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Original Article

Knowledge, Attitude and Practices associated with the use of face mask in prevention of Covid-19 among students of a private tertiary Institution in Nigeria

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Background: The World Health Organization recommends using a face mask to prevent infection with the coronavirus illness 2019 (COVID-19). Students are often nonchalant about maintaining physical or social distance from their peers, undermining the necessity of wearing a face mask both inside and outside of the classroom. The purpose of this study was to determine the students' knowledge, attitudes, and practices about the use of face masks at Novena University in Ogume, Delta State, Nigeria. **Methodology:** This was a descriptive cross-sectional study carried out among 400 sampled students. A self-administered questionnaire was used to collect the data while descriptive and inferential statistics were used to analyze the data at a significance level set at $p<0.05$. **Results:** About 220(55.0%) of the responders were between the ages of 21-25 years, and 260(65.0%) were females. The majority of responders, 340 (85.0%), had a good understanding of how to utilize a face mask. However, both attitudes towards using face masks 280(70.0%) and face mask usage 340(85.0%) were poor. The following demographic characteristics were shown to be substantially linked with knowledge, attitude, and use of face masks: age, sex, marital status, level of study, and religion at $p<0.05$. **Conclusion:** The majority of the respondents had an adequate understanding of how to use a face mask, a negative attitude about using a face mask, and poor practice of using a face mask to prevent COVID-19 infection. The study recommends the need for public health enlightenment campaign and education on the value and correct face mask usage among students in tertiary institutions.

Keywords: *Attitude, COVID-19, Face mask, Knowledge, Practice, Students*

Introduction

The brand-new Coronavirus Disease 2019 (officially known as SARS-CoV-2 or COVID-19) is a global pandemic that has become a public health concern.[1] The coronavirus disease (COVID-19), which is an acute respiratory illness, is a communicable and pathogenic viral infection caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and it first appeared in Wuhan, Hubei Province, China, in December 2019. The outbreak was labeled a Public Health Emergency of International Concern by the World Health Organization on the 30th of January and a global pandemic on the 11th of March 2020.[2] The virus spreads mainly between persons through their respiratory droplets, which are produced when someone who is infected sneezes or coughs, or sometimes by touching contaminated objects or surfaces and then touching their nose, mouth, or eyes.[3-4]

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COVID-19 manifests as fever, dry cough, dyspnoea, fatigue, malaise, and shortness of breath.[5] Infected asymptomatic individuals can spread the disease within 5-6 days of the incubation period. The virus can live for up to 5 days on surfaces, depending on the surface type.[6] Since the virus's 2019 outbreak, current estimates show over 238 million people have been confirmed to be infected worldwide. In Africa, there have been approximately 6 million confirmed cases.[7]

Nigeria reported its index case of COVID-19 on the 27th of February 2020. Currently, there are over 200 thousand laboratory-confirmed cases of COVID-19 and over 9000 deaths in all 36 states of Nigeria, including the Federal Capital Territory.[8] Controlling the virus's spread, the federal government of Nigeria came up with various confinement measures, including the closure of all primary, secondary, and tertiary institutions, to prevent the virus from infecting employees and students. Consequently, the closure brought huge negative consequences to Nigeria's tertiary education, as millions of students had their semester canceled or suspended.[1,9] However, once school reopened in October 2020, it became imperative for control measures to be put in place to stop the infection from spreading. Compulsory usage of face masks in public places, hospitals, and schools is one of the Nigerian government's non-pharmacological preventive strategies.[10] Face masks are a type of personal protective equipment used to prevent the spread of respiratory infections, and they may be effective at helping to prevent the transmission of respiratory viruses and bacteria and are recommended to control COVID-19 transmission.[6,11-13] A study in the US provides evidence that face masks in public resulted in a greater decline in daily COVID-19 growth rates in states that required face mask use compared to states that did not issue such mandates.[14] A study by Duong *et al*.[10], demonstrated that study participants had a strong understanding of how to use a face mask, a positive attitude toward using a face mask, and practiced using a face mask. There is a paucity of research in Nigeria on the correct usage of face masks in terms of knowledge, attitude, and practice. However, because it is one of the most obvious and readily available preventive strategies, measuring students' knowledge, attitude, and practice of wearing a face mask is critical. Its implementation would have a considerable impact on the virus's spread within the school setting. As a result, the purpose of this study was to investigate the students' knowledge, attitudes, and practices about the usage of face masks in the prevention of COVID-19 among students at Novena University in Ogume, Delta State, Nigeria.

