Research

Knowledge and Practice of COVID-19 Preventive Measures: Comparative Analysis of Medical and non-Medical Students University of Port Harcourt

Jegede IA, Iwunze E, Ifere JE

Department of Preventive and Social Medicine, Faculty of Clinical Science, University of Port Harcourt, Port Harcourt, Rivers State, Nigeria

Corresponding author: Jegede Ifetayo, University of Port Harcourt, Port Harcourt, Rivers State, Nigeria
ifetayojegede@yahoo.com; +2348034904123

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Abstract

Background: The influence of COVID-19 has impacted the education sector just like it has other sectors. This study examined the level of knowledge, attitude, and practice of COVID-19 preventive measures among medical and non-medical students of the University of Port Harcourt, Rivers State

Method: A comparative cross sectional study design using a self-administered structured questionnaire involving a total of 406 students; medical (200) and non-medical (200), using multi-stage sampling. Frequency, percentages, means, and standard deviation were used to describe data where necessary. Chi-square and Fisher exact was used to compare knowledge, attitude, and practice of COVID-19 preventive measures between medical and non-medical students.

Results: The mean age of medical and non-medical students was 25.04 and 22.59 respectively. A total of 70% from medical students arm received COVID-19 vaccines while 15.5% of non-medical students arm. 152(73.8%) non-medical students and 123(61.5%) medical students had good knowledge of COVID-19. Positive attitude toward COVID-19 preventive measures was showed by 119(59.5%) medical students and 62(30.1%) non-medical students. Concerning practice of COVID-19 preventive measures, 99(48.1%) medical students and 78(39.0%) non-medical students practiced appropriately. A chi-square test for association showed that gender, academic level, religion, accommodation status, vaccination status, geopolitical zone, and faculty of students were significantly associated with knowledge, attitude, and practice of COVID-19 preventive measures. Chi-square test also showed that knowledge of COVID-19 was significantly associated with the practice of COVID-19 preventive measures.

Conclusion: Non-Medical students had better knowledge than medical student although difference was not significant. Attitude was good and practice of COVID-19 preventive measures was poor among medical students, while poor attitude and poor practice among non-medical students was observed.

Keywords: COVID-19, Knowledge, Attitude, Practice, Medical students, Non-Medical students, undergraduates

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Introduction

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) known to cause COVID-19 infection is marked by high rates of morbidity and mortality as well as an extreme burden on both global and local health systems.[1] The SAR-CoV-2 virus had been thought to have originated from a seafood market in Wuhan; however, after the market was shut down, the virus spread from person to person through respiratory droplets, direct contact with an infected person or an infected surface, and fecal-oral pathways.[2] About 6,578,245 fatalities have been reported worldwide out of the 629,370,889 infected people.[3] Overall COVID-19-related mortality in Africa has reached 174,797, with over 3,155 of those deaths occurring in Nigeria.[3] The effects of COVID-19 have had a significant impact on various sectors, including education. The university community and the general populace have both been greatly impacted by COVID-19. Students' education was disrupted, which resulted in lost opportunities for learning, missed exams, and possibly a delay in certification.[4]

Preventive measures, such as the lockdown and closure of public spaces in the early stages, as well as non-pharmacologic ones like the use of face masks, better personal hygiene, limiting social gatherings, etc., as well as pharmaceutical ones like vaccination, were used to lessen the negative impacts. Studies have shown that knowledge and attitude may contribute to public health preventative measures among the general population[5], including students.[6] One factor that hampers students' practice of COVID-19 preventive measures is a lack of proper sensitization to actions on how to practice preventive measures in the school environment. It is crucial that students, especially those studying medicine, acquire a solid understanding of the pandemic that has had such a profound impact on them.

Due to their educational background, medical students make up a sizeable portion of the country's future health workforce and are crucial to the practice and survival of the medical profession. They are directly or indirectly involved in the management of patients in general, some of whom may be asymptomatic coronavirus carriers, during their training, especially during their clinical years. Their understanding of COVID-19 infection, its preventive measures, and the degree to which they adhere are crucial stopping COVID-19-related morbidity or mortality. According to some studies, medical students had a good level of knowledge of COVID-19,[7] adhered to COVID-19 prevention measures,[8,9] had average compliance rate among participants[10] and poor adherence to COVID-19 preventive measures.[11] High rates of hand washing practice (91.4%), social distance practice (94.8%), coughing and sneezing etiquette (87.9%), and avoidance of touching the eyes, nose, and mouth (87.9%) in Nigeria.[12] Poor knowledge, bad attitude, and poor practice are likely to affect people's livelihood, their health, and the public health system negatively by increasing the rate of infection, and its resulting mortality and morbidity. However, not only people's actions but also where they live, including the community and environment, may affect how often or what kind of COVID-19 preventive measures they choose to employ.

