KNOWLEDGE OF CORONAVIRUS DISEASE 2019 AND PRACTICE OF PREVENTION PROTOCOLS AMONG NURSING STUDENTS IN SOUTH-SOUTH, NIGERIA

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ABSTRACT

Background: *Coronavirus disease 2019 is a pandemic which has resulted in the daily report of thousands of deaths globally. Worse still, health authorities across the globe are struggling to contain its spread.*

Objectives: *The study assessed the knowledge of transmission, symptoms, treatment, myths and prevention practices among nursing students during the COVID-19 outbreak.*

Materials and Methods: *Descriptive cross sectional study among 242 nursing students selected from 4 Universities in 4 different states in South-South Nigeria. Online software was used to design an electronic web-based questionnaire for collecting data. Data was analyzed with frequencies, simple percentage, bar chart and tables.*
Results: *One hundred and eighty six (76.9%) did not know about coronavirus before the*
COVID-19 pandemic and 86.8% were yet to undergo COVID-19 test. The knowledge level of 47% (lower than the acceptable cut-off of 50%) indicated a low level of COVID-19 related knowledge. Also, about 76% believed that it was unsafe to receive materials shipped from China. With regards to prevention of COVID-19, a practice level of 87.7% (higher than 75%) indicated a high level of practice for the COVID-19 prevention protocols.

Conclusion: *Nursing students in South-South, Nigeria had low knowledge level of COVID-19 but high level of practice for the COVID-19 prevention protocols. More enlightenment about COVID-19 should be conducted to improve knowledge and upgrade the current prevention and control protocols.*

Keywords: *Coronavirus, COVID-19, Knowledge, Myths, Practice, Prevention Protocols, Nursing Students*

INTRODUCTION

Coronavirus disease 2019 (COVID-19) remains a public health challenge across the globe.[1] It is an infectious disease which has accounted for over 4,700,000 cases and about three hundred and twenty thousand deaths across 205 countries in the seven (7) continents of the world, with nearly 89,000 cases in Africa and over 6,200 cases in Nigeria alone within a space of 12 weeks.[2] Coronaviruses attracted little interest beyond causing mild upper respiratory tract

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infections before the year 2003 when the zoonotic Severe Acute Respiratory Syndrome-coronavirus (SARS-CoV) emerged[3] and the emergence of Middle East respiratory syndrome-coronavirus (MERS-CoV) in September 2012[4] which confirmed that the coronaviruses are significant causes of severe respiratory disease. COVID-19 is caused by a new strain of coronavirus which was discovered during an investigation into an outbreak in Wuhan, China in December 2019.[1] The virus is a protein molecule covered by a protective lipid layer which changes its genetic code (mutation) and aggressively multiplies once it is absorbed by the cells of the ocular, nasal or buccal mucosa.[5] COVID-19 is a respiratory syndrome that can spread from person to person through direct contact with respiratory droplets produced when an infected person coughs (producing as many as 3,000 droplets) or sneezes (producing as many as 10,000 droplets), indirect contact by touching a surface or object that has the virus on it and contact with an infected person's hand, mouth or eye.[6] The incubation period of the disease is 2-14 days after exposure to the virus.[1] The identifiable symptoms which include cough, fever, dyspnea, fatigue, muscle aches, sore throat, unexplained loss of taste or smell[7] are somewhat similar to symptoms of common and far less fatal conditions like common cold, malaria and bronchitis which means that suspected cases maybe ignored.[8] The outbreak of COVID-19 which spread rapidly to different countries through air travel has accounted for nearly 320,000 deaths across countries in the world and nearly 200 deaths in Nigeria alone.

In February 2020, the first case of COVID-19 was recorded in Nigeria with subsequent geometric increase in the incidence of cases due to community spread. The Nigerian Centre for Disease Control greatly lamented that limited number of test kits for aggressive testing of the population, very few testing laboratories across the nation and ineffective contact tracing mechanism bedeviled containment of the spread.[9] Particularly, the Government's inability to afford the capacity to test the population with focus only on testing suspected cases led to the promotion of awareness on the prevention protocols which include hand hygiene practices through frequent hand washing with soap and water for 20 seconds or use of alcohol-based sanitizer; maintaining physical 'social' distance of at least 6 feet (2 meters), coughing and sneezing into the bend of elbow or into a tissue which must be discarded immediately into a bin with lid; avoid touching the eyes, nose and mouth; avoiding close contact with anyone who has respiratory illnesses, use of clean mask when going out and if experiencing respiratory illnesses, staying at home if feeling unwell, self-isolation of returnees for 14 days and; calling ahead before seeking medical help when having fever, cough and dyspnea for testing and direct relieving of symptoms.[1,10]

