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Knowledge, Attitude and Perception of COVID- 19 Testing among University of Abuja Students in Gwagwalada, FCT Abuja: A Cross-Sectional Study

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Introduction

In December 2019, World Health Organization (WHO) was notified of several cases of pneumonia in Wuhan City, Hubei Province of China, an outbreak of unknown origin, raising global health concerns due to the ease of transmission. WHO stated its risk assessment worldwide for the Coronavirus as being very high and declared the coronavirus a pandemic on the 11th of March, 2020. By March 31st of the same year, more than a third of humanity was under some form of lockdown [1]. To quickly diagnose and control the highly infectious disease, suspected individuals were isolated, and diagnostic/therapeutic procedures were developed via patients' epidemiological and clinical data. This pandemic caused World leaders to converge efforts in ensuring access to tests, vaccines, and treatments for COVID- 19 as they develop. WHO also has been working with global experts to learn more about the virus, how it affects the people who are infected, the management, and likely acceptable response from countries. Coronaviruses are zoonotic, meaning they are transmitted between animals and humans. Several known coronaviruses are circulating in animals that are yet to infect humans [2]. The interval between the time of invasion by an infectious coronavirus (SARS-CoV-2) and appearance of the first sign or symptom, the incubation period is on average 4–5 days but may be as long as 14 days

Coronaviruses usually cause mild to moderate upper-respiratory tract illnesses, like the common cold. Most people get infected with these viruses at some point in their lives [3]. The presence of COVID- 19 is manifested by several symptoms, ranging from asymptomatic/mild symptoms to severe illness and death. Common symptoms include cough, fever, and shortness of breath. Other reported symptoms are weakness, malaise, respiratory distress, muscle pain, sore throat, and sudden loss of taste and/or smell.

There are two types of tests currently done regarding COVID- 19, a diagnostic test and a test for detecting a past infection [4]. The diagnostic test takes a sample from the respiratory tract. The test requires a swab to be collected from the back of the throat, going in through the nose, to detect the viral RNA in the respiratory tract, suggesting that one has an active infection. By the time such a person recovers, the development of IgG antibodies is achieved, and when a sample of blood is taken, the diagnosis of past infection of COVID- 19 can be made. Neither of these tests is perfect, but they are very useful tools for identifying people with past infection and those currently infected. The justification of this research is projected towards broadening the knowledge, perception of risk and attitude of people on COVID- 19 testing. Haven seen the possibility of asymptomatic carriers and flu-like symptoms which could easily be neglected in this part of the world and many other low income countries, individuals could easily relax physical distancing and other personal protective measures designed to reduce the transmission of the virus to others.

Materials and Methods

Study Design and Study Area

This study was carried out in Gwagwalada, a community in Gwagwalada Area Council of the Federal Capital Territory, Abuja in 2021.The study population was university students of Gwagwalada campus within the age of 18years and above, as this is the adventurous age bracket most likely to be exposed to the COVID- 19, violate the COVID- 19 safety protocols, a wide coverage and true representation of the campus. A descriptive, cross-sectional, questionnaire-based design was adopted for this study.

Ethical Considerations

This study observed the ethical principles; confidentiality, voluntariness, beneficence and non-maleficent as in the Belmont report.

Ethical approval for this study was obtained from the Health Research and Ethics Committee (HREC) of the University of Abuja Teaching Hospital. Appropriate campus (community) entry was done to initiate formal acceptance and Permission for this study in the students community. Leaders of households and heads of families were also approached to seek permission to interact with their members in cases where students live with their parents, before administering the questionnaires to them. All respondents were duly informed about the objectives and design of the study and their questions answered, and informed consent obtained. Issues bothering on the confidentiality of the information they provided were also addressed, there was no form of coercion in any way either in the form of cash, cheques, gift or use of force. All participants participated out of their free and good will.

Sample Size Estimation

The sample size was calculated using the Leslie-Kish formula.

n=Zx2 pq/d2

Where n is the sample size,

Zx is standard normal deviation taken as 1.96,

P is prevalence taken as 1.5% i.e. (0.015),

q=1 – p (0.85),

And d is degree of precision taken as 5% (0.05),

(1.962)2 x0.015x0.85 =n

(0.05)2

3.8416x0.015x0.85 =n

0.0025

0.0489804 =n

0.0025

19.59 =n, = 20

10% (0.1) for non-response

0.1x 20

= 1.959

Adding 10% for non- response

=22.

However, owing to the small size of this value, sample size of 272 was adopted [5].

Sampling and Data Collection

Multistage sampling technique was used. The first stage, simple random sampling was used to select one campus out of the two students' communities in the University of Abuja by balloting. The second stage involved choosing three departments from each faculty in the campus as in stage one. In the third stage, systematic random sampling technique was used to select every fifth departmental student of the department of interest from stage two immediately after their lectures as they file out of the class considering those who met the criteria as above (1 in 5 student within the age of 18years and above).

