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Use of facemask during the COVID-19 pandemic in Southeastern Nigeria: an observational study

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ABSTRACT

The use of facemask for the control of the spread of the novel corona virus among the population has been recommended by the health authorities. This is as a result of its effectiveness in the control of various infectious respiratory diseases during past epidemics and pandemics. This observational study was carried out to assess the frequency of use, appropriateness of application, type, and the quality of the used facemasks among the residents of southeastern Nigeria during the COVID-19 pandemic and to be able to draw inference from this observation on whether facemask usage can aid in controlling the spread of the disease in the study area and the country at large. Using a two-stage sampling technique, a total of 3100 individuals were observed for the type, quality, appropriateness, and frequency of facemasks usage from both rural and urban settings in the study area. Frequency distribution tables were used to categorize and describe the observed variables, Chi-square (X2) test was used to check the association between categorical variables. Among the observed individuals, 46.4% used facemasks. The most common facemask used was cloth mask (28.6%). About 16.0% of the participants correctly used their facemasks. The highest usage was observed in the urban location (49.2%). More people used facemasks in urban areas ($p<0.001$), in the bank ($p< 0.001$), in the morning ($p< 0.001$) among the males ($p< 0.001$), and among the adolescents ($p< 0.001$). The observed rate of facemask usage, however, may not be good enough to protect the population against the spread of COVID-19, therefore adequate sensitization on the need for proper use of facemasks by the public should be prioritized.

Key words:
face mask; usage; COVID-19

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INTRODUCTION

The Coronavirus Disease 2019 (COVID-19) was first discovered in December 2019 in Wuhan, China[1]. Soon after, infections spread to other parts of the World, leading to the declaration of a pandemic. In Africa, infections have risen to about 8 million cases, with over 190,000 deaths.[2] As of September 4th, 2021, the West African sub-region accounted for around 8.7% of Africa's total COVID-19 prevalence[2], with Nigeria recording about 197,088 confirmed cases with 2,495 deaths[3]. Due to the reproduction number (R0) of SARS-CoV-23, these statistics are expected to continue rising if adequate measures are not implemented and sustained.[4-6]. The virus spreads from an infected person's mouth and nostrils in form of droplets to a susceptible host when the infected person coughs, sneezes, speaks, and breathe[7]. Evidence suggests that the virus spreads mainly between people who are in close contact with each other[8].

Given that authorized vaccinations may not confer complete protection against COVID-19, the public must continue to rely on other precautionary measures, such as wearing a facemask in public places to prevent the virus from spreading[9]. Facemask creates a physical barrier between the wearer's mouth and nose and toxins in the surrounding environment, including contaminants from his own hands[10].

According to a study of facemask usage in China during the COVID-19 pandemic by Tun et al, almost all the respondents (99%) confirmed that they made use of facemask, while the majority (73.3%) demonstrated good compliance with its usage[11]. Another study on the impact of COVID-19 on the physical and mental health of people in China and Spain reported that more than 60% of the respondents from Spain confirmed that they made use of the facemask irrespective of the presence or absence of COVID-19 symptoms[12]. A US based study on the use of facemasks during the COVID-19 pandemic reported that 75.5% of the respondents made use of facemasks[13]. In Ahvaz, Iran, Rahimi et al. (2020) investigated the prevalence of facemask usage among the residents of the city during the COVID-19 pandemic, it was observed that the prevalence of facemask use was 45.6% among the observed pedestrians[14].