Also, lockdown of schools, workplaces and economic activities across the nation was adopted to contain the spread. The cost of the loss incurred by the lockdown of all categories of businesses cannot be imagined because a high percentage of the population falls within the first socio-economic quintile.[9] States also adopted containment

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measures such as preparation of isolation centres, fumigation of public centres, purchase of drugs and consumables with increase in local production where possible, restriction of access to hospital facilities by non-emergency cases, decongestion of correctional facilities as well as distribution of food items to the aged and vulnerable to enhance compliance with the lockdown orders[9,11]. Non-governmental organizations and churches also contributed financial, material and food items to support the states and federal government strategies to contain the spread.[11]

As the world celebrated the World Health day for year 2020 amid the pandemic, the focus was on the importance of nurses to the society. Nurses and midwives make up about half of the health workforce, play vital lifesaving role putting their health at risk to protect the community and are the gateway between patients and other health professionals.[12] Also, irrespective of the level of care, nurses advocate for patients, get to know patients personally, give health information, prevent infection and its spread, care for and manage patients' conditions, and remain critical links between the individual, family and community. There will be global shortage of 5.7 million nurses by year 2030 if the total number of nurse graduates do not increase by eight percent yearly.[13]This implies that losing nursing students to COVID-19 will further worsen the already predicted future shortage. Considering how fast the virus can spread and the impact it will have on nursing students who incidentally form a large population of the nation's future health workforce and future frontlines of

medical cum emergency teams, this study aims at assessing the knowledge of COVID-19 and practice of prevention protocols among nursing students in South-South, Nigeria. Specifically, the knowledge of transmission, symptoms, treatment, myths and prevention practices of nursing students to contain the spread of the novel virus was assessed as a helpful approach to upgrade the current prevention and control protocols.

METHODS
Study Design
This study was a descriptive cross sectional survey.

Area of the Study
Tertiary education institutions in South-South geopolitical zone of Nigeria were used for the study. Akwa Ibom, Bayelsa, Cross River, Delta, Edo and Rivers are the six states that comprise the South-South geopolitical zone. Each state has at least one government-owned and/or private- University that train Nursing students.

Population of the Study
The population of the study consisted of all 400 and 500 level students of the Nursing Science department in all the Universities in the six states of the South-South geo-political zone of Nigeria. These category of students undergoing a 5-year Bachelor of Nursing Science degree programme were selected because from their curriculum which is designed in line with the National Universities commission (NUC) Benchmark Minimum Academic Standard (BMAS) they had received lectures on pathophysiology of respiratory diseases as well as the spread and

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containment of infectious diseases which formed the basic entry knowledge to participate in this study. Four (4) Universities in Delta, Edo, Rivers and Bayelsa states were purposively selected because of ease in communicating with the students online for data collection during the period of lockdown. Online software was used to design an electronic web-based questionnaire for collecting data over 84 hours (April 6, 2020, to April 9, 2020). The questionnaire was available to the participants through social media (WhatsApp and Instagram). Participation in this study was voluntary and the identification information of participants was not recorded anywhere on the questionnaire.

Data Collection

A Questionnaire on Knowledge of Coronavirus Disease and Practice of Prevention Protocols (KCDPPP) designed by the researchers was used for data collection in this study. Two (2) experts, lecturers in Community Health Nursing specialty from Edo University, Iyamho and Measurement and Evaluation unit from Nnamdi Azikiwe University, Awka determined the face and content validity. The reliability of the instrument was established through split half method using Cronbach's Alpha which yielded a co-efficient of 0.738. KCDPPP contains a total of thirty three (33) items and comprises four (4) sections (Sections A. B, C and D). Section A elicited information on the Personal data of the respondents (e.g. age, gender and coronavirus status). Section B comprising seven (7) items elicited information on the knowledge of COVID-19

using WHO (2020) information and recommendations about the virus. Section C comprising eight (8) items elicited information on the myths about COVID-19. Section D comprising thirteen (13) items elicited information on the practice of prevention protocols for COVID-19.

