Knowledge, attitude, and practices towards COVID-19: a cross-sectional study among nursing and midwifery students in Jalingo, Nigeria

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Received: 17 December 2020
Accepted: 05 February 2021

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ABSTRACT

Background: The coronavirus disease (COVID-19) infection rate and mortality among Nigerian health care workers appear to be on the increase. Aside from health workers, it has caused millions of infections and deaths worldwide. This study determined the level of knowledge, attitude, and practices of nursing and midwifery students towards COVID-19 in a North-Eastern Nigerian state.

Methods: A total of 156 respondents were involved in this institutional-based cross-sectional study, conducted after the lockdown period. A total of 17 questions were used to assess the KAP with knowledge appraised with 12 questions, attitudes with 2 questions, and practices with 3 questions.

Results: The majority of the students (53.80%) possessed a good level of knowledge regarding COVID-19, while 40.4% had fair knowledge regarding COVID-19 with only 5.80% having poor knowledge of COVID-19. The mean knowledge of COVID-19 in this study was 9.40±1.353 with an overall 78% correct answer rate. A vast majority of the respondent (82.7% and 98.1%) had strong confidence in Nigeria and believed that the pandemic will soon be over, respectively. Only a few avoided large gatherings of people (30.8%) with the vast majority reporting to have worn a mask when going out (84.6%) and washing their hands with running water and soap frequently as recommended (73.1%). In multiple logistic regression analyses, the COVID-19 knowledge score (OR: 0.39–0.40, 95%CI: 0.26–0.62, P<0.05) was significantly associated with a lower likelihood of negative preventive practices towards COVID-19.

Conclusions: The participants in this study showed good knowledge, positive attitudes, and good practices toward COVID-19. There is still a need to strategize and implement periodic educational interventions and training on infection control practices among healthcare workers including students.

Keywords: Attitude, COVID 19, Knowledge, Practices

INTRODUCTION

COVID-19 is caused by the new coronavirus SARS-CoV-2.1 The virus was reported to have originated from bats and the first cases of the virus were first reported in Wuhan, Hubei Province in China suggesting a possible animal-to-human spread. The disease clinically presents as an asymptomatic infection with some patients developing severe respiratory complications. The clinical presentations of the disease include fever, fatigue, dry cough, malaise, and breathing difficulty. The human-to-human transmission of the virus is very alarming and worrisome as it has caused far more than a million deaths worldwide in over 220 countries and territories. In
consequence, COVID-19 was declared a global pandemic on March 11, 2020, by the World Health Organization, after having been seen as a "Public Health Emergency of International Concern (PHEIC)" on January 30, 2020.\textsuperscript{5,7}

Before the registration of the COVID-19 index case in Lagos, Nigeria, and its subsequent spread to other states in Nigeria in February 2020, many Nigerians thought that the ailment was that of white men and that it would never get to Sub-Saharan Africa due to its hot weather condition. To avoid further spread of the virus, the Presidency announced a total lockdown of activities as a nationwide effort to slow the spread of the deadly virus on March 26, 2020. Despite the directive, some states in the country, especially those in North-Eastern Nigeria including Taraba State, continued their normal routine activities without observing social distancing and other preventive measures, as given by the Nigerian Centre for Disease Control.\textsuperscript{8} Taraba State consequently recorded her first group of six index cases among 130 interstate travelers intercepted at the state borders just 5 days after implementation of a total lockdown in the state was announced by the Deputy Governor on April 21, 2020, about a month after a total national lockdown was advised by the Presidency. Taraba State, at the time of writing this manuscript (November 19th, 2020), had a total of 136 confirmed COVID-19 cases with 139 (89.1%) discharged, 11 (7%) currently receiving treatment at the designated facilities in the state, and unfortunately 6 (3.9%) deaths.\textsuperscript{9} It is strongly believed by the authors that the true values of COVID-19 cases are far more than what is reported due to poor testing and surveillance in the state.