Materials and method

To investigate the knowledge, attitude, and practice associated with the use of face masks in the prevention of COVID-19, a descriptive cross-sectional study design was adopted among students of Novena University, Ogume, Delta State from April to June 2021. Novena University is the first private University in Delta State, established in 2005. College of Health Sciences, College of Management and Social Sciences, and College of Natural and Applied Sciences are the three functional colleges that make up the university at the time the study was carried out. The study's participants were current Novena University students at the 100-400 level.

Inclusion criteria

The inclusion criteria include:
The selected students must be registered undergraduate students of any of the institution's colleges and departments.
They must willingly agree to take part in the research.

Exclusion criteria

The exclusion criteria include:
Students that are not registered at Novena University.

Post-graduate students
Students who refused to participate in the study because they did not give their consent.

Estimation of sample size: Yaro Yamane's formula for determining sample size for calculating proportion in a finite population was used to calculate the minimum sample size. [15]

$$n = \frac{z^2pq}{d^2}$$

n= the minimum sample size
Z= 1.96 at 95% confidence interval
P= 76.5% i.e., use of face mask.[10]
q= 1-P
d= degree of accuracy desired (0.05).

$$n = \frac{1.96^2 x 0.765(1-0.765)}{0.05^2}$$

n= 276

Though the minimum sample size was 276, four hundred questionnaires were administered.

To ensure a representative sample a multistage sampling technique was used. The University was clustered into the three functional Colleges of Health Sciences, Natural and Applied Sciences, and Management and Social Sciences. A total of twelve departments were chosen at random from each college comprising four from Natural and Applied Sciences, Management and Social Sciences, and Health Sciences. A total of 400 people were chosen at random from the twelve departments. Data was collected using a semi-structured self-administered questionnaire that asked about socio-demographic characteristics, knowledge of the use of face masks in the prevention of COVID-19, attitude toward the use of face masks in the prevention of COVID-19, and practice of using face masks in the prevention of COVID-19. The knowledge, attitude, and practice of utilizing face masks in the prevention of COVID-19 were the outcome factors. The knowledge questions were asked and the participants in the research were expected to provide answers of Yes, No, and Don't Know. A higher knowledge score suggested that participants in the research were well-versed in the usage of face masks to prevent COVID-19 while attitude was measured on a two-point scale of Agree or Disagree and a higher attitude score indicated a positive attitude towards using a face mask to prevent COVID-19. Practice questions were asked and the participants in the research were expected to provide answers of Yes, No, and Don't Know. A higher practice score indicated the good practice of using face masks in the prevention of COVID-19. Data were analysed using IBM SPSS statistics and displayed as frequencies and percentages. The Chi-Square test was used to examine the relationship between demographic characteristics and respondent knowledge, attitude, and practice of wearing a face mask at a $p<0.05$ level of significance. The study participants' level of knowledge was examined by asking them questions about their general knowledge of face mask use. A total of ten (10) questions were asked, and one (1) point was allocated to every correct answer, thus bringing the total points to ten (10). Subsequently, the points were categorised between 0-5 as Code 1 and > 5-10 as Code 2. Respondents scoring between 0-5=Code 1 were adjudged as demonstrating poor knowledge of how to utilize a face mask and > 5-10=Code 2 as good knowledge of how to utilize a face mask. The attitude of participants concerning the use of face masks was assessed. Twelve (12) questions were asked, and one (1) point was allocated to every appropriate response, thus bringing the total points to twelve (12). Consequently, the points were categorised between 0-6 as Code 1, and > 6-12 as Code 2. Respondents that score between 0-6=Code 1 were adjudged as encompassing a negative attitude towards the use of a face mask, > 6-12=Code 2 as encompassing a positive attitude towards the use of a face mask. The practice of using face masks was measured by assessing participants' practice of face mask use. There were a total of eight (8) questions asked, and one (1) point was allocated to every correct answer, thus bringing the total points to twelve (8). Consequently, the points were categorised between 0-4 as Code 1, and > 4-8 as Code 2. Respondents that score between 0-4=Code 1 were adjudged as encompassing poor practice of face mask use, > 4-8=Code 2 as encompassing good practice of face mask use. The Department of Public and Community Health at Novena University in Ogume, Delta State, provided ethical clearance. Informed consent was obtained from the students before administering the questionnaire, and assurance of confidentiality was given.