The general aim of this study is to examine the level of knowledge, and practice of COVID-19 preventive measures among medical and non-medical students of the University of Port Harcourt, Rivers State.

Method

Research Design: A comparative cross-sectional design was adopted for this study. This relies on the fact that the study aims to compare knowledge, attitude, and practice of COVID-19 preventive measures among medical and non-medical students.

Study Area: The study was conducted at the University of Port-Harcourt. The University of Port Harcourt is a government-owned tertiary institution, located in Choba, Rivers State Nigeria. With eleven (11) faculties and over thirty (35) departments, the university is home to 35,000 or more students.

Population for the Study: The study population consists of medical and non-medical students of the University of Port Harcourt, who are enrolled for full-time studies. The study focused on medical students from the faculty of clinical sciences and non-medical students from non-medical faculties that include humanities, social sciences, education, engineering, agriculture, and management sciences.

Sample Size determination: The sample size for the current study was determined using the formula for comparing two proportions.[13]

$$n = ((z\_(\propto/\ 2) + z\_\beta\ )\text{^}2 \times p1(100 - p1) + P2(100 - p2))/(p1 - p2)\text{^}2$$

n = minimum estimated sample size per group

$Z\alpha$ = normal standard deviate of 95% confidence level = 1.96

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Zβ = Power of study of 80% (0.84)
P1 = 0.65 (proportion of medical students with good practice[14]
1 – P1 = 0.35
P2 = 0.506 (proportion of students with good practice.[15]
n = 180.53 ≈ 181
Assuming a 10% non-response rate
Total sample size (n) = 181 + 18 = 199
The minimum sample size of students to be recruited for each group = 199
Thus, the total number of study participants = 398 students

Sampling Technique
Group 1: Medical Students
Stratified sampling was used to select medical students from the department of clinical medicine:

Stage 1: Divide into different Strata (different clinical class levels 4 – 6)
The Clinical class of the University of Port Harcourt consists of 3 classes (400L, 500L, 600L)
The 400Level class consists of 160 students.
The 500Level class consists of 86 students.
The 600Level consists of two classes (A & B)
400 Level: 160
500 Level: 86
600 Level: Class A = 104, Class B = 119
Class (A+B) = (104 + 119) = 223

Stage 2: Selection of participants from each stratum using simple random sampling (using a table of random numbers, making use of the class list)

The sample size of the strata = size of entire sample/population size * layer size.
Medical: (Clinical class)
Layer Size = 200
Population Size = 400L + 500L + 600L = 160 + 86 +223 = 469
Size of entire sample 400L = 160
Size of entire sample 500L = 86
Size of entire sample 600L = 223
400 Level:
Sample Size = (Size of entire Sample/ Population Size) * Layer size
= (160/469) * 200 = 68
500 Level:
Sample Size = (Size of entire Sample/ Population Size) * Layer size
= (86/469) * 200 = 37
600 Level:
Sample Size = (Size of entire Sample/ Population Size) * Layer size
= 223/469 * 200 = 95

Group 2: Non-Medical Students
A multistage sampling technique was used to select non-medical students:

Stage 1: Selection of one faculty from a list of non-medical faculties by balloting method of simple random sampling
The faculty of humanities was chosen out of the 11 faculties of the University of Port Harcourt, for the non-medical participant by balloting method of simple random sampling from non-medical-related faculty that include humanities, social sciences, education, engineering, agriculture, and management sciences.

Stage 2: Selection of one department from pre-selected faculty by balloting method of simple random sampling.
The department of history and diplomatic studies was chosen out of the 9 departments (Music, English Studies, Fine Arts and Design, Foreign Language & Literature, Religious and Cultural Studies, History & Diplomatic Studies, Philosophy, Theatre and Film Studies, Linguistics and Communication Studies) in the faculty of humanities through the balloting method of simple random sampling for the non-medical participants.