A pre-tested semi-structured self/interviewer administered questionnaire comprising of four sections was used to collect data. Section A obtained respondents socio-demographic data, Section B assessed perception of students on COVID- 19 testing, Section C collected information on knowledge of respondent on COVID- 19 testing, Section D on the attitude of COVID- 19 testing among the respondent. There was section E and F which collected data on the barriers and motivations to COVID- 19 testing respectively. We ensured a consistent dexterity on proper interviewing, interpretation of any envisaged difficult section of the questionnaire and accurate data keeping. Respondents were given informed consent form before the questionnaires was administered, and were left alone where they declined.

The knowledge section had 5 questions: one (1) regarding the causative organism of the disease, one (1) regarding symptoms, one (1) regarding mode of prevention and control of COVID- 19 and one (1) regarding COVID- 19 testing. These questions were framed with three options of answers (Yes / No / Don't know). A correct answer was scored 1 point and incorrect/ unknown answer secured 0 point. The total points scored by each individual ranged between 0 and 15, high score indicated good knowledge towards COVID- 19 testing. A score of 0-5 was graded as poor; score 6-10 was graded as moderate while score of 11-15 was graded as good. The attitudes towards COVID- 19 testing was measured by 5 questions, about the attitude on the prevention and control of COVID- 19 and as well as attitude towards testing for COVID- 19. This questions were framed using Likert scale. The total points scored by each individual ranged between 0 and 5; high score indicated positive attitude towards COVID- 19 testing. A score of 0-1 was graded as poor; score 2-3 was graded as moderate while score of 4-5 was graded as good.

Data Analysis

Data collated was cleaned, coded, entered into a computer where they were analyzed using Statistical Package for Social Sciences (SPSS version 23) (IBM-SPSS). The eventual outcome was presented using appropriate tables. Categorical variables are described using frequencies and percentages while continuous variables are expressed as mean and standard deviation. Cross tabulation and Pearson Chi-square was used to determine association between dependent variables. The perception,

knowledge and attitude of the COVID- 19 testing among the sampling population were structured questions, offering different choices for the respondents on respective sections and every analyzed right response was provided a maximum score of 100% and a minimum of 0% on each wrong response. The responses of each respondent were evaluated and respondents scored appropriately using likert scale for attitude and other convenient scales for the rest parameters.

Results

Socio-Demographics

This study was carried out among 272 respondents, majority (61.6%) were females, a high percentage of respondents were age range 21-30year old (56.1%), the least age range of participants was 31years and above. Majority of the respondents (217) are Christians while other religions made up about 1.1% only. Considering the total number of respondents, 245 are singles with 61.6% being females, 16 respondents married with 25% being males and 6 respondents separated with 50% being females. The respondents are of various ethnic groups in Nigeria with the majority (40.2%) of the respondents belonging to the minority ethnic groups termed "other". The majority ethnic groups such as the Igbo, Yoruba, Hausa/Fulani respondents were 24.3%, 28.8% and 6.3% respectively. The majority of the respondents (91.5%) have tertiary level of education.

Table 1: Socio-Demographic Characteristics

Variables	Male (%)	Female (%)
Age range		
18 – 20	33(35.9)	59(64.1)
21 – 30	59(38.8)	94(61.2)
31 and above	12(44.4)	15(55.6)
Total	104 (38.4)	168(61.6)
Religion		
Christianity	78(35.9)	139(64.1)
Islam	25(49.0)	26(51.0)
Others	1(33.3)	3(66.7)
Total	104(38.4)	168(61.6)
Marital Status		
Single	94(38.4)	152(61.6)
Married	4(25.0)	12(75.0)
Separated	3(50.0)	3(50.0)
Divorced	1(100.0)	0(0.0)
Widowed	1(100.0)	0(0.0)
Others	1(50.0)	1(50.0)
Total	104(38.4)	168(61.6)
Tribe		
Hausa/Fulani	9(52.9)	8(47.1)
Yoruba	21(26.9)	58(73.1)
Igbo	23(34.3)	44(65.7)
Others	51(46.8)	58(53.2)
Total	104(38.4)	168(61.6)
Level of Education		
Primary	3(42.9)	4(57.1)
Secondary	10(71.4)	4(28.6)
Tertiary	89(35.9)	160(64.1)
Others	2(100.0)	0(0.0)
Total	104(38.4)	168(61.6)

Knowledge of COVID-19 Testing

Among the 272 respondents sampled, 168 (61.8%) had a good knowledge of COVID- 19 testing. There was poor knowledge of COVID-19 prevention methods among 183(67.7%) of respondents while about 214(78.3%), 215(79.0%) and 213(78.3%) have good knowledge of COVID-19 cause, symptoms and testing process respectively.