Results

Respondents' socio-demographic characteristics

Table 1 shows that 220(55.0%) of the respondents were between the ages of 22-25, with a mean age of 23.84±4.74 while females made up about two-thirds 260(65.0%) of the participants, and 320(80.0%) were unmarried. In addition, 174(43.5%) were from the department of public and community health, while 160(40.0%) were in their 400 level, and 280(70.0%) were Christians.

Knowledge of how to use face masks to avoid COVID-19

According to Table 2, all the respondents, 400(100.0%), have heard and know the meaning of COVID-19 with 168(42.0%) affirming the internet and social media as their information source. Also, the majority 280(70.0%) affirmed the mode of transmission to be contact routes while most

280(70.0%) knew that frequent use of a face mask prevents COVID-19 and the majority 280 (70.0%) knew that use of a face mask is good even when you lack COVID-19.

In Figure 1, the majority, 340(85.0%), demonstrated good knowledge of how to use a face mask to avoid COVID-19, while 60(15.0%) demonstrated poor knowledge of how to use a face mask to avoid COVID-19.

Attitudes on the use of face masks to avoid COVID-19 infection

As shown in Table 3, the majority, 380(95.0%), agreed that they do not like being forced to use a face mask over their face. In comparison, only 60(15.0%) agreed to enjoy putting on a mask every day, and a large number, 340(85.0%), disagreed that putting on a face mask is ineffective in COVID-19 prevention. In addition, the majority, 340(85.0%), agreed that they like putting on face masks because they provide a true sense of security against COVID-19, while 320(80.0%) disagreed that they do not like putting on face masks because they force you to touch your face all the time and most 340(85.0%) agreed that they find it hard to develop the habit of putting on a face mask.

Practice using face masks to prevent COVID-19

Table 4 shows that almost all of the 360(90%) respondents affirmed that to protect themselves from COVID-19, they should use a face mask in public locations, while 320(80.0%) said they do not engage in hand washing before wearing and after removing the face mask and 300(75.0%) affirmed that they do wear their face masks both inside and outdoors. In addition, nearly two-thirds of the respondents 260(65.0%) agreed that they do lower their face masks slightly to the chin when speaking, while 280(70.0%) affirmed that they do throw disposable medical masks into the trash after use, and only 40(10.0%) affirmed to changing their disposable masks every 4 hours.

Age, sex, marital status, level of education, and religion were all significantly associated with knowledge, attitude, and practice, according to Table 5.

Figure 2 reveals that the majority of the respondents, 280 (70 percent), exhibited a negative attitude toward using a face mask to prevent COVID-19 infection. In contrast, 120(30.0%) said they exhibit a positive attitude toward face masks to prevent COVID-19. Furthermore, the majority of the respondents 340(85.0%) had a poor practice of using face masks in the prevention of COVID-19, and 60(15.0%) demonstrated a good strategy of employing face masks in the prevention of COVID-19.

