teaching Hospital	150	26.4
Ekiti State Government	183	32.2
The Federal Government of Nigeria	152	26.8

**Students’ Risk Perception of COVID-19 Infection and Trust in the Sources of Information**

Figure 2 shows a tornado chart comparing the agreed and disagreed responses to the eight-item risk perception questions. The risk perception was generally low, it is especially low for

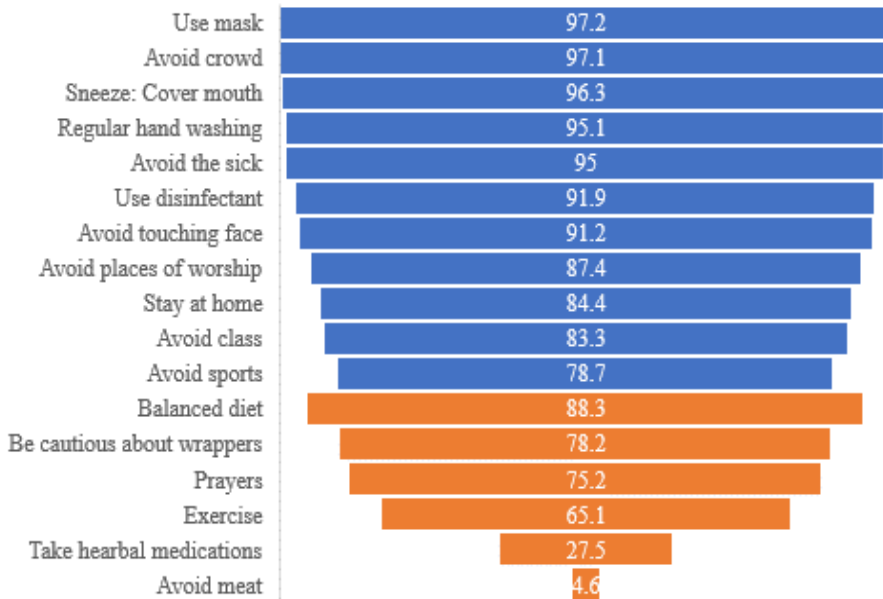


Fig. 1: Funnel Chart showing COVID-19 Preventive Measures taken by Students.

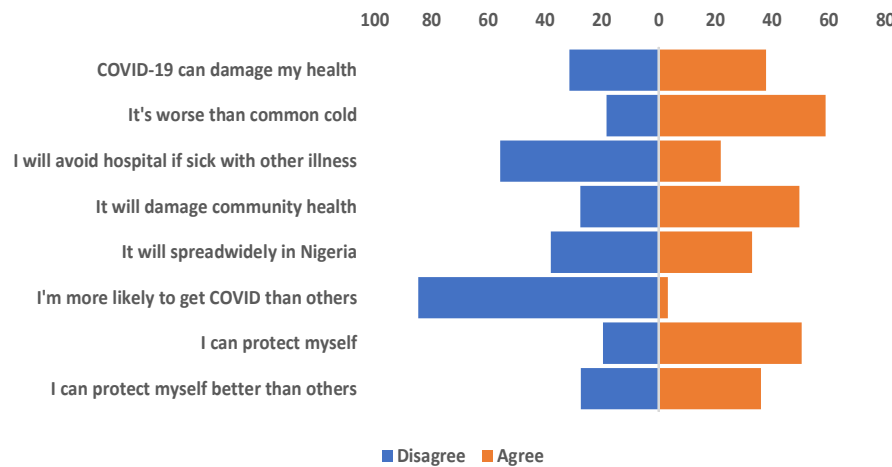


Fig. 2: Tornado Chart comparing the Negative and Positive Responses to the Risk Perception Items.

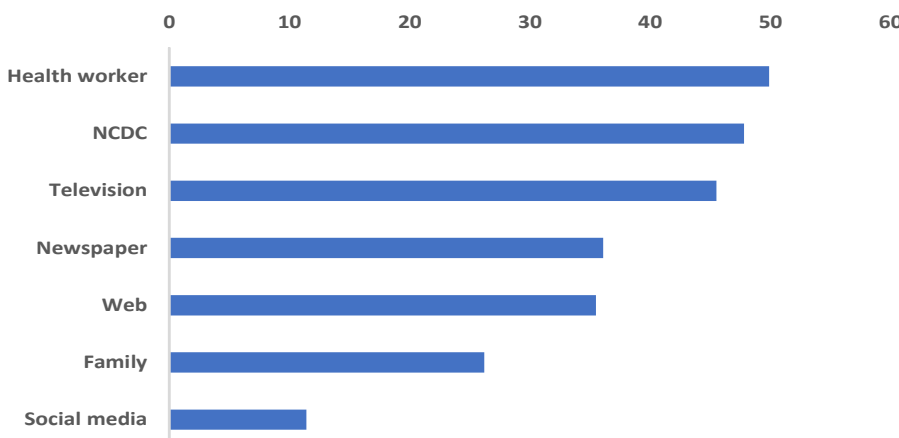


Fig. 3: Study Participants' Trust in the Sources of Information.

