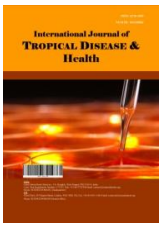

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Face Mask Utilization in the Era of COVID-19: Nigeria Experience

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Authors' contributions

This work was carried out in collaboration among all authors. Authors AIW and CKE contributed to all parts of the study. Author AMH contributed to the conception and revising the manuscript. Author OR contributed to the collection, analysis and interpretation of data. Authors AFF and VAK contributed to the conception, design, review of analysis and revising the manuscript. All the authors read and approve the final manuscript.

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ABSTRACT

Background: The use of face masks has been accepted and recommended globally as a tool for COVID-19 protection. The government of Nigeria made wearing of face masks compulsory in public

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places. However, no evidence has shown user compliance or knowledge. This study investigated the knowledge and utilization of face masks among the Nigerian population.
Methods: This was a web-based cross-sectional survey conducted from July 2 to August 28, 2020, using a convenience sampling technique. This was in adherence to the Nigeria Centre for Disease Control (NCDC) guideline of physical/social distancing. Data was collected using a pre-tested questionnaire. Descriptive statistics were used to present the results.
Results: A total of 811 respondents participated in the survey with the mean age of 36.93±12.17 years. Almost all the respondents 91.9% and 94% were aware that face masks can reduce the spread of COVID-19 and should be worn in the public respectively. 95.3% of the participants had used a face mask as a protection against COVID-19. Furthermore, 90.2% used face masks in the public, 53% used it when entering restricted places, 45.5% when with a suspected case and 30.7% used a mask due to fear of arrest/punishment. The majority of respondents used homemade masks (70%) and 71.2% reused their masks, but maintained poor cleaning culture.
Conclusion: This study demonstrated adequate knowledge and utilization of face masks among the population. The homemade mask was mostly used. However, there was a poor mask cleaning culture among the population. There should be intensive public awareness campaigns through social and mass media on how to clean reusable face masks.

Keywords: Face mask; knowledge; utilization; COVID-19; Rivers State; Nigeria.

ABBREVIATIONS

RSHREC : Rivers State Health Research Ethics Committee
RSHMB : Rivers State Hospital Management Board
NCDC : Nigeria Centre for Disease Control
WHO : World Health Organization

1. INTRODUCTION

The use of face masks has been accepted and recommended globally as a tool for COVID-19 protection since the outbreak in China [1-2]. Though, there was an earlier debate whether to use face masks or not. This debate stemmed from the previous guidelines issued by the World Health Organization (WHO) that asymptomatic persons need not wear face masks when in public. It also advocated that the general population should not wear medical masks unless they were caregivers or had close contact with sick persons [3-5]. But, on 6 April 2020 WHO relaxed its stand on the use of face masks in the healthy population [6].

The Federal Government of Nigeria, through the Presidential Task Force and Nigeria Centre for Disease Control (NCDC) had introduced several measures to curtail the spread of COVID-19 virus and protect the health of the people since the index case was reported in Nigeria. This included an initial lockdown of non-essential activities, closure of schools and ban on international flights [7,8]. Such measures were designed to minimize person-to-person exposures, reduce the reproduction number, and thus the growth rate of the epidemic [9]. Other measures by NCDC were physical/social distancing, use of face masks at public places and frequent handwashing with soap or the use of an alcohol-based sanitizer where water was unavailable [8,10].

Face masks provide a physical barrier between the mouth and nose of the wearer and potential contaminants in the immediate environment [11]. The fact that there is no approved vaccine or medication for the treatment of COVID-19 infection means that the population has to rely upon the precautionary guidelines provided by the WHO and NCDC, such as the wearing of face masks in the public to mitigate the spread of the virus. Since the Federal Government of Nigeria encouraged the wearing of face mask in the public places [12], there is no documented evidence to show the citizen's knowledge of face mask, its use and the compliance to the directive on its utilization. Therefore, this study investigated the knowledge and utilization of face masks among the Nigerian population.

2. METHODS

2.1 Study Design and Participants

The study utilized a web-based cross-sectional survey which was conducted from July 2 to August 28, 2020. In adherence to the NCDC guideline for physical/social distancing, a convenience sampling technique was used to recruit respondents, and data was collected

online via email and social media. At present, there is no documented prevalence of face mask use in Nigeria. A minimum sample size of 600 was calculated based on an estimated adult population of 100 million [13], 4% error margin and 95% confidence level using an online sample size calculator [14].

2.2 Data Collection

Data was collected with the use of a pre-tested questionnaire. The questionnaire was developed and validated by the authors. The questionnaire was divided into three sections namely, socio-demographic, knowledge on face masks use and practice relating to the use of face masks.

The socio-demographic section contained information on gender, age as at last birthday, area of residence, religion, occupation, marital status, education level, number of people in a household and average income per month. The knowledge section contained nine questions, while the practice section contained five questions. Another six questions which were multiple options were related to the perception of the respondent on the use of a face mask.