Table 2: Knowledge of COVID-19 Testing

Variables	Male (%)	Female (%)
COVID-19 Cause	214(78.3)	58(21.7)
COVID-19 Symptom	215(79.0)	57(21.0)
COVID-19 Prevention	88(32.4)	184(67.7)
COVID-19 Testing	213(78.3)	59(21.7)
Knowledge Scores	≥50%	< 50%

Relationship between Socio-Demographic Characteristics and Knowledge of COVID- 19 Testing

The knowledge of COVID- 19 testing among the respondents as affected by socio-demographics is shown below in a tabular form. Across all age range in the study, majority of the participants had good knowledge of COVID- 19 testing. About 217 of the participants were Christians with a good knowledge of 56.2% while the Muslim population was 52 respondents with a good knowledge of 55.8%. The other religions grouped together had only 3 respondents with 66.7% having poor knowledge of COVID-19 testing. The majority of the respondents were single with 135(55.1%) having good knowledge of COVID testing. Out of the 16 married respondents who participated in the study, 56.3% have good knowledge of COVID testing. About 61.1% of the Hausa/Fulani respondents had good knowledge of COVID- 19 testing, 58.8% of the Yoruba tribe showed poor knowledge, 56.7% (38) Igbo respondents showed good knowledge of COVID- 19 testing. One hundred and nine respondents were from the minority ethnic groups with 61.5% having good knowledge of COVID- 19 testing. About 14 and 248 respondents with secondary and tertiary level of education participated in the study, 78.6% and 54.0% had good knowledge of COVID- 19 testing respectively. There was a significant association between the level of education and knowledge of COVID- 19 testing ($p<0.05$).

Table 3: Relationship between Socio-Demographic Characteristics and Knowledge of COVID- 19 Testing

	Good Knowledge	Poor Knowledge	Total	Chi square	P – value
Age range					
18 – 20	52(56.5)	40(43.5)	92	6.057	0.972
21 – 30	84(55.3)	64(44.7)	152		
31 and above	16(57.1)	12(42.9)	28		
Total	152(55.9)	120(44.1)	272		
Religion					
Christianity	122(56.2)	95(43.8)	217	0.629	0.730
Islam	29(55.8)	23(44.2)	52		
Others	1(33.3)	2(66.7)	3		
Total	152(55.9)	120(44.1)	272		
Marital Status					
Single	135(55.1)	110(44.9)	245	4.383	0.496
Married	9(56.3)	7(43.7)	16		
Separated	5(71.4)	2(28.6)	7		
Divorced	0(0.0)	1(100.0)	1		
Widowed	1(100.0)	0(0.0)	1		
Others	2(100.0)	0(0.0)	2		
Total	152(55.9)	120(44.1)	272		
Tribe					
Hausa/Fulani	11(61.1)	7(38.9)	18	4.592	0.204
Yoruba	36(46.2)	42(58.8)	78		
Igbo	38(56.7)	29(43.3)	67		
Others	67(61.5)	42(38.5)	109		
Total	152(55.9)	120(44.1)	272		
Level of Education					
Primary	7(87.5)	1(12.5)	8	9.045	0.029*
Secondary	11(78.6)	3(21.4)	14		
Tertiary	134(54.0)	114(46.0)	248		
Others	0(0.0)	2(100.0)	2		
Total	152(55.9)	120(44.1)	272		

Attitude

The study shows that about 202(74.3%) had good attitude towards the testing for COVID- 19. Poor attitude towards COVID-19 testing to reduce transmission rate and covid-19 testing often leading to being isolated was 120(44.1%) and 113(41.7%) respectively. However, the response to testing for prevention of COVID-19, COVID-19 testing often resulting in positive result and COVID-19 testing being a useful method of controlling the pandemic were found to be of good attitude with values of 219(80.5%), 165(62.0%) and 207(76.1%) respectively.

Table 4: Attitude of COVID-19 Testing

Attitude	Good Attitude n (%)	Poor Attitude n (%)
Testing For Prevention	219(80.5)	53(19.5)
Testing To Reduce Transmission Rate	152(55.9)	120(44.1)
Covid-19 Testing Often Positive	165(62.0)	101(38.0)
Covid-19 Testing Often Leads to Being Isolated	158(58.3)	113(41.7)
Covid-19 Testing Not Useful	207(76.1)	65(23.9)
Scores of Attitude	≥50%	< 50%
	202(74.3)	70(25.7)

Relationship between Socio-Demographic Characteristics and Attitude towards COVID-19 Testing

The age range of 18-20 and 21 -30 had poor attitude of 73.9% (68) and 61.2% (93) respectively however, more than half 57.1% (16) of respondent who are 31 year and above had good attitude of COVID- 19 testing. The Christians and Muslims both had poor attitude of 65.4% (142) and 55.8% (29) respectively likewise the others which had poor attitude of 66.7% (2). The Hausa/ Fulani, Yoruba, Igbo and the other minority ethnic group all had poor attitude of 61.1% (11), 67.9% (53), 71.6% (48) and 56.0% (61) respectively. Almost two-third 64.3% (9) of the respondents with secondary level of education had good attitude while the tertiary level of education respondents had poor attitude of 64.9% (161) respectively. There was a significant association between the age of respondents and knowledge of COVID- 19 testing ($p<0.05$).

