

Behavioural risk-factors associated with the use of Facemask during Covid-19 pandemic lockdown period in Nigeria: Online-based survey

Okondu Ogechukwu Emmanuel^{a,*}, Khadija Abubakar^b, Maitanmi Julius Olatade^c, Akingbade Oluwadamilare^d, Adesuyi Emmanuel O^e, Olugasa Babasola^f, Anyanwu Favour Chiamaka^g, Ekezie Modestina Amuche^h, Arulogun Oyedunni Sⁱ, Ifediora Uchenna Loveth^j, Okondu Chinedu Worlu^k

^a Faculty of Education, Department of Human Kinetics and Health Education, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria.

^b University of Sheffield, South Yorkshire, England, United Kingdom.

^c Department of Community/Public Health Nursing, Babcock University, Ilishan-Remo, Ogun State.

^d Institute of Nursing Research, Osogbo, Osun State, Nigeria

^e School of Nursing and Midwifery, Birmingham City University, West Midlands, United Kingdom.

^f Department of Veterinary Public Health and Preventive Medicine, University of Ibadan.

^g School of Health Technology, Department of Public health, Federal University of Technology Owerri (FUTO), Owerri Imo State.

^h Nottingham Trent University, Shakespeare Street Nottingham NG1 4FQ, United Kingdom

ⁱ Faculty of Public Health, Department of Health Promotion and Education, University of Ibadan, Nigeria

^j Faculty of Education, Department of Human Kinetics and Health Education, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria.

^k Faculty of Education, Department of Primary Education Studies, Ignatius University of Education, Rivers State, Nigeria.

Abstract

Background: The Coronavirus disease has rapidly become a public health challenge, with many countries adopting the usage of facemasks as one of the protective strategies against the virus. This study aimed to assess the behavioral risk factors associated with the use of facemasks during the Covid-19 pandemic lockdown period in Nigeria.

Methods: The study recruited 500 participants in an online-based survey through a cloud-based platform called Google Forms. The main scales; facemask usage and behavioral risk factors were measured on a 0-27 and 0-24 point rating scale respectively, while the subscales are utilization, prevention, and perceived threats were measured on a 0-16, 0-19, and 0-5 point rating scale.

Result: The usage of facemasks accounts for 32.8% (daily), 12.2% (weekly), 38.2% (monthly basis), and 16.8% use facemasks out of necessity. More than half (55.6%) use facemasks because of fear of punishment by the task force while challenges associated with the usage of facemasks include: difficulty breathing (47%) and suffocation (24%). A significant association was found between the use of facemasks and the prevention of COVID-19 ($b = 0.029$, 95% CI = 0.055 - 0.114, p -value 0.049, $r^2 = 11.1\%$).

Conclusion: The use of facemasks has become a norm and passed into law in Nigeria, however not a pleasant practice for most people

Recommendation: Therefore, there is a need for mass awareness and education to improve the use of facemasks in Nigeria.

Keywords: COVID-19, pandemic, facemask, Usage, behavioural risk factors, Nigeria, Submitted: 12th/08/2022 Accepted: 16th/10/2022

1. Introduction

The Coronavirus disease has rapidly become a huge public health challenge since the COVID-19 pandemic was declared a Public Health Emergency of International Concern (PHEIC) on January 30, 2020, (1) with many countries adopting various intervention policies to prevent infection and spread. The disease identified as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) – a respiratory pathogen, causes severe respiratory disease now generally referred to as COVID-19.

Originating from the Wuhan Province in China on December 30, 2019, (2) the COVID-19 pandemic has rapidly become a cause for concern as 120,915,219 cases and 2,674,078 deaths have been recorded as of March 18, 2021, (21). In a bid to curb the spread of the virus, countries affected have taken up stringent intervention practices intending to prevent infection and stop transmission where the infection is confirmed and mitigating the impact of the virus on a country. One of these interventions is the use of face masks by both the general public and healthcare workers even as a recent systematic review and meta-analysis revealed that the usage of facemasks can reduce the risk of respiratory virus infection by 80%, (3).