2.3 Statistical Analysis

Data was downloaded from the google form and exported into STATA version 15 (Stata Corp, College Station, TX, USA) for statistical analysis. Descriptive statistics were used to present responses for categorical variables and mean with standard deviation for age.

3. RESULTS

The mean age of the 811 respondents was 36.93±12.17 years. About two-thirds (43.8%) of the respondents were males. Almost all the respondents were Christians (94.6%), employed (84.7%), 61.1% had tertiary education and 50.8% were from households with 3 to 5 members. This is shown in Table 1.

Table 1 also showed that 95.3% of participants had used a face mask as a protection against COVID-19, and a high prevalence of face mask utilization across the background characteristics. Male and female gender had almost the same prevalence of face mask utilization (95.5% vs 95.4%), the same for married and not married (95.0% vs 95.9%). Also, there was a higher prevalence of face mask use among the age group 20-30 years (96.0%), residing in the urban against rural areas (97.6% vs 92.9%), employed against unemployed (96.1% vs 91.9%), and tertiary against below tertiary (96.8% vs 93.3%). Those who reside in a household of more than five residents had a higher prevalence of face mask utilization (97.3%) compared to other household sizes, and those who earned more than 100,000NGN monthly all used a face mask (100%) compared to others who earned 100,000NGN or less monthly.

Almost all the respondents (91.9%) knew that face masks can reduce the spread of COVID-19 when used properly, 94.6% had a face mask, 80.0% wore a face mask for protection against COVID-19. About 94% were aware that face masks should be used whenever in public. Two thirds (64.6%) stated that wearing a face mask always made them not to breathe well. Over 50.0% thought people should be forced to use the face mask, while others stated otherwise. This is shown in Table 2.

As shown in Table 3, about 95.3% of participants had used a face mask as protection against COVID-19. A proportion of 90.2% wore it when in public, 53% when entering no face mask, no entry places, 45.5% when with a suspected case, 30.7% wore it due to the fear of arrest/punishment and 2.4% wore it when alone. Most of the respondents (70.3%), used homemade (cloth or fabrics) face masks, while only 29.7% used medical face masks, 71.2% reused face masks and washing and ironing (42.2%) were the means of cleaning and disinfecting the mask. Other methods of cleaning and disinfecting the mask were only washing 26.1%, drying under the sun 18.1%, while 13.6% did not clean and disinfect their mask.

As shown in Table 4, the assessment of the perception of the respondents about face mask showed that 78.3% of the respondents felt that face mask can prevent the wearer from spreading COVID-19 if he or she already had it, 66.0% suggested that face mask will protect the wearer from being infected by COVID-19 even if social distancing is not observed. Also, 79.5% of them felt that face mask and social distancing were both necessary to avoid the spread of COVID-19 and persons can be prosecuted if they fail to wear a face mask in a public place (42.1%).

Table 1. Characteristics of study participants and utilization of face mask

Characteristics	n	%	Prevalence of face mask utilization
Gender			
Male	355	43.8	95.5
Female	456	56.2	95.4
Age as at last birthday (years)			
<20	51	6.3	94.1
20-30	225	27.9	96.0
31-40	233	28.9	94.9
41-50	202	25.0	95.5
>50	96	11.9	94.7
Mean ± SD (years)	36.93±12.17		
Areas of residence			
Rural	395	49.1	92.9
Urban	409	50.9	97.6
Marital status			
Married	462	57.5	95.0
Not married	342	42.5	95.9
Religion			
Christianity	765	94.6	95.2
Islam	34	4.2	97.1
Others	10	1.2	100
Occupation			
Employed	686	84.7	96.1
Unemployed	124	15.3	91.9
Educational level			
Below tertiary	315	38.9	93.3
Tertiary	495	61.1	96.8
Household size			
<3	109	14.5	92.6
3-5	383	50.8	94.5
>5	262	34.7	97.3
Monthly income (NGN)			
< 10,000	202	27.1	94.5
10,000 – 50,000	250	19.8	93.2
51,000 – 100,000	148	19.8	96.0
>100,000	146	19.6	100
Total	811	100	774 (95.3%)

1USD = 380 NGN

4. DISCUSSION

This study aimed at assessing the knowledge and level of face mask utilization in Nigeria as a preventive and protective strategy for the spread of coronavirus. This study was anchored on documented evidence that wearing masks can prevent or slow the spread of COVID-19 pandemic [1,2,15,16]. There is little documented work on community knowledge and utilization of face masks for COVID-19 protection in Nigeria and abroad.

In this study, the respondents demonstrated significant knowledge and awareness about the use of face masks for the prevention of COVID-19. This was evident from the fact that over ninety percent of the respondents indicated that face masks can reduce COVID-19 spread when properly used, particularly when used in the public place. This finding is higher than the result of a similar study in Pakistan that showed low use of face masks for COVID-19 protection [11]. The setting of our study might have contributed to the high level of knowledge about face masks found among the respondents.