Table 5: Relationship between Socio-Demographic Characteristics and Attitude towards COVID- 19 Testing

	Good Attitudes	Poor Attitudes	Total	Chi square	P – value
Age range					
18 – 20	24(26.1)	68(73.9)	92	1.833	0.400
21 – 30	59(38.8)	93(61.2)	152		
31 and above	16(57.1)	12(42.9)	28		
Total	99(36.4)	173(63.6)	272		
Religion					
Christianity	75(34.6)	142(65.4)	217	2.880	0.237
Islam	23(44.2)	29(55.8)	52		
Others	1(33.3)	2(66.7)	3		
Total	99(36.4)	173(63.6)	272		
Marital Status					
Single	86(35.0)	160(65.0)	245	16.439	0.006*
Married	9(56.3)	7 (43.7)	16		
Separated	3(42.9)	4(57.1)	7		
Divorced	0(0.0)	1(100.0)	1		
Widowed	0(0.0)	1(100.0)	1		
Others	1(50.0)	1(50.0)			
Total	99(36.4)	173(63.6)	272		
Tribe					
Hausa/Fulani	7(38.9)	11(61.1)	18	6.993	0.072
Yoruba	25(32.1)	53(67.9)	78		
Igbo	19(28.4)	48(71.6)	67		
Others	48(44.0)	61(56.0)	109		
Total	99(36.4)	173(63.6)	272		
Level of Education					
Primary	2(25.0)	6(75.0)	8	4.949	0.176
Secondary	9(64.3)	5(35.7)	14		
Tertiary	87(35.1)	161(64.9)	248		
Others	1(50.0)	1(50.0)	2		
Total	99(36.4)	173(63.6)	272		

Perception

Good perception of COVID- 19 testing was seen more than half 163 (59.9%) of the participants while about 109 (40.1%) of respondents have poor perceptions of COVID- 19 testing in the studied population. About 255 (93.8%) respondents had good perception of COVID- 19 being transmissible while about 77(28.3%) have the perception that testing is a means of inoculation.

Table 6: Perception of Students to COVID-19 Testing

Perception	Good Perception N (%)	Poor Perception N (%)
COVID-19 caused by germs	143(52.6)	129(47.4)
COVID-19 transmissible	255(93.8)	17(6.3)
COVID-19 testing: a means of inoculation	195(71.7)	77(28.3)

Scores of Perceptions	≥50%	< 50%
	162(59.9)	109(40.1)

Relationship between Socio-Demographic Characteristics and Perception Towards COVID- 19 Testing

The socio-demographic distribution of the perception of COVID- 19 testing among the respondents is tabulated below. It shows that the majority of participants in this study fall within the age range of 21- 30 year (152 respondents) among which 62.5% of them had good perception of COVID- 19 testing. About 217 of the participants were Christians with a good perception of 60.8%. The other religions grouped together had only 3 respondents with 100% of the respondent having good perception. The population of respondents who are single was 245 with 132(61.6%) having good perception and 38.4% having poor perception. Out of the 16 married respondents who participated in the study, 68.8% have good perception while the 7 and 1 respondents who are separated and divorced respectively had 100% poor perception. Likewise, the 2 respondents who didn't associate with any marital status had 100% poor perception of COVID- 19 testing.

The study had 18 Hausa/Fulani respondents, with 61.1% showing poor perception of COVID- 19 testing, 78 Yoruba with 67.9% showing good perception, 67 Igbo with 64.2% showing good perception of COVID- 19 testing. One hundred and nine respondents were from the minority ethnic groups with 55% showing good perception of COVID- 19 testing. Out of 14 and 248 respondents with secondary and tertiary level of education that participated in the study, 71.4% and 60.5% had good perception of COVID- 19 testing respectively. There was a significant association between the marital status and perception towards COVID- 19 testing ($p<0.05$).

Table 7: Relationship between Socio-Demographic Characteristics and Perception towards COVID- 19 Testing

	Good perception	Poor perception	Total	Chi square	p – value
Age Range					
18 – 20	50(54.3)	42(45.7)	92	1.833	0.400
21 – 30	95(62.5)	57(37.5)	152		
31 and above	18(64.3)	10(35.7)	28		
Total	163(59.9)	109(40.1)	272		
Religion					
Christianity	132(60.8)	85(39.2)	217	2.880	0.237
Islam	28(53.8)	24(46.2)	52		
Others	3(100.0)	0(0.0)	3		
Total	163(59.9)	109(40.1)	272		
Marital Status					
Single	151(61.6)	94(38.4)	245	16.439	0.006*
Married	11(68.8)	5(31.2)	16		
Separated	0(0.0)	7(100.0)	7		
Divorced	0(0.0)	1(100.0)	1		
Widowed	1(100.0)	0(0.0)	1		
Others	0(0.0)	2(100.0)	2		
Total	163(59.9)	109(40.1)	272		
Tribe					
Hausa/Fulani	7(38.9)	11(61.1)	18		
Yoruba	53(67.9)	25(32.1)	78		
Igbo	43(64.2)	24(35.8)	67	6.993	0.072
Others	60(55.0)	49(45.0)	109		
Total	163(59.9)	109(40.1)	272		
Level of Education					
Primary	2(25.0)	6(75.0)	8	4.949	0.176
Secondary	10(71.4)	4(28.6)	14		
Tertiary	150(60.5)	98(39.5)	248		
Others	1(50.0)	1(50.0)	2		
Total	163(59.9)	109(40.1)	272		