Healthcare workers (HCWs) such as medical doctors, dental surgeons, nurses, laboratory scientists, and other allied health professionals are tasked with offering healthcare services to the sick either directly or indirectly.\textsuperscript{10,11} This job makes them prone to infections and diseases especially during this pandemic where they have been considered by the Occupational Safety and Health Administration to be at high risk of exposure to the deadly coronavirus due to its mode of transmission.\textsuperscript{12,13} Despite the good works of the HCWs in offering care which has led to the recovery of over 39 million people out of the 35 million confirmed global cases as of November 19, 2020, the World Health Organization have reported that more than 450,000 HCWs were infected within their line of duty with more than 1000 HCWs having lost their lives to the deadly virus globally.\textsuperscript{14,15} As reported by news media, there are currently about 812 infected HCWs in Nigeria with an undocumented number of deaths.\textsuperscript{16,17}

As members of the health care team, nurses play a very crucial role in caring for patients.\textsuperscript{18} They take up essentials roles in the assessment of patients and the administration of medications. Therefore, the knowledge, attitude, and practice of future nursing practitioners are very essential to controlling this deadly virus. There is a need for nursing students to be trained in pandemic management so they can be better prepared in times like this. The variation of knowledge, attitude, and practices toward COVID-19 among individuals, communities, and even among various health institutions further justified the need for this study in North-Eastern Nigeria where the literacy rate is reported to be very low and where very little research has been done in this context.\textsuperscript{19-23}

As far as the authors are aware, this is the first cross-sectional study to assess and evaluate the knowledge, attitudes, and practices of individuals in Taraba State, within North-Eastern Nigeria that is ravaged by high poverty and illiteracy levels.\textsuperscript{24,25} The fact that very few studies have been conducted in this context and none have been done among nursing and midwifery students in Nigeria further justified the need for this study. Since these students are among the future HCWs who will be directly interacting with patients, there is a need to assess their KAP as inadequacy will translate to practices that may directly increase the risk of spread among staff and further spread to the communities. This study aims to evaluate the knowledge, attitude, and practices of nursing and midwifery students towards COVID-19. This will aid in curriculum reviews aimed at enlightening them about infectious diseases and their management and thus ensuring a reduction in infectious disease burden among HCWs and the community when they start practicing.

METHODS

Study design and participation

This is an institutional-based cross-sectional study conducted in the School of Nursing and Midwifery, Jalingo, Taraba in North-Eastern Nigeria during the period from November 10, 2020, to November 21, 2020. The targeted population was the nursing and midwifery students of the institution. All the students from the first year to final year were invited to participate in the study.

Sample size/sampling

Systematic sampling technique was used to recruit 156 consenting participants which exceeded the minimum sample size calculated using Cochran's formula for epidemiological studies. \( n = \frac{z^2 \times (1-P)}{d^2} \) Where \( n \) =sample size, \( z \) =statistics for a level of confidence (set at 1.96 corresponding to 95.0% confidence level), \( p \) =prevalence \( =88.59\% \), being the prevalence of participants that had good knowledge of COVID-19 in a previous study carried out in South-Eastern Nigeria, \( q = 1-P \) and \( d \) = degree of accuracy desired (error margin) \( =5\% \).\textsuperscript{26}

Study instrument

A pilot study was conducted on 6 subjects comprising of 3 nursing and 3 midwifery students of the school to test the questionnaire validity and reliability and they were...
excluded afterward from the study and the data generated excluded from the final analysis. Adjustments were made to the questionnaire based on the response given.

The questionnaire used for this study had two parts: Socio-demographics and a section assessing the knowledge, attitude, and practices of the participants. The variables in the socio-demographic section included age, gender, class in school, department, marital status, state of origin, and parents' highest level of education.

A total of 17 questions were used to assess the KAP with knowledge appraised with 12 questions (K1 to K12), attitudes with 2 questions (A1-A2), and practices with 3 questions (P1-P3). The questions on knowledge were about COVID-19 clinical presentations, transmission routes of the virus, and the disease prevention and control strategies. Answers to these questions were either true or false with an additional "I don't know" option. Every correct answer in the knowledge sub-section was awarded one point with no point awarded for an incorrect answer. The total scores ranged from 0 to 12 with higher values signifying an increased level of COVID-19 knowledge. Knowledge score was categorized as poor when the score was less than or equal to 6, moderate when the score is between 7 and 9, and good when it was greater than ≥ 10.