The facemask is unfortunately often misused and abused in Nigeria[15]. Images showing members of the public, including healthcare personnel wearing the facemask on their jaws and necks but not covering their mouths and nostrils flooded the media. Some people merely wear facemasks over their mouths, leaving their nostrils wide open[16]. Many persons who use facemasks are seen pulling the facemasks down to their jaw to speak then pulling it up over their mouth and nose afterward. Different sorts of cloth facemasks of questionable efficacy are being hawked and sold in the streets; these facemasks are first tried on by different wearers before deciding on purchase[12]. People have also been observed to be frequently stroking the front of their facemasks in an attempt to adjust, remove, or touch their faces reflexively[15]. Some people wear the same mask for lengthy periods of time, even when it becomes damp or filthy. The Nigerian COVID-19 Presidential Task Force is concerned about the increasing misuse and abuse of facemasks, which has noticed improper, unsanitary, and ill-advised use and sharing of masks, particularly repeated fittings before purchasing from vendors[16].

Facemasks are vital for COVID-19 prevention since a significant proportion of people with COVID-19 do not display symptoms (asymptomatic), and these people can shed and circulate the virus even before they realize they are infected[17,

[7]. Currently, there has been wide adoption of facemask usage as a veritable means of combating respiratory infectious diseases including the current COVID-19 among the general and the scientific communities[18-20], if for no other reason, for the application of a mitigation measure in the face of a daunting situation[21,22]. Previous research has , however supported the efficacy of facemask application in curbing the spread of the disease[23,24]. Across different countries that have been hit by the pandemic, various compulsory or voluntary suggestions on the use of facemasks in the control of the pandemic have been put forward, many insinuations have also been projected in relation to the efficacy of facemask usage in the control of the COVID-19 pandemic. In Europe for instance, the use of facemask has been popularized, even though, the practice was once unknown to them unlike in Asia where facemask usage had been in existence as part of some culture even before the COVID-19 pandemic[25]. Facemask usage has gotten comparatively little attention in terms of societal conventions and personal connotations. Its application is intricately linked to social and cultural activities, as well as political, ethical, and health-related concerns, as well as personal and social significance[26,27].

In the light of the established importance of facemask usage in curbing the spread of COVID-19, it is important that facemask usage and everything surrounding it (quality, frequency, type of material and mode of use) among the people be accessed. This assessment will inform appropriate, health education material development and identification of policy direction for COVID-19 infection control.

METHODS

Study Design

The study employed an observational cross-sectional design. Observational studies are conducted in such a way that the researcher has no influence on the study phenomenon[28]. The researcher only observes and presents the findings from his observation in a descriptive or analytical manner[29]. The current study adopts the observational descriptive approach in order to capture the subject's behaviour in terms of facemask usage without sensitizing them. It has been observed that people tend to behave in a certain way if they are aware that they are being observed. We, therefore, observed our subjects from a distance in order to avoid response bias.

Study Area

The study was conducted in Owerri, the capital of Imo State, Southeastern Nigeria, which lies on Latitude 5.486^0N and Longitude 7.035^0E. Owerri has three different Local Government Areas- Owerri Municipality, Owerri North and Owerri West. The city has an estimated population of 401,873 people as of 2006 but projected to about 516,610 in 2015, with a total land area of 550.848 km^2 from the city[30]. Owerri is a hub of economic and industrial activities for people in and around the entire South-Eastern geopolitical zone[30]. This feature combined with the communal living characteristics of the people is an important driver of the transmission and spread of COVID-19.

Study Population

The population observed in this study were members of the public in both urban and rural communities in Owerri, going around doing their usual businesses in different settings.

Sample Size

After the population of each of the settings was estimated from information obtained from the managers of the different settings, the sample size determination table was used to determine the required sample for each of the sites[31]. Table 1

shows the estimated numbers of people in the respective study sites and the corresponding sample sizes as determined by the sample size determination table.

Table 1 Sample size estimation table

Settings	Estimated population size	Sample size
School	25,000	378
Market	5000	357
Church	1200	291
Bank	200	132
Hospital	200	132
Commuter park	800	260
Total		**1550**

Sampling

Owerri was purposively selected as the study site for being the Imo State capital, therefore a true representation of the situation in the state and other cosmopolitan areas in the country. Owerri West and Owerri North were, however, included as study sites because of their proximity to Owerri municipal and for being rural areas. In each of the study areas, one setting each (bank, hospital, school, commuter motor part, church and market) was selected as the study site.