Barriers to COVID-19 Testing

The study shows that 16.2% (44) thinks that difficulty accessing a testing centre for COVID- 19 wasn't a barrier. About 14.3% and 16.5% affirmed that difficulty in accessing a testing centre is a strong and very strong barrier respectively. Likewise, 11.0% (30) respondents think that unavailability of testing centres in their location wasn't a barrier, 13.6% (37) and 15.4% (42) thinks that it was a very weak and weak barrier to COVID testing respectively. About 18.8% (51) and 26.1% (71) affirmed that unavailability of testing centers was a strong and very strong barrier respectively.

In a similar turn, 9.9% (27) respondents believes that poor attitude of testing centres workers wasn't a barrier, 14.3% (39) and 12.9% (35) thinks that it is a very weak and weak barrier to COVID testing respectively. But 16.9% (46) and 19.1% (52) affirmed that it is a strong and very strong barrier respectively. Likewise, 10.7% (29) respondents believes that inability to get enlisted for testing due to tedious discouraging processes involved in getting tested is not a barrier, 13.2% (36) and 11.8% (32) thinks that it is a very weak and weak barrier to COVID testing respectively. But 16.9% (46) and 26.1% (71) affirmed that it is a strong and very strong barrier respectively.

Table 8: COVID-19 Testing Barriers

	Not	Very Weak	Weak	Neutral	Strong	Very Strong
Access to Testing Centre	44(16.2)	60(22.1)	38(14.0)	43(15.8)	39(14.3)	45(16.5)
Testing Centre Unavailability	30(11.0)	37(13.6)	42(15.4)	38(14.0)	51(18.8)	71(26.1)
PoorAttitude Of Testing Workers	27(9.9)	39(14.3)	35(12.9)	68(25.0)	46(16.9)	52(19.1)
Testing Process	29(10.7)	36(13.2)	32(11.8)	55(20.2)	46(16.9)	71(26.1)

Motivation

About 27.2% (74) respondents believe that receipt of COVID- 19 palliatives was never in any way a motivation to getting tested. Twenty seven percent (76) and 9.6% (26) think that it was a very weak and weak motivation to COVID- 19 testing respectively. But 8.8% (24) and 11.0% (30) affirmed that it is a strong and very strong motivation respectively. Likewise, 6.6% (18) respondents believe that availability and proximity to testing centres was never in any way a motivation to getting tested. About 21.0% (57) and 18.4% (50) think that it was a very weak and weak motivation to COVID- 19 testing respectively. But 19.1% (52) and 19.5% (53) affirmed that it is a strong and very strong motivation respectively. About 7.7% (21) respondents believe that availability advocacy for testing from people already tested was never in any way a motivation to getting tested. About 21.0% (57) and 18.4% (50) think that it was a very weak and weak motivation to COVID- 19 testing respectively. But 19.1% (52) and 19.5% (53) affirmed that it is a strong and very strong motivation respectively.

Table 9: COVID-19 Testing Motivations

	Not	Very Weak	Weak	Neutral	Strong	Very Strong
Receipt of Palliatives	74 (27.2)	76(27.9)	26(9.6)	39(14.3)	24(8.8)	30(11.0)
Availability & Proximity to Testing Centre	18(6.6)	57(21.0)	50(18.4)	39(14.3)	52(19.1)	53(19.5)
Access to Testing Advocacy	21(7.7)	44(16.2)	30(11.0)	65(23.9)	56(20.6)	51(18.8)

Discussion

Socio-Demographic Characteristics of the Respondents

This study was carried out among 271 respondents, majority were females (61.6%) while the males constituted (38.4%) of the respondents, a high percentage of respondents were age range 21-30year old (56.1%), the least age range of participants was 31years and above where only 27 respondents participated of which 11.5% of the total were males and 9% were females. This result is in consonance with a study in Nigeria where the mean age of the participants was 33.4 ± 11.8 years, however the majority of the Nigeria study, 53.5%, were males and 52.2% were not married in contrast to this study where the majority are females. Majority of the respondents (217) are Christians while the 51 respondents who are Muslims made up only about 18.8% of the total respondents, other religions made up about 1.1% only [6].