Data Analysis

The coded data collected from KCDPPP was analyzed and presented as frequencies, simple percentages and bar chart and tables. An acceptable cut-off of 50% was designated as acceptable. 25% or less was regarded as poor knowledge and practice, 26% to 50% was regarded as low level of knowledge and practice, 51% to 75% was regarded as good knowledge and practice, and above 75% was regarded as high level of knowledge and high level of practice. The data analysis was done using Statistical Package for Social Sciences (SPSS) version 22.

RESULTS

Table 1: Age, gender and COVID-19 status of respondents.

n= 242

S/N	Personal data	Variable Classification	Frequency	Percentage (%)
1.	Age (in years)	< 20 20-24 25-29 > 30	36 168 28 10	14.9 69.4 11.6 4.1
2.	Gender	Male Female	56 186	23.1 76.9
3.	Coronavirus Status	Positive Negative Awaiting result I have not tested	0 0 32 210	0 0 13.2 86.8
4.	Know someone infected	Yes No	18 224	7.4 92.6

Table 1 shows that majority 204 (84.3%) of the respondents were 24 years old or younger and 186 (76.9%) were females. Among the respondents, only 32 (13.2%) had

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been tested but still awaiting their results, therefore the COVID-19 status of all respondents was not known at the time of this report. About 224 (92.6%) of the nursing students did not know anyone infected with COVID-19.

Table 2: Knowledge of COVID-19 among Respondents.

n= 242

S/N	Knowledge of COVID-19	Variable Classification	Frequency	Percentage (%)
1.	Knew about coronavirus before the COVID-19 pandemic	Yes No	56 186	23.1 76.9
2.	Source of information on COVID-19	Social media Mass media COVID-19 taskforce World Health Organization	112 82 18 30	46.3 33.9 7.4 12.4
3.	COVID-19 is contagious	Yes No	242 0	100 0
4.	Initial cardinal symptoms	Fever, cough, dyspnea Fever, cough, fatigue	202 40	83.5 16.5
5.	Incubation period	1-14 days 2-14 days 2-28 days 1-21 days	172 70 0 0	71.1 28.9 0 0
6.	Mode of transmission	Direct contact with droplets Indirect contact from infected surfaces Contact with infected person's hand, mouth or eye Direct contact with droplets and indirect contact from infected surfaces Direct contact with droplets and contact with infected person's hand, mouth or eye Direct contact with droplets, indirect contact from infected surfaces, contact with infected person's hand, mouth or eye	56 14 46 10 34 82	23.1 5.8 19 4.1 14.1 33.9
7	Treatment	Vaccine Direct relief of symptoms Antiviral medication Direct relief of symptoms and vaccine Direct relief of symptoms and antiviral medication Vaccine and antiviral medication No treatment	26 30 24 24 36 10 92	10.7 12.4 9.9 9.9 14.9 4.1 38

Table 2 shows that 76.9% did not know the coronavirus family before COVID-19 outbreak. Among the information sources for COVID-19, social media was the highest source (46.3%), followed by mass media (33.9%), World Health Organization (12.4%) and COVID-19 taskforce (7.4%). All the participants viewed COVID-19 as contagious and 83.5% knew the initial cardinal symptoms as fever, cough, dyspnea. A few of the respondents 28.9% had correct knowledge of the incubation period as 2-14days, 33.9% had correct knowledge of the mode of transmission and 12.4% had correct knowledge of the current available treatment. The knowledge level of nursing students in South-South, Nigeria is 47% (lower than the acceptable cut-off of 50%) indicating a low level of COVID-19 related knowledge.
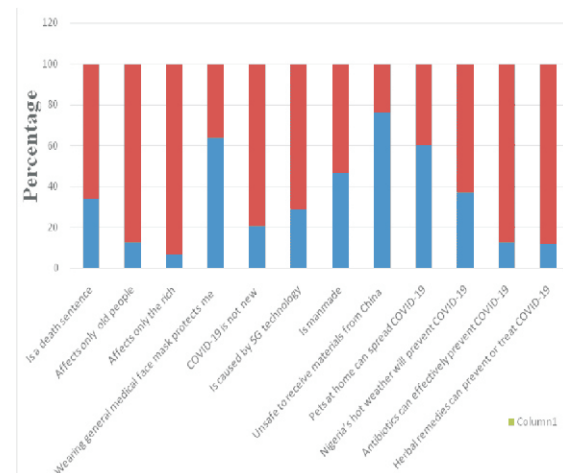