In the various study sites, every eligible individual that visited were observed for the variables of interest, making sure not to observe an individual twice. This was done until the required sample size was arrived at.

Data Collection Tool

Data was collected using a standardized observation checklist. The checklist was designed to obtain information on the location, setting, time, gender, age category, facemask use, type of facemask, condition of the facemask and mode of facemask use of people in the study area.

On the checklist, location was described as urban and rural; and study sites were: churches, market/business premises, commuter-parks, banks, health facilities and schools. The time options included morning, afternoon and evening. Age groups observed were adolescent, adults and the elderly. The different types of facemasks listed were surgical masks, cloth masks and filtered masks. However, a space for others was also added. Another important component of the checklist was the mode of facemask use which included: correct use, uncovered mouth and nose, uncovered nose, inside out and upside down.

The checklist was tested for relevance to the subject matter, clarity and appropriateness of language, and then pre-tested in a setting and condition that is similar to that of the study area. This was done not to report results but rather to check for glitches in wording, ambiguousness, lack of clarity of instructions etc. The structure and contents of the tool were later refined in the light of weaknesses spotted during the pretesting.

Data Collection

The research assistants were positioned at strategic places around the study sites, careful enough not to allow the study candidates to be aware that they were being observed, and the researchers also ensured that no single individual was observed twice as they went around doing their usual businesses. The observers then

completed the checklist based on what they observed in each location.

Data Analysis

Data were analyzed using IBM-SPSS statistics version 21. Descriptive statistics were used to describe data collected, tables were constructed for all class variables and were all expressed as the percentage of distribution. Chi-square was used to test for the associations at 0.5 confidence interval, probability value was used for the determination of the level of associations, as such values less than 0.05 were considered significant.

Ethical Approval

Ethical approval for this study was obtained from the research and ethics committee of the School of Health Technology, Federal University of Technology, Owerri.

Demographic Characteristics and Frequency of the Use of Facemask

A total of 3100 participants were observed in terms of facemask usage (Table 2). Among the study participants, 861(27.8%) were observed from the rural areas and 2239 (72.2%) were observed from the urban areas. Observations were carried out in the various settings as follows, bank 506 (16.3%), church 290 (9.4%), commuter park 563 (18.2%), health facility 441(14.2%), market/business premises 779 (25.1%) and school 521(16.8%). The most common age group in this study was adults (62.2%). About 1777 (57.3%) of the candidates were males. Majority of the observations 1497 (48.3%) were carried out in the morning. Among the observed candidates, 1438 (46.4%) used facemasks. The most common facemasks used were cloth masks [887 (28.6%)]. About 16% of those observed correctly used their facemasks. Only 808 (26.1%) of the participants wore facemasks that appeared to be clean.

RESULTS

Table 2: Demographic Characteristics and Frequency of the use of Facemask among candidates.

Variable	Frequency (N)	Percent (%)
Location		
Rural	861	27.8
Urban	2239	72.2
Setting		
Bank	506	16.3
Church	290	9.4
Commuter Park	563	18.2
Health Facility	441	14.2
Market/Business Premises	779	25.1
School	521	16.8
Time		
Afternoon	1202	38.8
Evening	401	12.9
Morning	1497	48.3
Gender		
Female	1323	42.7
Male	1777	57.3
Age group		
Adolescent	624	20.1

Variable	Frequency (N)	Percent (%)
Adult	1927	62.2
Children	117	3.8
Elderly	432	13.9
Facemask use		
No	1662	53.6
Yes	1438	46.4
Type of facemask	n = 1438	
Cloth Mask	887	61.7
Filtered Mask	171	11.9
Surgical Mask	380	26.4
Mode of facemask use	n = 1438	
Correct Use	517	36.0
Inside Out	129	9.0
Uncovered Mouth and Nose	589	41.0
Uncovered Nose	156	10.8
Upside Down	47	3.2
Condition of facemask	n = 1438	
Clean	808	56.2
Dirty	212	14.7
worn-out	418	29.1