Considering the total number of respondents, 245 are singles with 61.6% being females, 16 respondents married with 25% being males and 6 respondents separated with 50% being females. This findings are similar to many of the literatures exhausted for this study, of note is that of a Kano, Nigeria study where 165(55%) respondents were male and the remaining 135 (45%) were female.The respondents are of various ethnic groups in Nigeria with the majority (40.2%) of the respondents belonging to the minority ethnic groups termed "other." The majority ethnic groups such as the Igbo, Yoruba, Hausa/Fulani respondents were 24.3%, 28.8% and 6.3% respectively [7]. the majority of the respondents (91.5%) have tertiary level of education while very few (5.2%) have secondary level of education, this is almost same with the Nigeria study where majority of the participants had education up to the tertiary level (88.5%).

Knowledge of COVID- 19 Testing

Among the 272 respondents sampled, 168 (61.8%) had a good knowledge of COVID- 19 testing while about 104 (38.2%) had poor knowledge of COVID- 19 testing, an outcome of the knowledge of the symptoms of the disease, ways of preventing COVID- 19 and the myths around the testing procedure [8-10]. It was realized that 214 (78.3%) had the right knowledge of the cause of the disease, 215 (79.0%) had good knowledge of the symptoms and 213 (78.3%) had good knowledge of the testing procedure however, a large proportion of about 184 (67.7%) showed a poor knowledge of the common preventive means of COVID-19. This shows a large gap of knowledge among the students. Across all age range in the study, majority of the participants had good knowledge of COVID- 19 testing. About 217 of the participants were Christians with a good knowledge of 56.2% while the Muslim population was 52 respondents with a good knowledge of 55.8%. The other religions grouped together had only 3 respondents with 66.7% having poor knowledge of COVID- 19 testing, also 58.8% of the Yoruba tribe showed poor knowledge.

In an online cross sectional study in which Chinese residents' were investigated on COVID- 19 during the rapid rise period of the outbreak using popular media in Hubei, China. The overall correct rate of the knowledge was 90%. This is higher that the outcome of this study. In a similar study in China, items about whether antibiotics or other specific medicines were effective in preventing and treating COVID- 19 were answered correctly by less than half of the participants, around 42% of the participants were not sure whether pets at home could spread COVID- 19, and about 40% were uncertain whether hand dryers were able to kill COVID- 19 virus. In an Indian study, the mean COVID-19 knowledge score of the respondents was 7.47, suggesting overall 74.7% correct rate of knowledge. More than 90% of the study participants were aware about; name & origin of the virus, incubation period, symptoms, people at high risk for serious COVID- 19 illness, mode of transmission, prevention and control. However, only half of the participants are aware about COVID- 19 not being transmitted through air. Very few participants are aware of some infected persons not developing symptoms and serious illness. Age groups less than 18 years, primary school education were significantly associated with low knowledge score ($P < 0.05$). An Afghanistan survey of a total of 213 health workers in 8 provinces, representing all regions of Afghanistan collected sufficient useful evidence to ascertain the knowledge of COVID 19 response in Afghanistan and the plight of health workers [10]. About 100% have heard about Novel Corona Virus (COVID 19), 89% have mentioned that they have participated in various discussions related to COVID -19 (92% among men and 84% among women).is quite far above the knowledge realized in the respondents of this study [11]. A survey in Egypt which was distributed among adult Egyptians, five hundred and fifty nine persons completed the survey. The mean knowledge score was 16.39 out of 23; Knowledge was significantly lower among older, less educated, lower income participants, and rural residents. In a survey in Nigeria, knowledge about the most common mode of transmission, almost all (94.10%) selected contact with droplets from an infected person/organism via breathing, sneezing, or coughing while a little above average (54.97%) picked touching contaminated objects or surfaces as a mean of transmitting and contacting the virus. In another study in Gyadi- Gyadi part of Kano state, Nigeria, majority 185 (61.7%) know COVID- 19, and also 178 (59.3%) heard COVID- 19. Regarding the origin of COVID- 19, 98 (32.7%) of the respondents answered COVID- 19 originates from bats [12,13]. Concerning transmission majority 175 (58.3%) of the respondents have answered COVID- 19 is transmitted through air, contact, fecal-oral routes. Regarding sign and symptom most of 162 (54%) of the respondents have answered Headache, fever, cough, sore throat, and flu are symptoms of COVID- 19. Concerning the way of prevention majority 175 (58.3%) answered Wearing of face mask, Hand hygiene, covering nose and mouth while coughing, and avoiding sick contacts can help in the prevention of COVID- 19 transmission.

Attitude of COVID- 19 Testing

The study shows that about 202(74.3%) had good attitude towards COVID- 19 testing while 70(25.7%) had poor attitude of COVID-19 testing [14]. Poor attitude towards COVID-19 testing to reduce transmission rate and covid-19 testing often leading to being isolated was 120(44.1%) and 113(41.7%) respectively. However the response to testing for prevention of COVID-19, COVID-19 testing often resulting in positive result and COVID-19 testing being a useful method of controlling the pandemic were found to be of good attitude with values of 219(80.5%), 165(62.0%) and 207(76.1%) respectively.