Figure 1: Opinion of respondents on the Myths about COVID-19

Figure 1 shows that majority 66.1% of the respondents disagreed that COVID-19 is a death sentence, affects only old people (87.6%) and, affects only the rich (93.4%). Also, 63.6% agreed that wearing general

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medical face mask protects them from COVID-19 while 36.4% disagreed. About 79.3% mentioned that COVID-19 was not new. Among the respondents, 71.1% disagreed that COVID-19 is caused by 5G technology. About 53.7% disagreed that COVID-19 was manmade and an act of terrorism and 76% agreed that materials from China were unsafe. Around 60.3% agreed that pets can spread COVID-19, whereas 62.8%, 87.6% and 88.4% disagreed that Nigeria's hot weather will prevent COVID-19 outbreak, antibiotics can effectively prevent COVID-19 and herbal remedies (concoction) can prevent or treat COVID-19.

Table 3: Practice of Prevention Protocols for COVID-19 by Respondents

n= 242

S/N	Practice of Prevention Protocols for COVID-19	Variable Classification	Frequency	Percentage (%)
1.	I do not touch my eyes, nose and mouth with unclean hands	Yes No	232 10	95.9 4.1
2.	I cancel events that are likely to draw crowd	Yes No	228 14	94.2 5.8
3.	I frequently wash my hands with	Soap and water Water only	230 12	95 5
4.	I clean surfaces that are frequently touched e.g. door knobs	Yes No	218 24	90.1 9.9
5.	I sneeze and cough consistently into	Bent elbow Tissue paper Palm Handkerchief Bent elbow, tissue paper or handkerchief Bent elbow or tissue paper Bent elbow or handkerchief	90 34 0 6 72 24 16	37.2 14 0 2.5 29.8 9.9 6.6
6.	Consistent use of a face mask when going out	Yes No	196 46	81 19
7.	Will seek medical help if I/my family member has the three initial respiratory symptoms?	Yes No	242 0	100 0
8.	Do you maintain physical 'social' distance?	No Yes but ≤ 5 feet Yes, at least 6 feet	16 80 146	6.6 33.1 60.3
9.	I avoid handshakes	Yes No	242 0	100 0
10.	I will self-isolate if I have the 3 cardinal symptoms of COVID-19	Yes No	242 0	100 0

Table 3 shows that majority 95.9% of respondents do not touch their eyes, nose and mouth with unclean hands, 94.2% cancel events that are likely to draw crowd, 95% frequently wash their hands with soap and water, 90.1% clean surfaces that were frequently touched, only 9.9% sneezed and coughed into their bent elbow or tissue paper. Most of the respondents 81% use a face mask consistently when going out. All the respondents affirmed that they would seek medical help if they/their family member had the three cardinal symptoms. About 60.3% maintained physical 'social' distance of at least 6 feet (2 meters) and the entire respondents affirmed that they avoided handshakes. All the respondents acknowledged that they will self-isolate if they had the 3 cardinal symptoms of COVID-19. Nursing students in South-South, Nigeria had a practice level of 87.7% (higher than 75%) indicating a high level of practice for the COVID-19 prevention protocols.

DISCUSSION

Health authorities across the globe are struggling to contain the spread of the novel COVID-19.[8] The disease which was first reported in Wuhan, China has resulted in thousands of death across 205 countries in the world.[1,2] This study is relevant because, to the best of the authors' knowledge, it is one of the initial studies regarding COVID-19 related to knowledge and practice of COVID-19 prevention protocols among nursing students, hence findings were also compared with related conditions like MERS. The findings of this study showed that nursing students had low level of COVID-19 related knowledge. In a similar study conducted in Iran it was observed that knowledge of Iranian nurses was good.[15] The difference in