Stage 3: Stratified proportionate sampling of students in the selected department to different class levels.
The department of history and diplomatic studies of the faculty of humanities of the University of Port Harcourt consists of four classes (100 Level, 200 Level, 300 Level, 400 Level).
The 100 Level consists of two classes (A+B); Class A = 176, Class B = 156 = (176 + 156) = 332
The 200 Level consists of 201
The 300 Level consists of 206
The 400 Level consists of 226

Stage 4: Selection of participants in each class using simple random sampling (using a table of random numbers, making use of a class list).
100 Level
Sample Size = (Size of entire Sample/ Population Size) * Layer size
= (332/1019) * 200 = 65
200 Level
Sample Size = (Size of entire Sample/ Population Size) * Layer size

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= (201/1019) * 200 = 40

300 Level

Sample Size = (Size of entire Sample/ Population Size) * Layer size

= (260/1019) * 200 =51

400 Level

Sample Size = (Size of entire Sample/ Population Size) * Layer size

= (226/1019) * 200 = 44

Method of Data Collection

Medical (clinical) Students

Clinical students stratified into various clinical classes whose class registration numbers have been selected via simple random sampling were approached during free lecture periods, talked to about the purpose of research, and ensured their consent was given, before being issued a copy of the questionnaire to fill.

Non-medical Students

After random selection of faculty and department, stratification of classes into various levels, and selection of registration numbers, students whose registration numbers are selected were approached as described above, talked to about the purpose of the research, and ensured their consent was given, before being issued a copy of the questionnaire to fill.

Study Instrument/Tool

A structured, self-administered questionnaire was used for the study and the sections of the instrument were four (4).

Section A: Socio-demographic data, eight (8) questions.

Section B: Knowledge of Covid-19 thirteen (13) questions, with options of Yes, No, I don't know.

Section C: Attitude towards Covid-19, eight (8) questions on a Likert scale

Section D: Practice of Covid-19 preventive measures fifteen (15) questions, with options of Yes, No, I don't know

Validity/Reliability of Instrument

A pretest of the study tool was carried out on a population of 30 students attending the state university of science and technology, Rivers state. The results were used to check for ambiguous wording and ascertain its comprehensibility among respondents.

Method of Data Analysis

Data Collection: Data was collected from students using a Google forms.

Data Analysis: Data was collected, collated, cleaned and analyzed using SPSS Version 25 statistical software and ranked using Likert scale.

Descriptive Statistics: Categorical data was presented in frequencies and percentages, while continuous data was presented in means and standard deviations.

Knowledge and practice scores questions were scored 1 for each correct answer and zero for a wrong answer, while the Likert scale was scored such that the highest number of 5 goes for the most desirable answer and 1 for the least desirable answer. The sum of scores was calculated.

A score of less than 50% for knowledge attitude and practice was considered poor, negative attitude and inappropriate respectively, and a score of 50% and above was considered good positive and appropriate respectively.[16]

Inferential Statistics: Chi-Square analysis were used to assess the association of knowledge, attitude and practice among medical and non-medical student. All analysis was done at a 95% confidence interval and a p-value<0.05 was considered significant.

Data analysis was conducted using IBM SPSS version 25. Frequency, percentages, means, and standard deviation will be used to describe necessary data. Chi-square was used to compare knowledge, attitude, and practice of COVID-19 preventive measures between medical and non-medical students.

Ethical Approval

Ethical approval was sought from the University of Port Harcourt ethics review board (UPH/CEREMAD/REC/MM84/005). Permission to conduct research was also sought from the head of departments. Informed consent forms were obtained from each participant, before the interviews. All personal information of the participants remained confidential.

Results

A total of 400 participants' data: 200 for medical students and 200 for non-medical students were analyzed. As shown in table 1, the mean age of medical students was 25.04 and that of non-medical students being 22.59. With regards to gender, males were in majority at 106 (26.1%), 141 (34.7%) for medical and non-medical student populations respectively. No students were sampled in the medical category for levels 100 – 300, and levels 500 and 600 for the non-medical category. For level 400 both medical and non-medical students were sampled,

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medical students represented 64 (15.8%) of the population and non-medical students represented 46 (11.3%) of the population. Also highlighted in table 1 is that more non-medical students (42.2%) resided outside school hostels, more medical students (35.7%) resided in hostels.

Table 1: Socio-demographic details of study participants

Variables		Medical (n = 200)	Non-Medical (n = 200)
		N (%)	N (%)
Age (years)	Mean ± SD	25.0±2.5	22.6±2.7
	18 -23	52 (12.8)	130 (32.0)
	24 - 29	140 (34.5)	74 (18.2)
	30- 35	8 (2.0)	2 (0.5)
Gender	Male	106 (26.1)	138 (69.0)
	Female	94 (23.2)	62 (31.0)
Level	100	0 (0.0)	64 (15.8)
	200	0 (0.0)	42 (10.3)
	300	0 (0.0)	54 (13.3)
	400	64 (15.8)	46 (11.3)
	500	39 (9.6)	0 (0.0)
	600	97 (23.9)	0 (0.0)
Accommodation	Parents	0 (0.0)	11 (2.7)
	Off-Campus	55 (13.5)	171 (42.2)
	Hostel	145 (35.7)	24 (5.9)

Table 2: Vaccination Status of Students

Vaccination status	Medical students	Non-medical student	χ^2	p-value
Unvaccinated	60 (30%)	169 (84.5%)	121.36	**<0.001**
Vaccinated	140 (70%)	31 (15.5%)		

According table 2, it is evident only few students sampled had received the COVID-19 vaccine. Of the recipients, 140(70%) were in the medical class and 31(15.5%) in the non-medical students took the vaccine.