Rate of facemasks usage by location, settings, time, gender and age group

Table 3 depicts the rate of facemasks usage by location, settings, time, gender and age group in the study area. The overall observed facemask usage was 46.4%. More facemask usage was observed in the urban area (49.2%). The health facility was the study site in which the highest rate of facemask usage was observed (74.4%), while the least facemask usage was observed on market/business premises (20.2%). Highest rate of facemask usage was observed in the mornings (52.0%) than in any other period. Males (48.6%) used facemasks more than females (43.5%). Adolescents (47.8%) used facemasks more than other age groups.

Table 3: Rate of facemasks usage by location, settings, time, gender and age group

	Number of observation	Facemask usage	
		n	Facemask usage (%)
Overall facemasks usage	3100	1438	46.4
Location			
Rural	861	336	39.0
Urban	2239	1102	49.2
Setting			
Bank	506	363	71.7
Church	290	120	41.4
Commuter Park	563	224	39.8
Health Facility	441	328	74.4
Market/Business Premises	779	157	20.2
School	521	246	47.2
Time			
Afternoon	1202	575	47.8

	Number of observation	Facemask usage	
		n	Facemask usage (%)
Evening	401	85	21.2
Morning	1497	778	52.0
Gender			
Female	1323	575	43.5
Male	1777	863	48.6
Age group			
Adolescent	624	298	47.8
Adult	1927	914	47.4
Children	117	24	20.5
Elderly	432	202	46.8

Association between facemask usage and the demographic characteristics of candidates

Association between facemask usage and the demographic characteristics of the observed candidates is depicted in Table 4. A significant association was found between facemask usage and location (p<0.001), urban (49.2%) vs rural (39.0%) locations. More people in the bank used facemasks (71.7%), and the least usage was found in the market/business premises (20.2%). Facemasks were used more in the mornings (52.0%) than in the evenings (21.2%) (p<0.00). More males (48.6%) than females (43.5%) were also observed to use facemasks (p<0.001). Age category was also found to be significantly associated with facemask usage (p<0.001), as more adolescents (47.8%) made use of their facemasks than the elderly (46.8%) and the children (20.5%).

Table 4: Association between facemasks usage and demographic characteristics of study candidates

	Facemask usage		Total	p-value
	Yes (%) n=1438	No (%) n=1662		
Location				
Rural	336(39.0)	525(61)	861	<0.001
Urban	1102(49.2)	1137(50.8)	2239	
Setting				
Bank	363(71.7)	143(28.3)	506	<0.001
Church	120(41.4)	170(58.6)	290	
Commuter Park	224(39.8)	339(60.2)	563	
Health Facility	328(74.4)	113(25.6)	441	
Market/Business Premises	157(20.2)	622(79.8)	779	
School	246(47.2)	275(52.8)	521	
Time				
Afternoon	575(47.8)	627(52.2)	1202	<0.001
Evening	85(21.2)	316(78.8)	401	
Morning	778(52.0)	719(48.0)	1497	
Gender				
Female	575(43.5)	748(56.5)	1323	0.005
Male	863(48.6)	914(51.4)	1777	
Age group				
Adolescent	298(47.8)	326(52.2)	624	<0.001
Adult	914(47.4)	1013(52.6)	1927	
Children	24(20.5)	93(79.5)	117	
Elderly	202(46.8)	230(53.2)	432	

Association between modes of facemask usage and demographic characteristics of candidates

Table 5 depicts the association between modes of facemask usage and the demographic characteristics of study candidates. Majority of the candidates from the rural (61.9%) and urban (64.7%) areas respectively, who used facemasks, wore them wrongly. The association between location and mode of facemask usage was, however, not significant ($p > 0.005$). People wore their facemasks more correctly in the banks (41.3%) than in other study sites. Association between study sites and the mode of facemask usage was however not significant ($p > 0.005$). Though more males (37.3%) than females (33.9%) used their facemasks appropriately, the association between gender and correct facemask usage was not statistically significant ($p > 0.005$). Meanwhile, appropriate facemask usage was observed more in the evenings (40.0%) than in the afternoons (34.3%) and in the mornings (36.8%). The association between time of the day and mode of facemask usage was not statistically significant ($p > 0.005$).