Initially, there was a debate arising from the release of the initial guidelines by the WHO on having only symptomatic persons, caregivers and those with close contact with sick persons wear face masks in public, (4, 5, 6, 7). However, the guideline was relaxed to include the use of face masks by all persons (7). Face masks serve as physical barriers between the mouth and nose of a wearer and possible contaminants and without treatment and vaccine for the virus, the reliance on face masks cannot be stressed enough, to mitigate the spread of the virus.

Before declaring a pandemic and global public health challenge, and the compulsory use of facemasks along with other policies adopted to reduce the spread of the virus, many Nigerians regarded

the virus as a faraway western feebleness which led to the exposure of Nigerians to the virus, (8) an occurrence that would have been prevented had Nigerians and the government adopted preventive measures that would have saved cost and also prevented exposure to the virus. However, through the presidential task force on COVID-19 in Nigeria, the government has since introduced many safety measures to reduce the spread of the virus among which are the lockdown of schools and non-essential services or activities, frequent hand washing, compulsory use of facemasks in public places and more, (9).

Issues arose with these measures, especially with wearing facemasks amongst citizens, as there were no adequate information, knowledge, and awareness regarding its use. However, the implementation of the outlined preventive measures is dependent on knowledge, compliance, and public response. This agrees with, (1) who opined that to topple the epidemiological curve of COVID-19 in Nigeria everyone has a responsibility. They discovered in their study that respondents showed good knowledge of COVID-19 although with some misconceptions hence the need for more awareness of the myths surrounding COVID-19 as well as proper precaution measures. A recent study showed that individuals displayed adequate knowledge and use of facemasks, albeit homemade ones, (10). Another study, however, showed no indication of adherence to the practice of facemask use, indicating a need to educate and raise awareness amongst the Nigerian populace, (11).

Some factors may contribute to disregarding the use of face masks. For instance, the virus was not spared the unscientific and traditional treatment method Nigerians adopt in tackling any ailment. Additionally, was the notion that the coronavirus is an affliction of the white man only, (10). Social stigma may also play a part in non-adherence to wearing a facemask in addition to the belief that the virus poses no serious health risks and that wearing a facemask has no associated benefit. The consequences of not properly using the facemask can lead to the contraction of the virus and possible death. A recent study has shown that proper compliance to rules of adhering

*Corresponding author.

Email address: emmaokondu@gmail.com (Okondu Ogechukwu Emmanuel)

to facemask policy has shown a positive correlation to adhering to other safety measures, (2).

While various studies have examined the level of compliance with face mask usage in Nigeria; however, the behavioral risk factors associated with the use of facemasks during the lockdown are understudied. This prompted the researchers to conduct this study in a bid to address this gap.

2. Methods

Study design and population

The study recruited 500 respondents in the online-based survey measuring the behavioural risk factors associated with the use of facemasks during the COVID-19 pandemic during the lockdown period. The study was conducted in Awka South, Anambra State Nigeria between May 2020 and July 2020. Awka is the capital of Anambra State and a metropolitan; inhabited by the Igbo ethnic group in the south-eastern region of Nigeria, they are known for both small, and large-scale business enterprising, and civil servants. The sample size was estimated using G power sample size calculated according to Faul and colleagues, (5, 6). **Exact** - Linear multiple regression: Random model

Options: Exact distribution

Analysis: A priori: Compute required sample size

Input: Tail(s) = One

H1 ρ^2 = 0.037

H0 ρ^2 = 0

α err prob = 0.05

Power (1- β err prob) = 0.95

Number of predictors = 3

Output: Lower critical R^2 = 0.0171219

Upper critical R^2 = 0.0171219

Total sample size = 456

Actual power = 0.9502260

At 10% attrition, $456 + 46 = 502$

Only 500 respondents properly filled the questionnaire

Study variables and Study instrumentation

The main scale considered were the use of facemasks and behavioural risk factors while the

subscales scale considered were; prevention skills, utilization, and perceived threats. The socio-demographic characteristics considered were; Age, gender, marital status, employment status, and employer. The rating scale for the main and sub-scales includes; facemask usage and behavioral risk factors measured on a 0-27 and 0-24 point scale respectively (main scales), while Utilization, prevention, and perceived threats are measured on a 0-16, 0-19 and 0-5 point rating scale respectively (sub-scales) to elicit prevalence performance score as shown in Table 5

Data collection and Management

The study was a questionnaire based using the online cloud base data collection method, the questionnaire included the consent form which enables each respondent to continue filling the form or lock each entry depending on which options were chosen. The data generated were transformed into codes and analyzed using the statistical package for social science (SPSS) IBM version 23. Counts and percentages were computed to describe the baseline data, descriptive composite scores were computed to determine the prevalence and simple linear regression analysis was computed to determine the factors associated with the use of facemasks among respondents at a significant level of 0.05.