Table 1: Sociodemographic characteristics of respondents (N=400)

	Frequency	Percent (%)
Age (years)		
<20	80	20.0
21 – 25	220	55.0
26 – 30	40	10.0
≥31	60	15.0
Sex		
Male	140	35.0
Female	260	65.0
Marital status		
Married	80	20.0
Unmarried	320	80.0
Department		
Biological Science	16	4.0
Computer science	26	6.5
Energy & Petroleum Studies	18	4.5
International relations	12	3.0
Mass communication	90	22.5
Medical laboratory science	6	1.5
Public and Community Health	174	43.5
Political science	22	5.5
Sociology	16	4.0
Others	20	5.0
Level		
100	60	15.0
200	100	25.0
300	80	20.0
400	160	40.0
Religion		
Christian	280	70.0
Muslim	80	20.0
Traditional	20	5.0
Others	20	5.0

Mean age: 23.84±4.74

Table 2: Knowledge of how to utilize face masks to avoid COVID-19

	Frequency	Percent (%)
Have you heard about COVID-19		
Yes	400	100.0
No		
If yes, what is the whole meaning of COVID-19		
Coronavirus disease-19	400	100.0
Sources of Information		
Family & Friends	56	14.0
Internet & social media	168	42.0
Media	92	20.0
Place of Worship	42	12.0
Healthcare provider	42	12.0
What is the mode of transmission of COVID-19		
Contact Routes	280	70.0
Respiratory droplets	100	25.0
Don't Know	20	5.0
Frequent wearing of face masks prevents COVID-19		
Yes	280	70.0
No	60	15.0
Don't Know	60	15.0
Wearing of face mask protects against COVID-19		
Yes	300	75.0
No	40	10.0
Don't Know	60	15.0
A cloth face mask is effective as a regular surgical face mask or N95 in limiting the spread of COVID-19		
Yes	80	20.0
No	260	65.0
Don't Know	60	15.0
Wearing a face mask is good even when you do not have COVID-19		
Yes	280	70.0
No	80	20.0
Don't Know	40	10.0
Infected individuals wearing a mask reduce the risk of spreading the COVID-19 to others		
Yes	360	90.0
No	20	5.0
Don't Know	20	5.0
Can widespread use of face masks in a population facilitate the control of COVID-19		
Yes	360	90.0
No	20	5.0
Don't Know	20	5.0
For proper wearing, the face masks should cover the nose, mouth, and chin		
Yes	360	90.0
No	20	5.0
Don't Know	20	5.0
To which category of people are face masks useful		
Everyone in a public area	360	90.0
Health workers only	20	5.0
Patients with COVID-19 only	20	5.0
Surgical masks should be used only by health workers to prevent COVID-19		
Yes	80	20.0
No	100	25.0
Don't Know	220	55.0

Table 3: Attitudes on the use of face masks to prevent the spread of COVID-19

	Frequency	Percent (%)
I do not like being forced to wear a face mask		
Agree	380	95.0
Disagree	20	5.0
I enjoy wearing a face mask every day		
Agree	60	15.0
Disagree	340	85.0
I do not wear a face mask because they are ineffective in the prevention of COVID-19		
Agree	60	15.0
Disagree	340	85.0
I like wearing face masks because they provide a true sense of security against COVID-19		
Agree	340	85.0
Disagree	60	15.0
I do not like wearing face masks because they force you to touch your face all the time		
Agree	80	20.0
Disagree	320	80.0
I find it hard to develop the habit of wearing a face mask		
Agree	340	85.0
Disagree	60	15.0
Wearing a face mask is too much of a problem		
Agree	340	85.0
Disagree	60	15.0
Wearing a face mask makes me look ugly or weird		
Agree	40	10.0
Disagree	360	90.0
Wearing a face mask makes me feel uneasy		
Agree	340	85.0
Disagree	60	15.0
I always find it difficult to breathe when wearing a face mask		
Agree	280	70.0
Disagree	120	30.0
Wearing a face mask always causes overheating problems for me		
Agree	280	70.0
Disagree	120	30.0
I always find it challenging to communicate when wearing a face mask; that is why I do not like wearing it		
Agree	220	55.0
Disagree	180	45.0