“Even if I fall ill with another disease, I will not go to hospital because of risk of getting novel coronavirus/COVID-19 in the hospital”, and “I’m more likely to get COVID-19 than others”. The median risk perception score for COVID-19 was 24 (IQR: 19–29).

As Figure 3 shows, the trust in the sources of information is generally low as even the source with the highest trust rating, health workers failed to break the 50% barrier. The social media has the poorest rating with just a little above 10% of the students trusting its reliability.

**DISCUSSION**

This study showed most of the respondents agreed with the closure of schools during the pandemic but were averse to the permanent implementation of online teaching. The students demonstrated high median knowledge scores on COVID-19 preventive measures but showed a low median risk perception on COVID-19.

In this study, majority of the respondents were receptive to online teaching due to the prevailing circumstance but would still prefer reversal to physical training after the pandemic. The preference for physical training may connote resistance to change but could be related to the need for power supply and internet data which may not be readily available. Similar study reported that 70% students were in support of the adaptation of e-learning during the COVID-19 pandemic.<sup>15</sup> This finding is understandable as the pandemic is novel with an associated exponential increase in morbidity and mortality especially due to the viral mutation and emergence of variant strains. Furthermore, the non-availability of standard medication for the treatment of COVID-19 patients aside from the adherence to the non-pharmacological approaches of physical distancing to contain the spread of the disease poses a threat.

Likewise, the majority of the students did not want online learning to be permanently incorporated into the Nigerian education system. A study from Nepal also reported similar finding where the students disagreed with the complete adoption of online learning into their

educational system.<sup>16</sup> This could be due to the high cost and poor internet services in low-and-middle countries (LMICs). In contrast to physical learning, electronic learning requires technological gadgets like iPad, smartphones, personal computers and constant access to good internet connection which could greatly influence students' motivation towards e-learning due to the procurement cost.<sup>17</sup>

In the study, most of the study participants connected to the internet via smartphones. For clarity and easier communication, laptops should have been preferred to smartphones. However, the use of smartphones in this study is understandable as it has been reported that cellular connectivity and smartphone usage is most prevalent in sub-Saharan Africa as the smartphones can serve dual roles of mobile voice and text communications.<sup>18</sup> Similar studies reported that the study participants connected to the e-learning platforms using their mobile phones.<sup>16,19,20</sup> This preference of mobile phones for e-learning processes could be due to its user-friendly interface and portability of the smartphones.<sup>21,22</sup>

In this study, the social media was the major source of COVID-19 information. This finding is similar to a study that reported students' dependence on the social media for the initial source of COVID-19 information.<sup>23</sup> This could be due to the novelty in the virus as there were few reports in the scientific literature at the onset of the pandemic. However, the students also stated that social media is the least trusted source of COVID-19 information which was in-line with other COVID-19 related studies where the social media was also the most prevalent source of COVID-19 misinformation.<sup>24-26</sup>

There was a high median knowledge score on COVID-19 among the respondents. This may be due to the high literary and educational exposure in Ekiti state compared to the other states in Nigeria. Such finding ordinarily should make respondents better armed in taking informed decision in adopting and complying with preventive measures against COVID-19. Similar findings were reported in studies from China, Iran, and Palestine amongst medical students<sup>27-29</sup>

which was in contrast to an Indian study which revealed that students studying health-related courses showed low – moderate knowledge on COVID-19 especially in areas related to the origin of COVID-19, mode of transmissions and symptoms indicative of disease severity.<sup>30</sup>

In contrast to the high median knowledge score, the study participants had a low-risk perception towards COVID-19. These findings are in contrast to studies on the risk perception of medical students from different nations including Iran, India, Egypt and Jordan.<sup>23,27,31,32</sup> This could be as a result of the low mortality cases reported in the Ekiti State relative to other states in Nigeria. On the contrary, another study in Nigeria among the veterinary students reported high risk perception amongst students studying health-related courses.<sup>33</sup> This high-risk perception among the veterinary students could be explained by the early exposure in their training to zoonotic diseases. This knowledge of one-health approach to disease control could have affected their perception to the perceived severity to human diseases.

## CONCLUSION

The respondents had a low-risk perception of COVID-19 and were neither adequately prepared nor well-disposed to virtual learning recommended during the pandemic. Therefore, it is imperative to educate the students on the benefits of virtual learning beyond the COVID-19 era and the need to raise awareness on the preventive measures in anticipation of future pandemics.

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