3. Results:

The mean age of respondents was 26.96 ± 12.2 , the female respondents account for more than half (69.2%) of the study population compared to their male counterparts (30.8%). On employment status, the gainfully employed status accounted for (56.0%), followed by students (24%), and the unemployed and self-employed 5.6% and 13.6% respectively. Of the working class status, 26.2% work with the government, 32.4% work with private organizations, and 7.2% were self-employed while 34.2% were either unemployed or choose not to answer. On marital status, 67.4% of the respondents were single, while 32.2% had a married status.

Table 1: Demographic Characteristics of respondents in this study; N=500

| Socio-demographic variables for consideration | Respondents in this study; N=500 | |
|---|----------------------------------|----------------|
| | Freq (n) | Percentage (%) |
| 1. Age (in years) 26.96±12.20 | | |
| 2. Gender | | |
| Female | 346 | 69.2 |
| Male | 154 | 30.8 |
| 3. Employment Status | | |
| Student | 124 | 24.8 |
| Employed | 280 | 56.0 |
| Unemployed | 28 | 5.60 |
| Self-employed | 68 | 13.6 |
| 4. Employer | | |
| Government | 131 | 26.2 |
| Private organization | 162 | 32.2 |
| Students | 36 | 7.2 |
| Unemployed | 141 | 34.2 |
| 5. Marital Status | | |
| Single | 337 | 67.4 |
| Married | 161 | 32.2 |
| Divorced | 0 | 0.00 |
| Separated | 0 | 0.00 |

Most (93%) of the respondents have a facemask, about 4% claim not to have one, and 3% are indifferent on the matter. On the type of facemask, they have, about 33% claim they have N95, while surgical masks followed by 27% and Ankara material (25.2%), Satin material (8%), and face-shield (2.4%) respondents. The number of facemasks owned by respondents revealed that 23% have one, 27% of the respondents have just two, 15.2% have about three while 28.2% have more than three and about 6% do not have a facemask. Usage of facemasks accounts for 32.8% (daily), 12.2% (weekly), 38.2% (monthly basis), and 16.8% use facemasks out of necessity.

On the level of usage of the facemask to prevent the spread of covid19; 18.8% moderately use facemask with a majority 68.4% properly using a facemask, also the prevalence of facemask usage account for 62.22% among the study population. In contrast, the utilization of facemask for the prevention of covid-19 indicates that 3.6% of the respondent's utilization were poor, 24.6% had moderate utilization, and the majority, 62.4% had good utilization of facemask as a preventive measure for covid-19 spread, as computed the prevalence of facemask account for 58.62% and Utilization of facemask as a preventive measure to curb the spread of covid-19 is significantly ($b= 0.250$, 95% CI =0.179 - 0.322, p-value 0.019) associated with usage of facemask.

On the account of disposing of used facemasks,

more than half (54.6%) do not dispose of them but rather reuse them, 19.4% use the trash bin, 2.2% burn their used facemask, 15.6% indicated they flush their used facemask down the toilet, and about 9% are indifferent on what they do after usage. The use of water and soap for facemask laundry accounts for the majority (80.4%), with only running water (11.8%), with bleach (7%), and only sundry accounts for 0.8%. Most (61.2%) of the respondents think a facemask should be reused while about 38.8% do not think so. Sharing a facemask with friends and or with family accounts for 22.2% while 79.8% of the respondents do not think a facemask should be shared. As computed the level of risk involved in not using a facemask among respondents is significantly associated with the use of a facemask ($b= 0.307$, 95% CI =0.237 - 0.384, p-value 0.001).