The questions on attitude were used to assess the level of confidence in the Government in successfully controlling the virus. Questions on practices investigated the participants' level of cooperation with the directives given by the Nigerian Centre for Disease Control (NCDC) in the prevention and control of coronavirus.

**RESULTS**

The respondents' socio-demographic data are presented in Table 1 below. As shown in the table, over half (69.3%) of the students were females with most of the respondents single (85.7%) and between the ages of 21–25 years of age (48.7%) with a mean of 24.04±3.825. The highest proportion of the respondents was in their second year (61.3%) while the least proportion was the year 1 students (21.7%). About two-thirds of the participants were in the department of basic nursing (68.7%) with the majority of them from Taraba State (85.7%). Concerning parents' highest level of education, most of the respondents claimed that their parents had up to tertiary education (75.3% and 43.4% for fathers and mothers, respectively).

| Characteristics                  | n  (%) | Knowledge Score (mean ± standard deviation) | t     | P value |
|----------------------------------|--------|---------------------------------------------|-------|---------|
| Age (years)                      |        |                                             |       |         |
| 17–20                            | 33 (21.9) | 9.73±0.876 | 2.813 | 0.063   |
| 21–25                            | 78 (48.7) | 9.15±1.415 |       |         |
| ≥ 26                             | 45 (29.4) | 9.60±1.468 |       |         |
| Gender                           |        |                                             |       |         |
| Male                             | 51 (30.7) | 8.82±1.740 | 15.229 | < 0.001 |
| Female                           | 105 (69.3) | 9.69±1.013 |       |         |
| Marital Status                   |        |                                             |       |         |
| Single                           | 135 (85.7) | 9.31±1.352 | 4.831 | 0.029   |
| Married                          | 21 (14.3) | 10.00±1.225 |       |         |
| Grade                            |        |                                             |       |         |
| Year 1                           | 33 (21.7) | 9.64±0.994 | 0.750 | 0.474   |
| Year 2                           | 96 (61.3) | 9.22±1.502 |       |         |
| Year 3                           | 87 (55.8) | 9.38±1.416 |       |         |
| Department                       |        |                                             |       |         |
| Basic Nursing                    | 108 (68.7) | 9.33±1.421 | 0.954 | 0.330   |
| Basic Midwifery                  | 48 (31.3) | 9.56±1.183 |       |         |
| State of Origin                  |        |                                             |       |         |
| Taraba                           | 132 (85.7) | 9.52±1.275 | 6.880 | 0.010   |
| Non-indigene                     | 24 (14.3) | 8.75±1.595 |       |         |
| Father's highest level of education |        |                                             |       |         |
| No education                     | 9 (4.9) | 8.00±2.291 | 8.669 | < 0.001 |
| Primary education                | 6 (3.9) | 9.50±1.643 |       |         |
| Secondary education              | 27 (16.0) | 8.67±1.732 |       |         |
| Tertiary education               | 114 (75.3) | 9.68±0.980 |       |         |
| Mother's highest level of education |        |                                             |       |         |
| No education                     | 18 (10.0) | 8.17±2.176 | 9.772 | < 0.001 |
| Primary education                | 24 (14.5) | 8.88±1.650 |       |         |
| Secondary education              | 48 (32.1) | 9.81±0.891 |       |         |
| Tertiary education               | 66 (43.4) | 9.64±0.939 |       |         |

The level of knowledge among the nursing and midwifery students regarding the COVID-19 pandemic is presented in Figure 1 below. A total of 12 questions were used to assess the level of knowledge among the students. As shown in Figure 1, the majority of the students (53.80%) possessed a good level of knowledge regarding COVID-19, while 40.4% had fair knowledge regarding COVID-19 with only 5.80% having poor knowledge of COVID-19. The mean knowledge of COVID-19 in this study was 9.40±1.353 (range 0-12). This score suggests...
an overall 78% (9.40/12*100) correct answer rate. Knowledge test scores differed significantly across the categories of gender (p<0.001), marital status (p=0.029), state of origin (0.010) and parents' highest level of education (both at p<0.001). In multiple logistic regression analyses, the COVID-19 knowledge score (OR: 0.39-0.40, 95%CI: 0.26-0.62, p<0.05) was significantly associated with a lower likelihood of negative preventive practices towards COVID-19 (Table 5).