Table 5: Association between modes of facemask usage with demographic characteristics of study candidates

	Mode of facemask use		Total	p-value
	Correct use(%) n = 517	Incorrect Use (%) n = 921		
Location				
Rural	128(38.1)	208(61.9)	336	0.350
Urban	389(35.3)	713(64.7)	1102	
Setting				
Bank	150(41.3)	213(58.7)	363	0.054
Church	42(35)	78(65)	120	
Commuter Park	77(34.4)	147(65.6)	224	
Health facility	124(37.8)	204(62.2)	328	
Market/Business Premises	44(20)	113(80)	157	
School	80(32.5)	166(67.5)	246	
Time				
Afternoon	197(34.3)	378(65.7)	575	0.463
Evening	34(40)	51(60)	85	
Morning	286(36.8)	492(63.2)	778	
Gender				
Female	195(33.9)	380(66.1)	575	0.188
Male	322(37.3)	541(62.7)	863	
Age group				
Adolescent	127(42.6)	171(57.4)	298	0.001
Adult	305(33.4)	609(66.6)	914	
Children	18(75)	6(25)	24	
Elderly	67(33.2)	135(66.8)	202	

Association between the condition of facemasks and the demographic characteristics of study candidates

The association between the conditions of facemasks used and demographic characteristics of study candidates is shown in Table 6. More people (58.0%) from the urban areas had clean facemasks compared to those in the rural areas (50.0%). This association was found to be statistically significant ($p<$ 0.001). While about 65.9% of the observed people in the church had clean facemasks, only 47.8% of those observed in market/business premises wore clean facemasks. The association between the study sites and the condition of facemasks was significant ($p<$ 0.001). Majority (58.6%) were observed to put on clean facemasks in the morning as against 44.7% in the evenings. Worn-out (40.0%) and dirty (15.3%) facemasks used by people were observed to be more in the evenings as against (26.1%) and (15.3%) respectively in the mornings. The association between the time of the day and the condition of the used facemask was found to be significant ($p<0.001$). More females had clean facemasks on (58.7%) compared to the males (54.5%). More males, however, had worn-out facemasks (32.3%) compared to the females (24.2%). The relationship between gender and the conditions of the facemasks was not significant ($p>$ 0.005). In the age category, children were found to wear new facemasks (75.0%) more than any other age category, while more adolescents used worn-out facemasks (36.6%) compared to the other age groups. The association between age category and the condition of the facemasks was also found to be significant ($p<0.001$).

Table 6: Association between the condition of face masks with demographic characteristics of study candidates

Variable	Condition of facemasks			Total n=1438	p-value
	Clean (%) n=499	Dirty (%) n=212	Worn out(%) n=418		
Location					
Rural	168(50.0)	39(11.6)	129(38.4)	336	<0.001
Urban	640(58.0)	173(15.7)	289(26.2)	1102	
Setting					
Bank	200(63.9)	69(19.0)	94(25.9)	363	<0.001
Church	79(65.9)	9(7.5)	32(26.7)	120	
Commuter Park	112(50.0)	42(12.8)	70(31.2)	224	
Health Facility	197(60.0)	42(12.8)	89(27.1)	328	
Market/Business	109(47.8)	19(12.1)	63(40.1)	157	
Premises					
School	145(58.9)	31(12.6)	70(28.5)	246	
Time					
Afternoon	314(54.6)	80(13.9)	181(31.5)	575	<0.001
Evening	38(44.7)	13(15.3)	34(40.0)	85	
Morning	456(58.6)	119(15.3)	203(26.1)	778	
Gender					
Female	338(58.7)	98(17.0)	139(24.2)	575	0.006
Male	470(54.5)	114(13.2)	279(32.3)	863	
Age group					
Adolescent	160(53.7)	29(9.7)	109(36.6)	298	<0.001
Adult	539(58.9)	140(15.3)	235(25.7)	914	
Children	18(75.0)	0(0)	6(25)	24	
Elderly	91(45.1)	43(21.3)	68(33.7)	202	

