Compliance with WHO Recommended Preventive Measures against COVID-19 among a Nigerian Population Attending a Teaching Hospital

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Authors’ contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Background: The fright and devastation that accompanied COVID-19 pandemic these past two years cannot be totally quantified. More so, the cycle of fear, panic, uncertainty and attempts at curtailment repeats itself every time the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) mutates and produces a new variant. The World Health Organization recommended personal protective measures are very important in slowing down the spread of infection. This study assessed the compliance of a Nigerian population with protective measures recommended by WHO in curbing the spread of COVID-19 infection.

Materials and Methods: A cross-sectional survey among patients attending medical outpatient in a Teaching Hospital. Interviewer administered questionnaire was used to collect data on participants demographics and compliance with WHO recommended preventive measures towards prevention of COVID-19 infection. Data analysis was carried out with Statistical Package for Social Science (SPSS) version 25(IBM Corp., Armonk, USA). The results were presented as frequency tables and

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cross-tabulations. Chi-square test was carried out with consideration for statistical significance at P<0.05.

**Results:** One hundred and ninety-six consecutive participants who gave consent were recruited for the study. There was a male predominance. Participants’ age ranged between 18 and 84 years with mean age of 34.92±14.10 years. Median age was 30 years. Half of participants had university education and about one tenth are professionals. About two-fifth earned less than 100 dollars monthly. Though about three-fifth of participants have heard of WHO recommended hand washing techniques for COVID-19 prevention, only two-fifth practice it. One third of participants regularly use face mask in the public and 85.2% do not practice physical distancing. Less than 10 % do not use soap and water or sanitizer to clean their hands. The participants’ attitudinal change to handwashing as a preventive measure for COVID-19 prevention was good. Participants’ most practiced personal preventive measures against COVID-19 were regular washing of hands and boosting immunity with vitamins. The association between participants’ demographics and WHO recommendation for hand washing in the prevention of COVID-19 showed a significant based on sex (p= 0.04). Females paid attention to washing of hands than males. The association between participants’ demographics and use of face masks in the prevention of COVID-19 showed that education was significant in determining use (P=0.04)

**Conclusion:** Awareness of personal preventive measures to COVID-19 washing of hands was increased among participants but there is the need to emphasize the wearing of face masks and physical distancing.

**Keywords:** Compliance; COVID-19, demographics; protective measures.

1. **INTRODUCTION**

Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) discovered in Wuhan; China in December 2019 has undergone several mutations. The recent discovery of omicron variant threw the world into another cycle of uncertainties and fears especially because of information that was scanty about it [1,2].

Globally, as of 26 January, 2022, 356,955,803 confirmed cases of COVID-19, including 5,610,291 deaths have been reported to the World Health Organization (WHO) [3]. In addition, a total of 9,679,721,754 vaccine doses have been administered [4]. In Africa as of January 25, 2022, there are 10,639,436 confirmed cases, 237,524 deaths and 94,293,113 vaccinations. In Nigeria, there were 252,750 confirmed cases and 3134 deaths as of January 27, 2022 [5]. Hence, there is the need to implement personal protective measures by the public in order to mitigate the spread of infection.

The World Health Organization still advocates preventive measures such as physical or social distancing, quarantining, ventilation of indoor spaces, covering mouths while coughing and sneezing, hand washing, and keeping unwashed hands away from the face. Also, the use of face masks or coverings has been recommended in public settings to minimize the risk of transmissions [6]. Social and physical distancing measures help slow the spread of disease by stopping the chain of transmission and preventing the appearance of new ones. These measures secure physical distance between people (of at least one meter), and reduce contact with contaminated surfaces, while encouraging and sustaining virtual social connection within families and communities [6].

Outbreaks have been reported in places where people gather such as crowded indoor settings and places of worship, fitness classes, restaurants and during choir practice [7-10]. The risk of getting COVID-19 is higher in crowded and inadequately ventilated environment where infected persons spend long period of time together in close proximity with non-infected persons. Thus, WHO recommended avoiding the 3Cs: closed, crowded and close contact. Physical distancing of at least one meter was advised and to increase the amount of natural ventilation by opening the windows and wearing of face masks if crowded and indoor settings cannot be avoided [6].