The respondents' attitude towards the COVID-19 pandemic was assessed using two questions that had an "Agree" or "Disagree" and a "Yes" or "No" response. A vast majority of the respondent showed a high degree of optimism regarding the pandemic with almost all respondents (98.1%) in agreement that the pandemic will be finally controlled. The proportion of "disagree" regarding the above question was 1.9%. The attitude towards "final success" in controlling the COVID-19 pandemic did not significantly differ among the socio-demographic variables statistically (p>0.05). A vast majority of the respondents (82.7%) had strong confidence that Nigeria can win the battle against the COVID-19 virus with just 27 participants (17.3%) with a contrary opinion. The attitude towards "confidence of Nigeria winning" was statistically significant across the various age groups, class, and state of origin (p<0.05). The result of the multiple binary logistic regression carried out showed that 25-35 years age group (OR: 13.73, 95% CI: 3.67-51.35, p<0.001), year 3 students (OR: 10.47, 95% CI: 2.77-39.58, p<0.001) and Tarabans (OR: 7.33, 95% CI: 1.79-30.09, p=0.006) were significantly associated with no confidence in Nigeria winning the battle (Table 2, 3, 5).
Table 3: Results of multiple binary logistic regression analysis on factors significantly associated with attitudes towards COVID-19.

| Variable | OR (95% CI) | P value |
|----------|-------------|---------|
| A2: No confidence in Nigeria winning the battle | | |
| Age-group (25-35 vs. 17–24 years) | 13.73 (3.67–51.35) | <0.001 |
| Class (year 3 vs. year 1 and 2) | 10.47 (2.77–39.58) | 0.001 |
| State of origin (Tarabans vs. Non-Indigene) | 7.33 (1.79–30.09) | 0.006 |

Table 4: Practices of the students towards COVID-19 by demographic variables.