DISCUSSION

This study was conducted to observe the facemask usage rates and habits of inhabitants in Owerri, Southeastern Nigeria in the light of the ravaging COVID-19 pandemic.

One effective way to prevent the spread of the COVID-19 is through the proper use of facemask[8,32]. In light of this, the Federal Government of Nigeria in 2021, enacted a law on the compulsory use of facemasks in public places[33].

This study became imperative following the identification of proper facemask usage as an important measure that can help in the prevention and control of the disease[8], most especially in resource limited settings like Nigeria where the

vaccination may not be able to reach more than 50% of the population[17].

The rate of facemasks usage found in this study was very low (46.4%). This may be as a result of factors such as individual perceptions of the disease, feeling of inconvenience resulting from facemask usage, and other beliefs associated with the existence of COVID-19[17]. Other responsible factors may include demographic and cultural characteristics of the observed participants, low implementation of the law on the use of facemasks in public places, and the differences in the perceived prevalence of COVID-19 in the various places of data collection. Studies in countries of South Asia[34,35] found much more usage rate of facemasks during the COVID-19 pandemic. It has been observed that the cultural background of the people has the capacity to influence the frequency and the correctness of the use of the facemask. In Poland for instance, even medical experts discourage the use of facemask[36]. In a study of the facemask use during the SARS-Cov-2 in Poland, Ganczak et al, reported a consistent decrease in facemask use over time among the people[37]. This indicates the possibility of also up scaling facemask usage in the study area and the rest of Nigeria as in other parts of the world if appropriate sensitization and enforcements are put in place. Studies from the US[13], Spain[12] and China[11] also revealed 75.5%, 60% and 99% prevalence of facemask usage respectively. This comparatively higher facemask usage may be as a result of the mode of data collection where these cited studies got self-reported facemask use information over the internet, our data were obtained through actual observation of the phenomenon. In support of this argument, a study from Iran[14] on facemask usage among the people reported almost similar facemask usage prevalence (45.6%) as ours. It is, therefore, safe to say that people could have reported more facemask usage even if it is not so when given a chance to report, as were observed in the cited studies from China, Spain and the US[11,12,13].

The highest rate of facemasks usage/adherence was observed among the adolescents than people of other age categories. This is in contrast with previous studies, which found that adults used facemasks more than adolescents[9, 35]. Access to COVID-19 information especially through the social media is more common among the adolescents; this may have played an important role in influencing the facemasks usage among them[9].

The study also found that facemasks were used more in the urban areas than in the rural areas. This is similar to a report of a previous study where facemasks were also used more by people in the urban areas than in the rural areas[9]. This difference in facemask usage between the rural and the urban residents could be mostly due to the difference in the socioeconomic status of people in the urban and the rural areas. There is also better access to health information by the urban dwellers; access to information has been shown to influence health behavior and attitude[38].

Facemask usage was the lowest in the business/market premises. Although, this study was unable to capture the educational level of the observed candidates, it is usually the case for the traders to have relatively low educational attainment[39]. If that is the case, this may explain the apathy towards the use of facemasks as in other disease control protocols as observed among them. On the contrary, highly educated individuals have been shown to have a better disposition towards disease control measures often occasioned by them being better informed[40, 41].