The study revealed that a very significant proportion of the respondents used a face mask and this cuts across all the participants

irrespective of background characteristics. Our result might be influenced by increased COVID-19 awareness among the Nigerian population [17], and as evident in this study. These findings can be attributed to locations/affiliation of the researchers. Most of the researchers reside in the Southern part of Nigeria where the literacy rate is high [18,19]. The study has shown that educational level influences the community knowledge on coronavirus [17].

Most of the participants suggested that difficulty in breathing dissuaded them from wearing a face mask always and some of the participants felt that coercion could play a role in the use of face masks. The use of face masks in certain places is compulsory in Nigeria according to government policy [12]. The policy is aimed at protecting the uninfected population, those caring for the ill and/or infected persons as well as healthcare workers [20]. Like knowledge, there was a high and positive perception of the use of face masks. This study demonstrated that most of the respondents were aware of the usefulness of wearing a face mask and the danger of not wearing it. Therefore, government regulation was only a contributing factor for its usage.

Some respondents wore it when entering restricted places that were marked “no face mask, no entry” to avert arrest and punishment. The possible explanation might be that our study was dominated by literate persons and those who worked where these government directives were enforced to the letter.

Furthermore, most of the respondents used cloth or fabric face masks rather than the medical face mask. The face masks were also reused by some of the respondents. The high rate of cloth or fabric face mask usage against the medical face mask may be attributed to the high cost and shortage of medical/surgical face masks [15]. The design of homemade masks in Nigeria has also aided the mass distribution and access to masks, which of course accounted for the high proportion of face mask utilization in this study. Despite the significant knowledge demonstrated

Table 2. Knowledge about face mask as a protection for COVID-19 infection

Statements	Response	N	%
If use properly, face mask can reduce the spread of COVID-19	Yes	748	91.9
	No	66	8.1
Do you have a face mask?	Yes	771	94.6
	No	44	5.4
If no, why?	Too costly for me	20	6.5
	I see no need for it	16	5.2
	I don’t know where to get it	13	4.3
Why do you wear a face mask?	Respect for others	22	2.7
	For fashion	13	1.6
	Government made it compulsory	103	12.8
	Protection against COVID-19	645	80.0
	No opinion	23	2.8
What can make you not wear your face mask always?	I see no need for it	57	7.5
	I can't breathe well	490	64.6
	It is too hot	72	9.5
	I don't look good	22	2.9
	I am angry with the authorities	17	2.2
	I feel there is no COVID-19 where I stay or work	67	8.8
	My body is allergic to it	33	4.3
Have you heard that people should use face masks whenever they are in the public?	Yes	757	93.8
	No	50	6.2
Do you think people should be forced to use the face mask?	Yes	443	55.0
	No	362	45.0

Table 3. Practice about use of face mask as a protection for COVID-19 infection

Statements	Response	N	%
Do you wear a face mask?	Yes	774	95.3
	No	38	4.7
*If yes, when do you wear it?	Always when in public	725	90.2
	When alone	19	2.4
	When with a suspected case	366	45.5
	When I am afraid of arrest/punishment	247	30.7
	When I need entry to no face mask no entry places	426	53.0
	No opinion	21	2.6
What type of face mask do you use?	Medical	235	29.7
	Homemade (cloth or fabrics)	556	70.3
Do you reuse your face mask?	Yes	572	71.2
	No	231	28.8
How do you clean and disinfect it?	I have no need to clean and disinfect it	105	13.6
	I wash and iron it	326	42.2
	I dry it under the sun	140	18.1
	I only wash it	202	26.1

**multiple response*

Table 4. Perception about face mask as a protection for COVID-19 infection

Statements	Response	N	%
*Which of the following statements about face masks are true?	Face mask will prevent me from spreading COVID-19 if I already have it	629	78.3
	Face mask will protect me from being infected by COVID-19 even if social distancing is not observed	530	66.0
	Face mask and social distancing are both necessary to avoid the spread of COVID-19	638	79.5
	Face mask gives the wearer a false sense of protection because they do not make any difference at all	63	7.8
	You can be prosecuted if you fail to wear face mask in a public place	338	42.1
	Face masks are not necessary because COVID-19 is not real	33	4.1

**multiple response*

by the respondents about the coronavirus, results showed that there was poor cleaning and disinfecting culture among the population. A practice that can expose the respondents to the virus and other infections they were trying to mitigate.

The major limitation of the study is the utilization of self-reported web-based cross-sectional study design which limited our study coverage to only the educated people who can afford and use a smartphone from which data was collected. Therefore, our findings cannot be generalized for

the entire country. Hence a study that will reach out to the generality of the population is proposed.

5. CONCLUSION

This study demonstrated adequate knowledge and utilization of face masks among the population. Homemade masks were mostly used, although there were poor cleaning and disinfecting culture of the reused mask among the population. We suggest that measures on COVID-19 should be sustained. Also, there should be public awareness campaigns to emphasize the need to clean and disinfect the face mask before reusing it using social and mass media. We hope these would mitigate the spread of the COVID-19 virus in the Nigerian population.

CONSENT

As per international standard or university standard, Participants' written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

The study was approved by the Rivers State Health Research Ethics Committee with registration number- RSHMB/RSHREC/11.20/ VOL.8/063.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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