The age range of 18-20 and 21 -30 had poor attitude of 73.9% (68) and 61.2% (93) respectively however, 31year and above have good attitude of 57.1% (16) of COVID- 19 testing. The Christians and Muslims both have poor attitude of 65.4% (142) and 55.8% (29) respectively likewise the others which have poor attitude of 66.7% (2) with a significant p-value of 0.007. The Hausa/ Fulani, Yoruba, Igbo and the other minority ethnic group all had poor attitude of 61.1% (11), 67.9% (53), 71.6% (48) and 56.0% (61) respectively. The respondents with secondary level of education have good attitude of 64.3% (9) while the primary and the tertiary level of education respondents have poor attitude of 75.0% (6) and 64.9% (161) respectively.

In a study conducted among asymptomatic Latino participants (n=410) with no current/previous COVID- 19 within a religious community in Maryland, USA, When asked about attitude towards preventive behavior, about 71.2% stated they never wear masks and 85.4% mentioned they never keep social distance, a very alarming rate of poor attitude compared to the outcome of this study. However, another USA study showed that majority of the respondents had high levels of attitudinal adherence with the use of precautionary measures (e.g., social distancing, use of face coverings) in comparison with this study which has an overall good attitude. In another study, Majority of all the students (91.61%) in India positively agreed to the ways of preventing COVID- 19 as prescribed by WHO [15,16]. These precautionary measures are, cleaning hands with alcohol-based sanitizer, avoid personal contact and maintaining at least 1 m distance (Social distancing). In a survey conducted among the general population of Iran above 15 years of age, a total of 8591 participated. Regarding the attitude towards COVID- 19, an overall attitudinal score of 90% and 89% of the total score were achieved among the given population.

In a study in Sierra Leone, a bit more than half of the respondents (57%, 95% CI 50.9% to 63.0%) affirmed a good attitude of taking action to avoid COVID- 19 infection. More men than women reported doing so (men: 60%, 95% CI 52.9% to 66.4% vs women: 54%, 95% CI 47.4% to 60.6%). The most commonly mentioned action taken was washing hands with soap and water more often (87%, 95% CI 81.9% to 90.5%). This outcome is similar to the findings of this study however; more women are reported in this study [17-19]. Also, in a study in Egypt, the majority of the participants had a positive attitude towards different items of the inquired preventive measures, which is same with this study where a majority had positive attitude in about 74.3% of participants. In

a cross-sectional community-based study for bi-national survey of Egypt and Nigeria, participants' attitude towards COVID- 19 was satisfactory as the mean attitude score was 6.9 ± 1.2, with a range of 2 to 9. Most of the respondents (68.9%, n = 990/1437) had a positive attitude towards protective measures being advised by the WHO or their local health authorities [20]. Most respondents (81%, n = 1164/1437) valued the importance of proper hygiene, self-isolation, the use of face mask when going out, and the ideal distance between two people in curbing the spread of the virus, showing the validity of our findings in this study of an overall good attitude.

Perception of COVID- 19 Testing

Good perception of COVID- 19 testing was seen in 163 (59.9%) participants while about 40.1% of respondents have poor perception of COVID- 19 testing in the studied population while being asked about the cause of Cocid-19, if COVID- 19 is transmissible and whether testing of people on COVID- 19 can cause them to be infected [21]. About 143(52.6%) had a good perception of cause of COVID-19 infection, 255(93.8%) had a good perception of COVID-19 transmission however, 77(28.3%) had the perception that people get infected with COVID-19 while being tested, compare to a USA study where the different levels of COVID- 19 risk perceptions of positive and negative patients was noticed to be (99.1%) and (89.5%) poor perception ($p<0.001$) respectively. Nevertheless, the negative patients had a better perception of the risk of COVID- 19 at the level of their neighborhood and the USA compared with positive patients ($p<0.05$). In a similar study in the USA among oncology patients, Among the 174 patients who participated, 35% of the sample indicated that they were very (3.4%) or somewhat (30.6%) likely to contract COVID- 19 and 33.5% indicated that they were very likely to survive if infected with the virus [15]. In terms of worries, 19.5% and 54.6% were very worried or somewhat worried, respectively, that family members would become infected with COVID- 19 while 13.6% were unemployed because of COVID- 19, over 55% of the patients were confident that their primary care provider could diagnose COVID- 19.

In the Fang Cang hospital, Wuhan, participants in an online survey perceived risk of acquiring COVID- 19 (42%), quite lower than that of influenza infection (61%) but higher in comparison with other adverse health conditions [16]. This is also lower that the perceived risk of this study which is about 59.9%. Middle-aged and older participants (44%) reported slightly higher level of perceived risk of COVID- 19 infection as compared to young participants (40%). Furthermore, a substantial proportion of participants were concerned about family members (86%) and other people (77%) contracting COVID- 19 which is the same concern of participants on this study. There was no correlation between risk perception and other demographic variables.