| Characteristics | Practices, n (%) |  | |
|-----------------|------------------|---|---|
|                 | Gone to a crowded place | Worn a mask | Washed Hands |
|                 | Yes | No | Yes | No | Yes | No |
| Age (years)     |     |     |     |     |     |     |
| 17-20           | 30 (66.7) | 15 (33.3) | 42 (93.3) | 3 (6.7) | 39 (86.7) | 6 (13.3) |
| 21–25           | 21 (63.6) | 12 (36.4) | 24 (72.7) | 9 (27.3) | 15 (45.5) | 8 (54.5) |
| ≥26             | 57 (73.1) | 21 (26.9) | 66 (84.6) | 12 (15.4) | 60 (76.9) | 18 (23.1) |
| Gender          |     |     |     |     |     |     |
| Male            | 33 (64.7) | 18 (35.3) | 42 (82.4) | 9 (17.6) | 39 (76.5) | 12 (23.5) |
| Female          | 75 (71.4) | 30 (28.6) | 90 (85.7) | 15 (14.3) | 75 (71.4) | 30 (28.6) |
| Marital Status  |     |     |     |     |     |     |
| Single          | 93 (68.9) | 42 (31.1) | 111 (82.2) | 24 (17.8) | 93 (68.9) | 42 (31.1) |
| Married         | 15 (71.4) | 6 (28.6) | 21 (100.0) | 0 (0) | 21 (100.0) | 0 (0) |
| Grade           |     |     |     |     |     |     |
| Year 1          | 24 (72.7) | 9 (27.3) | 24 (72.7) | 9 (27.3) | 18 (54.5) | 15 (45.5) |
| Year 2          | 21 (77.8) | 6 (22.2) | 21 (77.8) | 6 (22.2) | 18 (66.7) | 9 (33.3) |
| Year 3          | 63 (65.6) | 33 (34.4) | 87 (90.6) | 9 (9.4) | 78 (81.3) | 18 (18.8) |
| Department      |     |     |     |     |     |     |
| Basic nursing   | 78 (72.2) | 30 (27.8) | 90 (83.3) | 18 (16.7) | 69 (63.9) | 36 (36.1) |
| Basic midwifery | 30 (62.5) | 18 (37.5) | 42 (83.3) | 6 (16.7) | 45 (93.8) | 3 (6.3) |
| State of Origin |     |     |     |     |     |     |
| Taraba          | 84 (63.5) | 48 (36.4) | 111 (84.1) | 21 (15.9) | 102 (77.3) | 30 (22.7) |
| Non-indigene    | 24 (100.0) | 0 (0) | 21 (87.5) | 3 (12.5) | 12 (50.0) | 12 (50.0) |
| Father’s highest level of education |     |     |     |     |     |     |
| No education    | 6 (66.7) | 3 (33.3) | 6 (66.7) | 3 (33.3) | 6 (66.7) | 3 (33.3) |
| Primary education | 6 (100.0) | 0 (0) | 3 (50.0) | 3 (50.0) | 3 (50.0) | 3 (50.0) |
| Secondary education | 24 (88.9) | 3 (11.1) | 24 (88.9) | 3 (11.1) | 15 (55.6) | 12 (44.4) |
| Tertiary education | 72 (63.2) | 42 (36.8) | 99 (86.9) | 15 (13.2) | 90 (78.9) | 24 (21.1) |
| Mother’s highest level of education |     |     |     |     |     |     |
| No education    | 15 (83.3) | 3 (16.7) | 9 (50.0) | 9 (50.0) | 9 (50.0) | 9 (50.0) |
| Primary education | 15 (62.5) | 9 (37.5) | 21 (87.5) | 3 (12.5) | 21 (87.5) | 3 (12.5) |
| Secondary education | 33 (68.8) | 15 (31.3) | 48 (100.0) | 0 (0) | 33 (68.8) | 15 (31.2) |
| Tertiary education | 45 (68.2) | 21 (31.8) | 54 (81.8) | 12 (18.2) | 51 (77.3) | 15 (22.7) |
| Total           | 108 (69.2) | 48 (30.8) | 132 (84.6) | 24 (15.4) | 114 (73.1) | 42 (26.9) |

Table 5: Results of multiple binary logistic regression analysis on factors significantly associated with practices towards COVID-19.

| Variable | OR (95% CI) | P Value |
|----------|-------------|---------|
| P2: Not wearing a mask | | |
| Class (year 1 and 2 vs. year 3) | 5.73 (1.95 -16.85) | 0.002 |
| Mothers’ highest level of education (graduate vs. non-graduate) | 0.25 (0.08–0.78) | 0.018 |
| COVID-19 knowledge score | 0.39 (0.26–0.59) | <0.001 |
| P3: Don’t wash hands | | |
| Gender (females vs. males) | 3.86 (1.38–10.84) | 0.010 |
| Class (year 1 and 2 vs. year 3) | 5.06 (1.48–17.34) | 0.010 |
| State of origin (Tarabans vs. Non-Indigene) | 0.16 (0.05–0.50) | 0.002 |
| COVID-19 knowledge score | 0.40 (0.27–0.62) | <0.001 |