Table 2: Facemask usage characteristics among Respondents on Covid-19 pandemic Lockdown period; N=500

| Statements for Consideration | Respondents in this study, N=500 | |
|--|----------------------------------|----------------|
| | Frequency (f) | Percentage (%) |
| Do you use a facemask? | | |
| Yes | 465 | 93.0 |
| No | 20 | 04.0 |
| Indifferent | 15 | 03.0 |
| If yes, what kind of facemask do you use? | | |
| N95 | 166 | 33.2 |
| Surgical Mask | 137 | 27.4 |
| Satin Material | 40 | 08.0 |
| Ankara | 126 | 25.2 |
| Face Shield | 12 | 02.4 |
| Indifferent | 19 | 03.8 |
| How many face masks do you have? | | |
| None | 30 | 06.0 |
| 1 | 115 | 23.0 |
| 2 | 138 | 27.6 |
| 3 | 76 | 15.2 |
| >3 | 141 | 28.2 |
| How often do you use a facemask? | | |
| Daily | 164 | 32.8 |
| Weekly | 61 | 12.2 |
| Monthly | 191 | 38.2 |
| Necessity | 84 | 16.8 |
| Level of Usage | | |
| Poor | 0 | 0.00 |
| Moderate | 94 | 18.8 |
| Good | 342 | 68.4 |
| Excellent | 64 | 12.8 |
| Utilization of Facemask as a Preventive method | | |
| Poor | 18 | 3.60 |
| Moderate | 123 | 24.6 |
| Good | 312 | 62.4 |
| Excellent | 47 | 9.40 |

Prevention of Covid-19 through the use of a facemask accounts for 32.4%, about 47.4% think it may prevent while about 20.2% do not think the use of a facemask prevents covid-19. Similarly, 56.4% of those that don't believe facemask can prevent COVID-19 thinks there is no Covid-19 in Nigeria, 8.2% thinks facemask can do little or nothing with COVID-19 prevention, 27.2% believes COVID-19 is not airborne and about 9%

thinks it causes inconveniences the reasons they do not use a facemask. Subsequently, among those that said yes they use facemasks, 33.2% of the respondents use them when at home, 2.2% use them when driving, 37% use facemasks when in crowded places, 35 use them when in the market while 24.6% use facemask only when they about anywhere. Prevention of covid-19 is significantly associated with the use of facemasks among respondents ($b= 0.029$, 95% CI =0.055 - 0.114, p value 0.049, $r^2=11.1\%$).

The usage of a facemask in Nigeria particularly to cover the mouth, nose, and jaw accounts for 14%, hanging the facemask by the jaw accounts for more than half (53%) of the respondents, covering only the mouth accounts for 14.2% while other practices account for 18.8%. Consequently, the choice of their practice includes; avoiding arrest by covid-19 taskforce accounts for 15.4%, more than half (55.6%) are afraid of being flogged by the task force, 3.6% are running from being fined, while 25.4% use facemasks because they wish to protect themselves from contracting COVID-19.

Removing the facemask by straps behind the ear or head accounts for more than half (55.6%) while other practice like removing it from the layers covering the face accounts for 44.4% of the entire study population, of the number that removes the facemask using the straps behind the ear or head about 43.4% sanitize their hand before removing the straps while 56.6% do not sanitize. The argument that a fabric facemask is more protective than a medical facemask accounts for 36.8%, about 36% do not think so while 27.4% are neither on both sides of the argument.

Within the last month, about 19.6% have had rashes due to frequent use of facemask while 80.4% have not experienced any of such, for most (81.6%) of the respondents their facemask do not have loose ends while 18.4% say they have loose ends, only 7.6% of the respondents agreed they combine both a facemask and face-shield while 92.4% only makes use of any kind.

Difficulty breathing associated with the use of a facemask accounts for 47% while more than half (53%) have not had any issues with breathing.

Similarly, on the account of suffocation, 24.6% have experienced it while on a facemask, the majority (67.6%) have not experienced such while 7.8% of the respondents think they have had it somehow. More so, about one-half (49%) of the population does not think the legislation to use a facemask was a welcome idea and done any good to the people while 21.2% think it has done much good but another 29.8% is neither here nor there.