Table 3: Knowledge Attitude and Practice of COVID-19 among Medical and Non-Medical students

Variable		Number of Respondents-Freq (%)	
		Medical	Non-medical
Knowledge	Good	123 (61.5%)	152 (73.8%)
	Poor	77 (38.5%)	48 (26.2%)
Attitude	Positive	119 (59.5%)	60 (30.0%)
	Negative	81 (40.5%)	140 (70.0%)
Practice	Appropriate	78 (39.0%)	96 (48.0%)
	Inappropriate	122 (61.0%)	104 (52.0%)

As shown in table 3, among the student population who had good knowledge of COVID-19 of which 152 (73.8%) were non-medical students and 123 (61.5%) were medical students. While 77(38.5%) medical and 48(26.2%) non-medical students had poor knowledge of Covid-19.

Among those who had a positive attitude, 119 (59.5%) were from the medical arm while 62 (30.1%) were from the non-medical arm. While 140 (70%) of non-medical students and 81 (40.5%) of medical students showed negative attitude.

Concerning practice of Covid-19 preventive measures, 78 (39.0%) medical student and 96 (48.0%) practiced COVID-19 preventive measures appropriately. Among those who practiced inappropriately, 122 (61.0%) medical students and 104 (52.0%) non-medical student.

Table 4: Difference between COVID-19 knowledge, Attitude and Practice among medical and non-medical students

Variable		Staff category		χ^2	P-Value
		Medical	Non-Medical		
knowledge	Good	143(161.5)	180(161.5)	22.018	<0.001*
	Poor	57(38.5)	20(38.5)		
Attitude	Positive	190(194)	194(194)	1.042	0.307

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	Negative	10(8)	6(8)		
Practice	Appropriate	108(116.6)	125 (116.5)	2.971	0.085
	Inappropriate	92(83.5)	75 (83.3)		

*Statistically significant

A chi-square test as shown in table 4 reveled that there was a statistically significant association between faculty and knowledge of the COVID-19 with more non-medical students possessing good knowledge than their medical counterparts ($\chi^2 = 22.018$; $p = 0.001$).

The result of a chi-square test, showed that there is no difference in medical and non-medical students' attitude 1.042 (p=0.307. Likewise there is also no difference between the practice of COVID-19 preventive measures among medical and non-medical students 2.971 (p=0.085) of COVID-19 preventive measures.

Table 5: The relationship between knowledge of COVID-19 and practice of COVID-19 preventive measures

Variable		**Preventive Measures**			
		Appropriate	**Inappropriate**		**P-Value**
Knowledge	Good	149 (54.2)	126 (45.8)	38.840	< 0.001*
	Poor	28 (21.4)	103 (78.6)		

*Statistically significant

A chi-square test for the association as shown in table 5 showed that knowledge of COVID-19 was significantly associated with the practice of COVID-19 preventive measures ($\chi^2 = 38.840$; $p < 0.001$).

Discussion

Acquiring knowledge about SARS-CoV-2 infection is similar to acquiring knowledge about any other disease in that, both enable people to take preventive action against the disease, as has been shown. According to the report of this study: Non-Medical student had better knowledge than medical student although difference was not significant. Attitude was good and practice of COVID-19 preventive measures was poor among medical students, while poor attitude and poor practice among non-medical students was observed. While this is in agreement with a study in China[17] and Pakistan[18] both of which reported a statistically significant difference in medical and non-medical students' knowledge of COVID-19 preventive measures, it varies in the direction of the difference. While the current study highlights that non-medical students' knowledge of COVID-19 was higher than that of their medical counterparts, the study in China[17] and Pakistan[18] documented that medical students' knowledge was higher than that of their non-medical counterparts. One would expect that the curriculum of medical students gives them an edge over others in being knowledgeable about diseases and infections. While this can be true, the extant difference noticed in the current study could be ascribed to the availability of COVID-19 information across all quarters of Rivers State, the fear it bred which is capable of leading to personalized search on the internet and other media outlets for information, and individual need to stay safe. This strongly aligns with Bangladesh[19] reports that revealed that nearly all non-medical students knew that avoiding crowded places, facemask use, and frequent handwashing were preventive measures. This suggests that campaigns and initiatives aimed at enhancing university students' awareness of COVID-19 did not categorize medical students as experts but rather was encompassing. Another comparative study however disagree with the reports of this study, stating that there is no significant difference in the knowledge of medical and non-medical students about COVID-19 preventive measures.[20]