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findings could be because of the non-professional qualification and limited clinical experience of nursing students.[16] In another study conducted during the MERS outbreak which is similar to COVID-19[17] reported that nursing students who were engaged in eight hours daily clinical practice in tertiary hospitals in South Korea had good knowledge. Therefore, the knowledge of nursing students about the infection was enhanced by their clinical involvement in the care of MERS patients.[17] In a similar survey among healthcare workers[18] noted that 89% of participants demonstrated sufficient knowledge of COVID-19, but doctors showed higher knowledge scores (38.56 ± 3.31) than nurses (37.85 ± 2.63) and paramedics (36.72 ± 4.82). Results of this study showed that only 23.1% knew about coronaviruses before the COVID-19 outbreak but this result was not previously described. Information on COVID-19 was gathered from a variety of sources, which included social media, mass media, COVID-19 task force and WHO but majority (43.6%) was from social media. This is similar to the findings of [19] who reported that the highest main source of COVID-19 information by health workers in Ho Chi Minh City was gathered from social media which accounted for 91.1%. Furthermore, valuable information was gathered from questions that revealed that all the respondents knew that COVID-19 was contagious, and majority 83.5% had correct knowledge of cardinal symptoms as fever, cough, dyspnea, 33.9% knew the possible modes of transmission, while few 28.9% knew the incubation period as 2-14 days and 12.4% knew that treatment involved direct relief of symptoms. These findings are similar to the findings that 99.1% knew that COVID-19 was a contagious virus and 72.8% knew that possible symptoms included fever, cough and shortness of breath.[19] The findings of this study are also similar to the report that 36.4% knew the incubation period as 2-14 days, 39% knew that COVID-19 is transmitted through air, contact and fecal-oral routes, and that 67.7% knew that supportive care is the current treatment for COVID-19.[20] Most of the findings on the opinion of respondents on the myths about COVID-19 could not be compared because no previous study known to us described similar results. However, comparison was made with few available studies which include the study by[21] which revealed that 83% of healthcare workers in Makerere University Teaching Hospitals, Uganda believed that wearing general medical facemask was protective against COVID-19. This supports the authors' findings which showed 63.6%. Furthermore, the observation that 23.9% of respondents in United States of America (USA) thought that the new coronavirus is a bioweapon[22] is related to our finding that 53.7% believed that COVID-19 is manmade. Also, 96.3% and 98.3% of participants in the study conducted in USA and United Kingdom (UK) believed that older adults were the age group likely to die from the new coronavirus.[22] Contradicting this finding, our study participants believed that COVID-19 did not only affect old people which accounted for 87.6%.

Another important finding was that nursing students had a high level of practice for the COVID-19 recommended prevention protocols. This is opposed to the finding that practice of preventive behavior for MERS was

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low, probably because it was an emerging infectious disease.[17] In the authors opinion, having high level of practice may reflect the Government's successful promotion of awareness on the prevention protocols through mass media, COVID-19 taskforce in states and local government areas and the World Health Organization because the capacity to test the population was deficient. Results of this study showed that majority of respondents 95.9% do not touch their eyes, nose and mouth with unclean hands, 94.2% cancelled events that were likely to draw crowd, 95% frequently wash their hands with soap and water and, 90.1% cleaned surfaces that were frequently touched. Most of the respondents 81% use a face mask consistently when going out. All the respondents avoided handshakes and affirmed that they would seek medical help if they/their family member had the three cardinal symptoms as well as self-isolate if they had the 3 cardinal symptoms of COVID-19. About 60.3% maintained physical 'social' distance of at least 6 feet (2 meters) and only 9.9% sneezed and coughed into their bent elbow or tissue paper.[19] found out that 92.7% of the study participants practiced frequent hand washing with soap and water to prevent COVID-19 and would accept isolation if they contracted the infection. In a similar study[21] reported that 8%, 96% and 83% of participants avoided crowded places, practiced social distance and refrained from shaking hands respectively. Also, 51.2% of the participants reported wearing a face mask when going out in public in Malaysia[23] but 75% of healthcare students and professionals in a study in Mumbai Metropolitan Region were of the opinion that the use of a facemask/respirator was not essential for people who are well.[24]

CONCLUSION

Nursing students in South-South, Nigeria had low knowledge level of COVID-19 but high level of practice for the COVID-19 prevention protocols. These findings are basic information to develop effective publicity and for designing health education programme for nursing students to prevent COVID-19. Also, the findings of this study contribute to the existing body of knowledge on assessment of the knowledge of COVID-19 and the practice of prevention protocols among nursing students, thus serving as reference for subsequent related studies in Nigeria or any other part of the world. It is recommended that more enlightenment about COVID-19 should be conducted to correct misconceptions, improve knowledge and upgrade the current prevention and control protocols with emerging findings on COVID-19. Also, health organizations should utilize social media as a means of disseminating information on COVID-19 since it is a major source of COVID-19 information to enable the populace access the channel for genuine information on COVID-19.

CONFLICT OF INTEREST
None

CONTRIBUTIONS
KPN designed study instrument, analyzed data, drafted original manuscript, reviewed the manuscript.
KPN and NCJ participated in data collection and approved the final manuscript.

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