Table 3: Perceived Threats of Facemask use during Covid-19 Pandemic Lockdown period among Study Population

| Statements for Consideration | Respondents in this study, N=500 | |
|---|----------------------------------|----------------|
| | Frequency (f) | Percentage (%) |
| In the last one month have you experienced any form of face rashes and or scares? | 402 | 80.4 |
| Yes | 59 | 11.8 |
| No | 39 | 7.80 |
| Maybe | | |
| Is your facemask loose at both ends? | 408 | 81.6 |
| Yes | 70 | 14.0 |
| No | 22 | 4.40 |
| Maybe | | |
| Do you use both Facemask and Face-shield at the same time? | 462 | 92.4 |
| Yes | 38 | 7.60 |
| No | | |
| Do you experience any difficulty breathing while using facemask? | 265 | 53.0 |
| Yes | 235 | 47.0 |
| No | | |
| In the last one month have you experienced any form of suffocation? | 123 | 24.6 |
| Yes | 39 | 7.80 |
| No | 245 | 49.0 |
| Maybe | 106 | 21.2 |
| Has the use of facemask done any good to us? | 149 | 29.8 |
| Yes | 400 | 80.0 |
| No | 100 | 20.0 |
| Maybe | | |
| Perceived threats from Use of Facemask | | |
| Low | | |
| Substantial | | |

On the account of the level of risk associated with Facemask usage; 10.8% accounts for mild risk, moderate risk of facemasks accounts for 59.6% while the prevalence of respondents' risk behaviour towards the use of facemasks is 69.79%. Similarly, threats to life the use of facemask pose to users accounts for 29.2%. The level of prevention among respondents indicates that 23.4% of the respondents have moderate prevention skills, while the majority 65.4% demonstrated some high level of preventive skills, also the prevalence of facemask covid-19 prevention accounts for 65.15%, more so, the behavioural risk factors (16.75 ± 3.30) associated with the prevention of covid-19 accounts for about 70%.

Table 4 Descriptive summaries of composite scores among study participants

| Variables | Point Scale Measures Reference | Respondents in this study; N=500 | | Prevalence Performance (%) |
|--------------------------|--------------------------------------|-------------------------------------|------|----------------------------------|
| | | Mean | SD | |
| Age | | 26.96 | 12.2 | |
| Facemask Usage | 27 | 17.88 | 3.39 | 66.22 |
| Utilization | 16 | 9.38 | 2.32 | 58.62 |
| Prevention of Covid-19 | 19 | 12.38 | 2.92 | 65.15 |
| Perceived threats | 05 | 1.46 | 1.28 | 29.20 |
| Behavioural risk factors | 24 | 16.75 | 3.30 | 69.79 |

The study results indicate that the Utilization of facemasks for the prevention of Covid-19 was barely above average at 58.6% (9.38 ± 2.32). Among the reasons for non-usage of facemask is perceived threat to life; the study data indicates that 20.0% (high risk to life) of respondents considers using the use of a facemask a threat to their life compared to 80.0% (low threats to life) and prevalence of use of facemask as a potential threat to life accounts for 29.2% (1.46 ± 1.28). Perceived threats to life are not associated with the usage of facemasks among respondents ($b = 0.063$, 95% CI = 0.185 - 0.060, p -value 0.318).

Table 5: Simple Linear Regression analysis on factors (independent variables) associated with Facemask usage during Covid-19 Lock down period across Nigeria States.

| Independent variable | Respondents in this study; N=500 | | | |
|----------------------|----------------------------------|----------------|--------------|----------------|
| | b (95% CI β) | t (Statistics) | P value | r ² |
| Age | 0.024 (0.003, 0.005) | 0.503 | 0.616 | 0.001 |
| Utilization | 0.250 (0.179, 0.322) | 6.887 | 0.019 | 0.087 |
| Prevention | 0.029 (0.055, 0.114) | 0.682 | 0.049 | 0.001 |
| Level of risk | 0.307 (0.231, 0.384) | 7.902 | 0.001 | 0.111 |
| Perceived threats | 0.063 (0.135, 0.060) | 0.999 | 0.318 | 0.002 |
| Gender | 0.270 (0.166, 0.374) | 5.103 | 0.001 | 0.050 |
| Employment | 0.035 (0.018, 0.088) | 1.302 | 0.193 | 0.003 |
| Employer | 0.078 (0.121, 0.036) | 3.620 | 0.001 | 0.026 |
| Marital Status | 0.139 (0.040, 0.228) | 2.800 | 0.005 | 0.016 |