Concerning the practices of the respondents toward COVID-19, only a few avoided large gatherings of people (30.8%) with the vast majority reporting to have worn a mask when going out (84.6%) and washing their hands with running water and soap frequently as recommended (73.1%). The rates of the two latter practices significantly differed across some of the demographic variables (p<0.05). Multiple binary logistic regression results showed that Year 1 and 2 students (vs. Year 3 students, OR: 5.73, 95% CI: 1.95-16.85, p=0.002), graduate mothers (vs. non-graduate mothers, OR: 0.25, 95% CI: 0.08-0.78, p=0.018) and COVID-19 knowledge score (OR: 0.39, 95% CI: 0.26-0.59, p<0.001) were significantly associated with not wearing a face mask.
outside. Also, female gender (vs. male, OR: 3.86, 95% CI: 1.38-10.84, p=0.010), year 1 and 2 students (vs. year 3 students, OR: 5.06, 95% CI: 1.48-17.34, p=0.010), Tarabans (vs. non-indigenes, OR: 0.16, 95% CI: 0.05 – 0.50, p=0.002) and COVID-19 knowledge score (OR: 0.40, 95% CI: 0.27–0.62, p<0.001) were significantly associated with not washing hands with running water and soap frequently as advised (Table 4 and 5).

**DISCUSSION**

In this study, the authors present the result of a questionnaire-based study carried on nursing and midwifery students in the capital city of Taraba State in North-Eastern Nigeria. A total of 156 students participated in the cross-sectional study. The overall mean knowledge score was 9.40±1.35 (range 0-12). With an overall 78% correct answer rate. Most of the students possessed a good knowledge of COVID-19 (53.80%). Several studies conducted in Asian countries, Kenya, and Nigeria are in agreement with our finding of good COVID-19 knowledge. This trend is possible because the World Health Organization and NCDC are rightfully feeding the populace with enough COVID-19 information through the available news media. This can also be attributed to the fact that the respondents in this study were students of the nursing profession and so are expected to be quite knowledgeable.

Good knowledge of COVID-19 is of paramount importance to establishing positive attitudes toward coronavirus which is necessary for promoting healthy behaviours among the students. It is, therefore, necessary for the government to invest in activities that will promote awareness of the disease. In this study, a vast majority 98.1% of the students believed that COVID-19 will be finally controlled, and also 82.7% were confident that Nigeria can win the fight against the deadly coronavirus. This finding was far higher than the 65% and 78% reported in a similar study in West Bengal. This shows that a large population of students have strong confidence in their country, Nigeria. A study in China showed a 97.1% level of confidence among the residents that participated in the study.27

A vast majority of the respondents in this study reportedly took precautionary measures by use of face masks and also washing their hands. This is a good sign as it indicates a high level of willingness of the people in effecting behavioural changes to fighting COVID-19 together. Furthermore, it can be said that the awareness campaigns of both the Federal Ministry of Health (FMOH) and the NCDC were fruitful in educating the populace as it largely reflected on the attitudinal changes of the respondents as 84.6% and 73.1% reported to have worn a mask and washed their hands frequently, respectively. This is contrary to the findings from a previous study, which reported that only about 35% of the study participants wore face masks. Although, quite a majority of the respondents still visited crowded places, only a few (30.8%) agreed that all large gatherings should be avoided. This finding recorded in this study could be attributed to the fact that the study was conducted when the ban on large gatherings on more was lifted by the Presidency.

In the study area, only about 56.9% of the adult population is literate in English. Also, Taraba State has a poverty headcount rate of 87.73% and this means that a large number of the inhabitants in the state will be probably illiterates and under-privileged. Undoubtedly, this will translate to poor knowledge and negative attitudes towards COVID-19 and thus negates all the efforts put forward by the Government toward flattening the curve of the disease. Therefore, there is a need for another study to be done among this group of vulnerable persons using methods that is best for them.

**CONCLUSION**

The COVID-19 pandemic has a profound effect on the health system, with over 1000 HCW’s lives lost globally. The participants in this study showed good knowledge, positive attitudes, and good practices toward COVID-19. There is still a need to strategize and implement periodic educational interventions and training on infection control practices among healthcare workers including students who will be taking over the job in the nearest future.

**Funding: No funding sources**

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee of School of Nursing and Midwifery, Jalingo

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Cite this article as: Inegbenosun H, Azodo CC, Anionye JC, Inegbenosun CU, Njoku OC. Knowledge, attitude, and practices towards COVID-19: a cross-sectional study among nursing and midwifery students in Jalingo, Nigeria. Int J Community Med Public Health 2021;8:1122-8.