Table 4: Practice the use of face masks in the prevention of COVID-19

	Frequency	Percent (%)
Do you wear a face mask in public places to protect yourself against COVID-19		
Yes	360	90.0
No	20	5.0
Don't Know	20	5.0
Do you wash your hands before wearing and after removing the face mask		
Yes	60	15.0
No	320	80.0
Don't Know	20	5.0
Do you wear your face masks both indoors and outdoors		
Yes	60	15.0
No	300	75.0
Don't Know	40	10.0
Do you lower your face mask slightly to the chin when speaking		
Yes	260	65.0
No	140	35.0
Do you throw disposable medical masks into the trash after use		
Yes	280	70.0
No	120	30.0
Do you change your disposable masks every 4 hours		
Yes	40	10.0
No	340	85.0
Don't Know	20	5.0
The cloth mask should be washed every day		
Yes	300	75.0
No	60	15.0
Don't Know	40	10.0
Do you touch the face mask while in use		
Yes	340	85.0
No	40	10.0
Don't Know	20	5.0

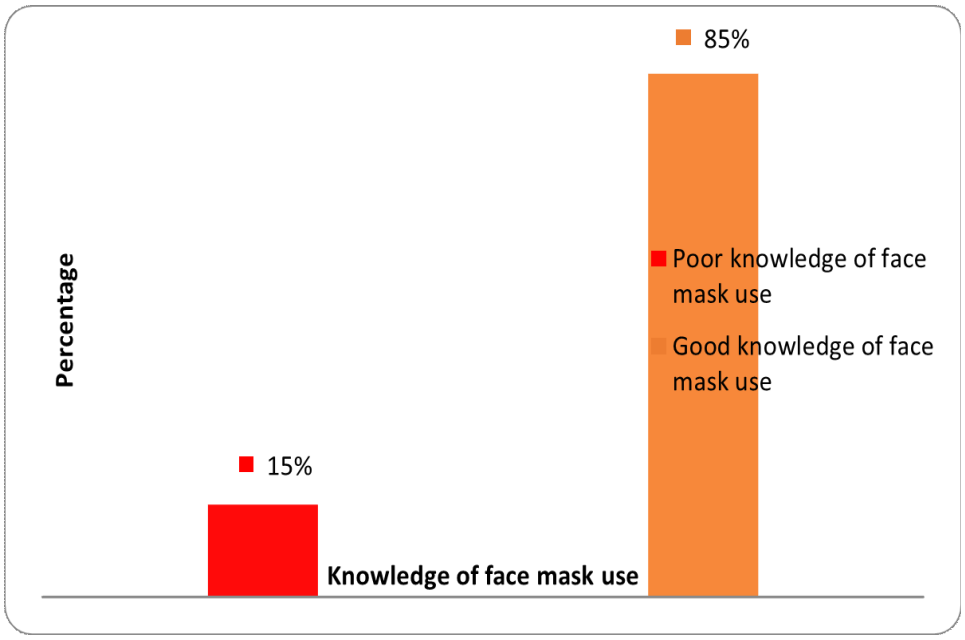

Figure 1: Knowledge of the use of face masks in the prevention of COVID-19

Table 5: Association between demographic factors and knowledge, attitude, and practice of use of face mask

Variables	Knowledge		P-value	Attitude		P-value	Practice		P-value
	Poor n (%)	Good n (%)		Negative n (%)	Positive n (%)		Poor n (%)	Good n (%)	
Age (Years)									
<21	0(0.0)	80(20)	0.000	80(20)	0(0)	0.000	20(5)	60(15)	0.000
21-25	0(0.0)	220(55)		200(50)	20(5)		200(50)	20(5)	
26-30	0(0.0)	40(10)		0(0)	40(10)		40(10)	0(0)	
>31	30(7.5)	30(7.5)		0(0)	60(15)		60(15)	0(0)	
Sex									
Male	20(5)	120(30)	0.000	120(30)	20(5)	0.000	80(20)	60(15)	0.000
Female	60(15)	200(50)		140(35)	120(30)		40(10)	220(55)	
Marital status									
Married	0(0)	80(20)	0.000	80(20)	0(0)	0.000	20(5)	60(15)	0.000
Unmarried	60(15)	260(65)		200(50)	120(30)		300(55)	20(5)	
Level									
100	10(2.5)	50(12.5)	0.000	50(12.5)	10(2.5)	0.000	10(2.5)	50(12.5)	0.000
200	0(0)	100(25)		100(25)	0(0.0)		100(25)	0(0.0)	
300	20(5)	60(15)		80(20)	0(0.0)		80(20)	0(0.0)	
400	60(15)	100(25)		40(10)	120(30)		140(40)	20(5)	
Religion									
Christian	40(10)	240(60)	0.000	200(50)	80(20)	0.000	220(55)	60(15)	0.000
Muslim	20(5)	60(15)		20(5)	60(15)		60(15)	20(5)	
Traditional	10(2.5)	10(2.5)		10(2.5)	10(2.5)		20(5)	0(0.0)	
Others	10(2.5)	10(2.5)		10(2.5)	10(2.5)		10(2.5)	10(2.5)	