4. Discussion:

This survey reveals that although the use of facemasks has become a norm in Nigeria with 95% of the respondents in this survey having a facemask, however, many still find its usage challenging as the prevalence of face mask usage in this study was found to be 62.22%. Only about

one-third of the respondents in this survey reported daily usage with as many as 38.2% reporting monthly usage and 16.8% only using it out of necessity. According to a study (14), about 20% of the study respondents do not find the usage of face masks comfortable when going out. This is worrisome as poor usage of facemasks reduces the level of protection against the virus even as this study found a significant association between the usage of face masks and the prevention of COVID-19.

Similarly, the study clearly showed that there are many wrong perceptions and myths surrounding the issue of COVID-19 as many of the respondents do not believe that COVID-19 is airborne and can be prevented by the use of a facemask. In another study, it was discovered that the respondents had the notion that the coronavirus is an affliction of the white man only (15). Similarly, A study found several COVID-19 misconceptions among Nigerians which include: children and young adults do not need to take precautions against COVID-19 and that not everybody is required to wear a face mask when going out (14). These misconceptions highlight the need for more advocacy efforts to reach more people about the usage of facemasks even as this study found that over one-third of the participants use face masks monthly.

This study also found that fabric masks are more common in usage as ‘Ankara’ (a cloth fabric) face mask usage was 25.2% and Satin (another cloth fabric) usage was 8%. This is in tandem with the findings in a study (1) that reported 46.2% usage of fabric masks while another study, (17) reported 72.7% fabric mask usage. A study reported that fabric masks are currently in wide usage with a filtration frequency of 35% in single-layer fabric masks and 45% in layered fabric masks which can provide the desired protection during the pandemic especially in communities without access to N95 masks, although they observed that fabric masks were more difficult to breathe through (18). However, 36.8% of the respondents in this survey opined that fabric facemasks are more protective than medical facemasks highlighting the need for more awareness

to clarify this and other misconceptions common among the populace.

While the usage of face masks has become ubiquitous globally; however, many concerns about the appropriateness of the users have been documented. In this study, more than half of the respondents do not dispose of but rather reuse their face masks. This was similar to the report from these studies (19, 20, 21) which reported the reuse of face masks among Nigerians. Similarly, 71.7% reuse of facemasks was also reported in another study (17). Furthermore, improper usage was reported in more than half of this study as they noted they hang the mask around their jaw. This attitude calls for more interventions that will culminate in attitudinal change even as more than half in this study claimed they only hang the mask around their jaw due to the fear of punishment from the task force for non-usage. Similarly, more than half in this study reported not sanitizing their hands before removing facemasks. These further point to gaps in knowledge and attitude that needs to be addressed via appropriate interventions, through a call for more education and awareness (22) who observed that poor adherence to facemask usage can be addressed via educational interventions.

An association was found between gender and facemask usage in this study, a study found that being a woman increased the likelihood of using masks. (17). similarly, a study found that gender as a factor is associated with compliance with COVID-19 prevention strategies. (14) Furthermore, some challenges with face mask usage were brought to the fore in this study as 19.6% complained they had rashes with facemask usage, 47% had difficulty in breathing and 24.6% experienced suffocation. While these challenges are worth considering, however, this calls for more proper health education from health workers on strategies to mitigate negative facemask usage experiences.

5. Limitation

The study may have been subjected to social desirability bias wherein the respondents may

have responded in a manner suitable or favorable to others and strictly based on self-report. Also, this opinion is strict with those having access to the internet as this study was conducted online. Hence, these limitations should be considered when interpreting our study findings.