Facemask usage was found to be higher in the mornings than during any other period of the day. This may be as a result of atmospheric conditions which are usually humane during this period. The lowest rate of facemask usage was observed

in the evenings, just as improper usage of facemasks was observed more in the afternoons. These observations may be attributed to atmospheric conditions which are usually hot and harsh in the afternoons, inducing the feeling of discomfort while wearing the facemask. Another study had observed that the feeling of hotness as well as difficulty in breathing discouraged wearing facemasks always and suggested that more convenient alternatives such as face shield should be should be recommended during the afternoon[9].

Facemask usage was significantly higher in males than in females in this study. This is in contrast with a study in Saudi Arabia and in south Asian countries where there was higher usage amongst females than males[34,35]. This contrast may be as a result of difference in cultural orientation particularly among females in the respective parts of the world.

The most commonly used facemask was the cloth facemask. This was also found in a similar study from other parts of Africa[42]. The use of cloth facemask is highly recommended by the US CDC because most people can afford it and the ease with which it can be managed when compared to the other types of facemasks[43, 44]. On the contrary, however, people in China[45]and Hong Kong[46] wore more medical facemasks. This difference in facemask types used is likely due to the differences in the economic capacity of the observed populations as well as previous experiences with flu like illnesses, and possibly also because the COVID-19 emanated from the later regions[8]. Majority of the observed individuals in Nigeria may not be able to afford medical facemasks that will usually require replacement after a short period, unlike the cloth facemask that only requires constant washing, which can also be used for a fairly long period of time.

A lower proportion of individuals who wore facemasks as observed in this study, wore them correctly. Some were observed wearing their facemasks 'inside-out' or 'upside-down', some on the chin or lower jaw. The implications of improper wearing of the facemask are far reaching as it can aid the transmission of the virus. On the contrary, people in developed parts of the world have been observed to be in the habit of wearing their facemasks correctly[45, 46], more than what was observed in this study. The difference again may be due to the consciousness imbibed as a result of previous experiences with flu like illnesses, as well as appropriate sensitization on the use of facemasks.

Among the different settings where observations were made, correct use of facemasks was observed more in the banks, not even in the health facilities. The banks are more enclosed and compact and therefore enforcement of use of facemasks and other protocols is easier compared to other settings which are more open, without enforcement of precautionary protocols. Significant relationship was found in the use of facemask and the location, settings, time, gender, and age groups, indicating that these factors are major determinants of facemask usage in the study population.

CONCLUSION

This study of the facemask usage in the southeastern Nigeria during the COVID-19 pandemic is novel in the study area and in Nigeria at large. This study reported large numbers of non-usage of facemask in public places by the people. Large numbers of improper use and abuse of facemask among the residents in the study area were also reported. This study will serve as a baseline for further study in the area of facemask usage during the COVID-19 pandemic even as Nigeria and the remaining parts of the world are gearing up for the fourth wave of the pandemic following the discovery of the Omicron variant of the COVID-19 virus.

LIMITATIONS

Because of the observational nature of the study, it was unable to analyze several key demographic characteristics such as age, educational level, occupation, and income. Furthermore, the study does not examine why people do not wear facemasks. The participants were divided into three age groups: children, adolescents, and adults. A non-differential miss-classification could occur in the age grouping.

RECOMMENDATIONS

At the level of facemask usage, there is no guarantee of protection of the public against COVID-19. It is, therefore, imperative that intensive sensitization program for the promotion of positive behavior towards facemask usage be implemented. Additionally, adequate education and enforcement of rules governing the usage of facemasks should be promoted.

Also, medical students should be engaged in training and health education of the general public on infectious pandemic preventive measures, as such, training capacity and knowledge of infection control should be incorporated into the training programs of the medical students so that they too can be useful in that regard in terms of global crisis like it has been witnessed in the current COVID-19 pandemic. The use of medical students to train and educate the general public was proven to be effective in Vietnam[47].

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