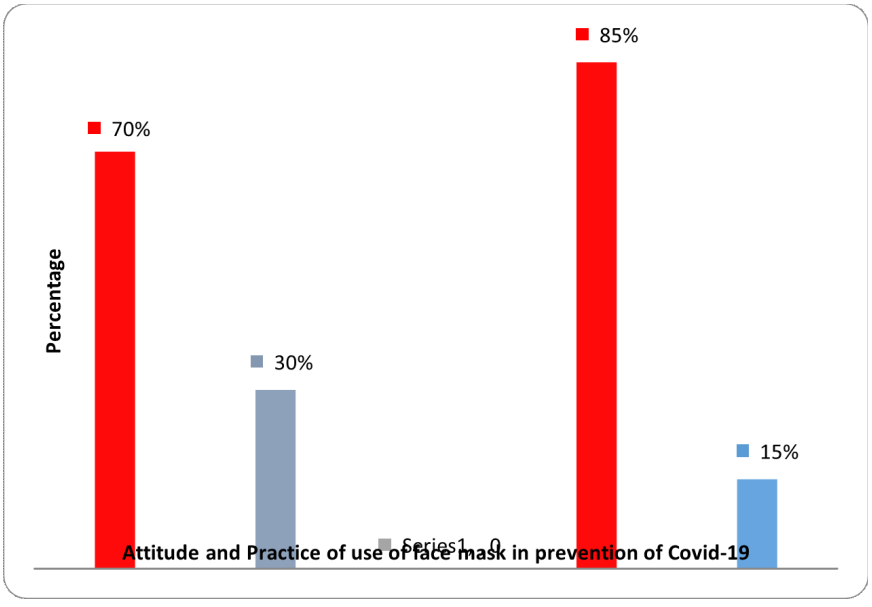

Figure 2: Attitude and Practice of use of face mask in the prevention of COVID-19

Discussion

The purpose of this study was to investigate the knowledge, attitude, and practice of students at Novena University in Ogume Delta State, Nigeria, when it came to using face masks to avoid COVID-19. According to the findings of the study, all the respondents affirmed to have heard of COVID-19 and were able to give the whole meaning of COVID-19 as coronavirus disease 2019. The finding was similar to a study in Uganda, where almost all respondents were aware of COVID-19.[16] In addition, the respondents' main sources of information about COVID-19 were the internet and social media,

media, and family and friends. The internet and social media are very strong influencers among students in this modern-day. People own smartphones that can access social media, so it is not surprising that it was the primary information source of COVID-19 among students. The majority of the students were aware of COVID-19's transmission mode, the importance of frequent face mask use in COVID-19 prevention, N95, and regular surgical face masks as more effective in limiting COVID-19 spread, and the widespread use of face masks in a population to facilitate COVID-19 control. The overall knowledge of the use of a face mask in the prevention of COVID-19 reveals that 85% of respondents had a good understanding of the use of a face mask in the prevention of COVID-19. This discovery presents a chance to maintain knowledge while improving perception, attitude, and practice of using a face mask. The finding was consistent with that of other studies that reported a relatively good understanding of face mask use.[6,10,13] A Nigerian population study also showed a good understanding of face mask utilisation among the sampled respondents.[17]