6. Conclusion

The findings of this study have revealed a discrepancy in the knowledge, attitude, and practice of face covering (facemask or face shield) in the prevention of COVID-19 in Nigeria. This has been consistent with the findings from other studies both in Nigeria and other countries especially in Africa. Factors such as lack of adequate knowledge, gender, adverse reaction on the skin as well as respiration have been implicated in the lack of use, improper use, and inappropriate awareness programs on the proper use and disposal of facemasks for the Nigerian populace.

7. Recommendations:

1. There is a need for mass awareness and education to improve the use of facemasks in Nigeria, and as well put in place measures that will favour their use
2. Conscious effort is required on the part of the Covid-19 Taskforce team in the enforcement and regulation of the use and disposal of facemask
3. Government agencies should encourage public organizations like banks, supermarkets and other cooperate organizations to provide facemasks to clients as a way of motivating facemask usage, while
4. The facemask should be distributed freely in the community or sold at a subsidized rate
5. The covid-19 task force team should as a matter of urgency consider routine monitoring and evaluation among industries producing facemasks to improve the safety and comfort of the people using a facemask.
6. There should be sanctions for non-compliance with the use of facemasks in public places
7. Further research is also required to identify other intrinsic factors that may influence the use

of face coverings in Nigeria in the prevention of COVID-19.

Contributorship Statement

OOE was responsible for instrumentation, methodology, data analysis, and management, KA was responsible for writing an introduction, MJO, AO and EOA were responsible for discussion, OB, NCW, OOE, and AOO were responsible for editorial, AFC, EMA, OOE, and IUL were responsible for instrumentation and data collection.

8. Competing Interest

No competing interest

9. Acknowledgement:

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10. Authors Biography

Okondu Ogechukwu Emmanuel

Faculty of Education, Department of Human Kinetics and Health Education, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria

A commonwealth scholar, researcher, and public health expert with over 11 years of experience who focuses on research implementation, avoidable communicable and non-communicable diseases, and effective sustainable community, and health development. A specialist with the capacity to forge close bonds with any target demographic and who consistently works to engage students by fostering environments that promote effective learning. The range of work includes enhancing health systems, capacity building, survey designs and instruments, data management, and classroom management and ethics.

Khadija Abubakar

University of Sheffield, South Yorkshire, England, United Kingdom Public health professional in the United Kingdom

Maitanmi Julius Olatade

Department of Community/Public Health Nursing, Babcock University, Ilishan-Remo, Ogun State

A nursing professional, Lecturer, and Ph.D. candidate in the department of public health nursing at Babcock University

Akingbade Oluwadamilare

Institute of Nursing Research, Osogbo, Osun State, Nigeria

A dynamic community health specialist is passionate about impacting families and communities through research. He is the Chief Executive Officer of the Institute of Nursing Research, Osogbo, Osun State, Nigeria. He doubles as a Ph.D. Candidate at the Nethersole School of Nursing, The Chinese University of Hong Kong. He is presently developing a mobile application to provide psychoeducational support for Nigerian women diagnosed with breast cancer receiving chemotherapy

Adesuyi Emmanuel O,

School of Nursing and Midwifery, Birmingham City University, West Midlands, United Kingdom

A Nigerian registered nurse and midwife are appointed as the Chief Operating Officer of the Institute of Nursing Research, Nigeria. He is currently a UK Registered nurse, doctoral researcher, and assistant lecturer at the Birmingham City University, United Kingdom. He has over 10 years of experience working as a nurse at several levels of the health care system both in Nigeria and the UK. He has published several scholarly works in local and international journals. His research focuses on digitalisation in nursing education, public health, public health education, health promotion, cancer metastasis, genetics, and genomics.