A similar study in India showed that few above average number of the respondents shown a correct rate of perception (57.6%) towards COVID- 19 [9]. Respondents aged more than 40 years; higher education level, living in urban areas, and pursuing healthcare profession were positively associated with high perception score towards COVID- 19, a similar outcome of this study [10].

A study in Sierra Leone showed outcome of 75% of the respondents felt at moderate or great risk of contracting coronavirus, a much better perception than this study This is the same outcome in most participants (86.9%) in an Egyptian study, where they were concerned about the risk of infection.

In a previous Nigeria study, Most of the participants (84.1%) did not have a self-perceived risk of contracting COVID- 19 [18-21]. Most Predictors of self-perceived risk of COVID- 19 were age 40-59 years (OR 2.05, CI 1.217-3.435), ≥ 60 years (OR 4.68, CI 1.888-11.583) and visiting crowded places (OR 2.27, CI 1.499-3.448). Their perceptions of COVID- 19 bear implications across public health initiatives, compliance with precautionary behavior as well as bilateral relations with foreign nations. 13 Therefore, it's a great improvement to know that there is increased good perception of the disease [22].

Barriers and Motivations to COVID- 19 Testing

The study shows that 16.2% (44) thinks that difficulty accessing a testing centre for COVID- 19 is not a barrier however, 22.1% (60) and 14.0% (38) thinks that it is a very weak and weak barrier to COVID testing respectively. About 14.3% and 16.5% affirmed that difficulty in accessing a testing centre is a strong and very strong barrier respectively. This leaves a large percentage considering this factor as a barrier. Same happened to unavailability of testing centres in their location where about 11.0% (30) respondents thinks that it is not a barrier, 13.6% (37) and 15.4% (42) thinks that it is a very weak and weak barrier to COVID testing respectively. About 18.8% (51) and 26.1% (71) affirmed that unavailability of testing centres is a strong and very strong barrier respectively. Also, 10.7% (29) respondents believes that inability to get enlisted for testing due to tedious discouraging processes involved in getting tested is not a barrier, 13.2% (36) and 11.8% (32) thinks that it is a very weak and weak barrier to COVID- 19 testing respectively. But 16.9% (46) and 26.1% (71) affirmed that it is a strong and very strong barrier respectively. These findings are almost same with the findings of the USA study and the Ethiopia study on barriers and motivations to COVID-19 testing.

About 27.2% (74) respondents believe that receipt of COVID- 19 palliatives was never in any way a motivation to getting tested [23-26]. 27.9% (76) and 9.6% (26) think that it is a very weak and weak motivation to COVID- 19 testing respectively. But 8.8% (24) and 11.0% (30) affirmed that it is a strong and very strong motivation respectively. Likewise, 6.6% (18) respondents believe that availability and proximity to testing centres was never in any way a motivation to getting tested. About 21.0% (57) and 18.4% (50) think that it is a very weak and weak motivation to COVID- 19 testing respectively. But 19.1% (52) and 19.5% (53) affirmed that it is a strong and very strong motivation respectively. About 7.7% (21) respondents believe that availability advocacy for testing from people already tested was never in any way a motivation to getting tested. About 21.0% (57) and 18.4% (50) think that it is a very weak and weak motivation to COVID- 19 testing respectively. But 19.1% (52) and 19.5% (53) affirmed that it is a strong and very strong motivation respectively.

Conclusion

The perception, knowledge and attitude of people to COVID- 19 bear implications across public health initiatives, compliance with precautionary behavior as well as the fight against the spread of the disease. There is a need to improve on COVID- 19 education through the use of the various ethnic languages and as well advocate for such education in places of worships by our religious leaders. Much attention should be given to the education of the masses about the common means of preventing the promiscuous spread of the disease as the outcome of this study has shown a large lacuna in effective means of preventing COVID-19 spread. The improvement in the outcome of this battle as seen by the reduction in the daily new cases confirmed by the testing facilities

is an indication of the improvement in the perception, knowledge and attitudinal practices of the larger population. As this indices improves, larger population would volunteer to be tested, thereby curbing the issues of spread especially from the asymptomatic careers, and also a reduction in the burden of the disease through a steady decline in the morbidity and mortality.

It is essential to expand disease advocacy programs through various media channels to reach a broader audience, as this directly impacts the effectiveness of the fight against the disease. The same approach should be implemented in religious gatherings and places of worship. The government must identify and address the barriers revealed in the study, making concerted efforts to target populations where interventions are most needed. Information about COVID-19 prevention should be adapted across different media platforms to educate the general public, particularly emphasizing the importance of reducing the disease's prevalence, especially in individuals with comorbidities. Educational initiatives should be launched in schools, and health talks should be intensified in common languages to raise awareness among the public, particularly those with limited formal education. This will help convey the seriousness of COVID-19 and promote greater acceptance of vaccination. Additionally, government programs should focus on providing free treatment for confirmed cases, encouraging individuals with symptoms to seek testing and treatment without hesitation.

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