The respondents' attitudes on the use of face masks in the prevention of COVID-19 show that they dislike being forced to wear one. They disagree that using a face mask every day is enjoyable and that developing the habit of doing so is difficult. The majority of respondents (70%) had an unfavourable attitude about the use of face masks. This data indicates a gap in their behavioural intention to use a face mask, which could have serious health implications. This finding was comparable to that of a study of healthcare personnel in Addis Ababa, Ethiopia, who were asked about their knowledge, attitudes, and use of face masks. It found that more than half of their respondents (54.7%) had an unfavourable view regarding the use of face masks.[18] However, other population-based studies in Ethiopia, Uganda, and Saudi Arabia reported a favourable view towards using face masks among their respondents.[13,19,20] The variation in findings could be attributed to the time of data collection. For instance, two of the studies [19,20] collected their data in the year 2020 when the pandemic was still at its peak and therefore could influence their attitude towards face mask usage when compared with the current research which collected its data in 2021 at a time when the pandemic curve has been flattened in most countries.

Furthermore, the vast majority of those who took part in the study exhibited poor practices of the use of a face mask to prevent COVID-19 infection, as the majority of people do not wash their hands before or after wearing a face mask. When speaking, they lower their face mask slightly to their chin, and they touch their face mask while it is on. Overall, 85% of the responders had a poor practice of how to wear a face mask to prevent COVID-19. The finding implies that the respondents might constitute a risk for COVID-19 transmission to themselves at the intrapersonal level and the interpersonal level to friends, family members, the institution of study, and the immediate community. This is because COVID-19 can be transmitted in the asymptomatic and presymptomatic states. However, the finding was different from that of other population-based studies in Ethiopia, the United Arab Emirates, and Poland that reported good practice of how to use a face mask among their respondents.[13,21-22] This observed difference could be attributed to different study populations and periods of data collection.

Knowledge, attitude, and use of face masks were significantly linked with demographic characteristics such as age, sex, marital status, level of study, and religion. In addition, a previous community study in Saudi Arabia did not report any significant difference between age and knowledge of the use of face masks but reported a significant difference between age and attitude.[20] As previously stated, the apparent disparity in study findings could be related to differences in study populations. However, it would be expected that respondents at a higher level of study would know how to utilize face masks, have a positive attitude, and have practiced using them. This was supported by the study's findings, which revealed a significant variation in respondents' knowledge, attitude, and use of face masks in class. Thus, health promotion programs promoting face mask usage could target these demographic factors. Also, sex showed a significant difference in face mask usage knowledge, attitude, and practice. Other population-based studies in Ethiopia and Saudi Arabia did not report any difference between sex and knowledge of face mask usage.[19,20] Females, on the other hand, were more likely to have strong knowledge, a positive attitude, and good practice of using face masks. Furthermore, unmarried respondents were more likely than married respondents to have a strong understanding

and a positive attitude toward using a face mask. However, considering that the proportion of unmarried respondents was more than married respondents, the observed finding was likely. A previous population-based study in Uganda did not show any difference between marital status and knowledge of face mask usage.[19] Furthermore, knowledge of how to use a face mask was linked to a positive attitude about the usage of face masks and the use of face masks. The findings were comparable to those of a study conducted in Southern Ethiopia, which found that both demographics and knowledge were significantly related to the attitude and use of face masks.[23]

The study's findings indicated that, despite the respondents' high awareness of the use of face masks, this information did not translate into a positive attitude or good practice of face mask use in the prevention of COVID-19. This could have severe health implications as many of the study participants might be reluctant to use face masks within and outside the school environment, making them vulnerable to COVID-19 infection and a high-risk cohort for COVID-19 infection within the general population. This could lead to an increase in the prevalence of COVID-19 infection both inside and outside of schools.

Conclusion

The majority of the respondents had an adequate understanding of how to use a face mask, a negative attitude about using a face mask, and poor practice of wearing a face mask to prevent COVID-19 infection. Age, sex, marital status, level of education, and religion were all found to be significantly associated with knowledge, attitude, and use of face masks. Furthermore, among the students, knowledge was significantly associated with attitude and practice of using a face mask to prevent COVID-19.

Recommendation

To prevent the spread of COVID-19, a public health awareness campaign and education on the importance and proper use of face masks for students are required, as well as policies to encourage students to use face masks, as well as other measures such as social distancing, hand washing, and continuous testing.

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Conflict of Interest: None to declare

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