Olugasa Babasola

Department of Veterinary Public Health and Preventive Medicine, University of Ibadan

A reader/associate professor (Epidemiology and Veterinary Public Health) at the department of Veterinary Public Health and Preventive Medicine, University of Ibadan

Anyanwu Favour Chiamaka

School of Health Technology, Department of Public health, Federal University of Technology Owerri (FUTO), Owerri Imo State

A public health technologist finalist at Federal

University of Technology, Owerri, Imo State, and girls advocate with girl-up

Ekezie Modestina Amuche

Nottingham Trent University, Shakespeare Street Nottingham NG1 4FQ, United Kingdom

Health education professional and entrepreneur

Arulogun Oyedunni S

Faculty of Public Health, Department of Health Promotion and Education, University of Ibadan, Nigeria

Professor of health promotion and education at University of Ibadan College of medicine Ibadan, Oyo, Nigeria

Ifediora Uchenna Loveth

Faculty of Education, Department of Human Kinetics and Health Education, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria

Graduate teaching assistant and MPH candidate at Nnamdi Azikiwe University, Awka, Anambra State.

Okondu Chinedu Worlu

Faculty of Education, Department of Primary Education Studies, Ignatius University of Education, Rivers State, Nigeria

A primary education and early childhood studies student at Ajuru Ignatius University of Education, Rivers State, Nigeria.

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Author biography

Okondu Ogechukwu Emmanuel Faculty of Education, Department of Human Kinetics and Health Education, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria

A commonwealth scholar, researcher, and public health expert with over 11 years of experience who focuses on research implementation, avoidable communicable and non-communicable diseases, and effective sustainable community, and health development. A specialist with the capacity to forge close bonds with any target demographic and who consistently works to engage students by fostering environments that promote effective learning. The range of work includes enhancing health systems, capacity building, survey designs and instruments, data management, and classroom management and ethics.

Khadija Abubakar A public health professional in the United Kingdom
University of Sheffield, South Yorkshire, England, United Kingdom

Maitanmi Julius Olatade Department of Community/Public Health Nursing, Babcock University, Ilishan-Remo, Ogun State

November 17, 2022

A nursing professional, Lecturer, and Ph.D. candidate in the department of public health nursing at Babcock University

Akingbade Oluwadamilare Institute of Nursing Research, Osogbo, Osun State, Nigeria

A dynamic community health specialist is passionate about impacting families and communities through research. He is the Chief Executive Officer of the Institute of Nursing Research, Osogbo, Osun State, Nigeria. He doubles as a Ph.D. Candidate at the Nethersole School of Nursing, The Chinese University of Hong Kong. He is presently developing a mobile application to provide psychoeducational support for Nigerian women diagnosed with breast cancer receiving chemotherapy

Adesuyi Emmanuel O School of Nursing and Midwifery, Birmingham City University, West Midlands, United Kingdom

A Nigerian registered nurse and midwife are appointed as the Chief Operating Officer of the Institute of Nursing Research, Nigeria. He is currently a UK Registered nurse, doctoral researcher, and assistant lecturer at the Birmingham City University, United Kingdom. He has over 10 years of experience working as a nurse at several levels of the health care system both in Nigeria and the UK. He has published several scholarly works in local and international journals. His research focuses on digitalisation in nursing education, public health, public health education, health promotion, cancer metastasis, genetics, and genomics.

Olugasa Babasola Department of Veterinary Public Health and Preventive Medicine, University of Ibadan

A reader/associate professor (Epidemiology and Veterinary Public Health) at the department of Veterinary Public Health and Preventive Medicine, University of Ibadan

Anyanwu Favour Chiamaka School of Health Technology, Department of Public health, Federal University of Technology Owerri (FUTO), Owerri Imo State

A public health technologist finalist at Federal University of Technology, Owerri, Imo State, and girls advocate with girl-up

Ekezie Modestina Amuche Nottingham Trent University, Shakespeare Street Nottingham NG1 4FQ, United Kingdom

A health education professional and entrepreneur

Arulogun Oyedunni S Faculty of Public Health, Department of Health Promotion and Education, University of Ibadan, Nigeria

Professor of health promotion and education at University of Ibadan College of medicine Ibadan, Oyo, Nigeria

Ifediora Uchenna Loveth Faculty of Education, Department of Human Kinetics and Health Education, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria

Graduate teaching assistant and MPH candidate at Nnamdi Azikiwe University, Awka, Anambra State.

Okondu Chinedu Worlu Faculty of Education, Department of Primary Education Studies, Ignatius University of Education, Rivers State, Nigeria

A primary education and early childhood studies student at Ajuru Ignatius University of Education, Rivers State, Nigeria