In the application of disease preventive measures, attitude toward disease is just as deterministic as knowledge about the disease. In other words, those who have a positive attitude about an illness are more likely to undertake disease preventive measures than people who have negative attitudes.

The current study revealed that the difference in preventive attitudes among medical and non-medical students was statistically significantly different, with more medical students showing positive attitudes towards COVID-19 preventive measures than their non-medical counterparts but this difference wasn't significant.

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While ward visitations and assessments of ill patients (some of which might be COVID-19 related) by medical students might be a plausible reason for a higher number of medical students with positive attitudes towards COVID-19 preventive measures, non-medical students' absence from wards plus the pool of conspiracy theories surrounding the COVID-19 infection might be a reason for the lower number of non-medical students with positive attitudes towards COVID-19. For the current study, an excellent pointer to the effect of attitude on the practice of preventive measures is the report on vaccination status. According to the current study, more medical students have received the vaccine compared to their non-medical counterparts. Although slightly higher, the report in China[12] stated that over half of medical students in their study had positive attitudes towards COVID-19 preventive measures corroborates the current study. Also in corroboration is the study another study from the Phillipines[21] showed that 41.8% of medical, and 37% of non-medical students had a positive attitude towards COVID-19 preventive measures. Some studies have however stated that there is no difference in the attitude of medical and non-medical students.[18] Even with the awareness to encourage vaccination, the practice of preventive measures is a necessity in other to avert the spread and occurrence of new infections. Among the medical and non-medical student population, those who practiced COVID-19 preventive measures, more were from the medical arm as compared to those from the non-medical arm. In general, there was no difference in the practice of COVID-19 preventive measures among medical and non-medical students, this is similar to a study in Jordan[20] among Asian medical and non-medical students. However, differences existed for specific measures.

In line with question-specific attitudes, the current study showed that a majority of both medical and non-medical students positively responded to obeying the government and international organization protocols as regards COVID-19 infection. This is in agreement with reports of a study conducted in South-East, Nigeria[12] which documented that 93.1% of the participants believed that following standard protocols for infection control, as outlined by the government and global health organizations was a prerequisite for the control of COVID-19.

Students enroll in universities primarily to deepen their knowledge of a subject, which enhances their skills and subject-related practice. For the practice of disease-related preventative actions to be improved, knowledge is especially crucial. According to the report of the current study, there was a statistically significant association between knowledge and practice of COVID-19 preventive measures among medical and nonmedical students of the University of Port Harcourt. This is in agreement with other reports which documented that receiving teachings/classes about COVID-19 improved students' adherence to COVID-19 preventive measures and that knowledge of one preventive measure is likely to improve the search for other preventive measures and subsequent practice.[8,22,23]

Implications of the study: This study will provide valuable knowledge in addition to the existing knowledge for future researchers and academia. It will encourage government and schools' authorities to introduce policies that promote the practice of infection control measures through a curriculum review that should focus on integrating health-promoting courses across all disciplines.

Limitations:
The study utilized a cross-sectional design which limits the report of factors associated with knowledge, attitude, and practice of COVID-19 preventive measures.
Based on COVID-19 laws at the time, it is possibly for medical student to have knowledge but no practice, which will affect the answers in the questionnaire.

Conclusion

The SAR-CoV-2 outbreak ushered in a time marked by negative concerns in a variety of spheres of life, including family, economy, and health. It caused deaths and raised the probability of dying from an illness that was already present. The closure of schools is one of the primary effects of the SAR-COV-2 outbreak on the student population. The current study showed that both medical and non-medical students had good knowledge of covid19 but the non-medical student had a significantly better knowledge than the medical student. Medical student also showed better attitude but poor practice towards covid19 as compared to the non-medical student who showed poor attitude and poor practice. Knowledge of covid19 was significantly associated with practice.

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Declarations

Ethical Consideration: Ethical approval was sought from the University of Port Harcourt ethics review board (UPH/CEREMAD/REC/MM84/005).

Conflict of interest: There are no conflicts of interest among the authors.

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