Another recommended preventive measure is keeping good hygiene. This includes ensuring that one cleans the hands regularly and thoroughly using either an alcohol-based hand rub or soap and water, thus eliminating germs that may be on the hands, including viruses [6]. Secondly, to cover the mouth and nose with bent
elbow or to cough and sneeze into a tissue and to dispose of used tissue immediately into a closed bin and wash hands. Finally, to clean and disinfect surfaces frequently used especially those which are regularly touched such as door handles, faucets and phone screens [6].

The use of face mask to cover the nose, mouth and shin was hands should be cleaned before wearing face masks, after taking it off, and after touching it at any time [6].

The effectiveness of WHO advocated measures in curbing the spread of COVID-19 depends on the people's levels of adherence to them [11-13]. Nigerians are highly superstitious and religious people who have their own ways of handling issues [11]. For example, the stay-at-home measures and restrictions (i.e., compulsory lockdown) showed lower effectiveness in reducing mobility when implemented in March 30, 2020 [14,15].

This study assessed the compliance to three of the five protective measures recommended by WHO by a group of Nigerians attending a teaching hospital in south-south, Nigeria.

2. METHODOLOGY

The cross-sectional survey was conducted among patients attending Family Medicine outpatient clinic in University of Port Harcourt Teaching Hospital in Rivers State, South-South, Nigeria. The study was done between November and December, 2021.

Interviewer-administered questionnaire was used to collect data on participants demographics and compliance with WHO recommended personal preventive measures for prevention of spread of COVID-19 infection. Participants’ hand hygiene was assessed using WHO recommendations with options such as soap and water for 40 seconds, soap and water < 40 seconds, soap & sanitizer, sanitizer 5 seconds, sanitizer 20 seconds. Face mask use was assessed with options like ‘yes always’ and ‘yes sometimes’ taken as compliance and ‘no, it can’t reduce spread of COVID-19’ as non-compliance.

Two hundred and ten participants who gave consent were recruited for the study using simple randomization. Response rate was 93.8%.

Inclusion criteria were participants aged 18 years who consented to the study. Exclusion criteria were participants who did not give consent.

Data analysis was done with Analysis was carried out with Statistical Package for Social Science (SPSS) version 25(IBM Corp., Armonk, USA). The results were presented as frequency tables and cross-tabulations. Chi-square test was carried out with consideration for statistical significance at P < 0.05.

3. RESULTS

Table 1 shows participants’ characteristics. One hundred and ninety-six participants with age ranged between 18 and 84 years with mean age of 34.92±14.10 years. Half of participants had at least university education with one tenth as professionals and two-fifth earned less than what is equivalent to 100 dollars monthly.

Though about three-fifth of participants have heard of WHO recommended hand washing for COVID-19 prevention., only two-fifth practice it. One third of participants regularly use face mask in the public and 85.2% still shake hands. Less than 10 % do not use soap and water or sanitizer to clean their hands Table 2.

Majority of participant's attitudinal change to handwashing as a preventive measure for COVID-19 prevention was good Table 2.

Most participants’ personal preventive measures against COVID-19 were regular washing of hands and boosting immunity with vitamins Table 3.

The association between participants’ demographics and WHO recommendation for hand washing in the prevention of COVID-19 showed a significant based on sex (p==0.04) Table 4.

The association between participants’ demographics and use of face masks in the prevention of COVID-19 showed that education was significant in determining use (P=0.04) Table 5.
Table 1. Participants' characteristics

| Variables                  | Frequency | Percentage |
|----------------------------|-----------|------------|
| **Sex**                    |           |            |
| Female                     | 79        | 40.3       |
| Male                       | 117       | 59.7       |
| **Age group (years)**      |           |            |
| 10-20                      | 18        | 9.2        |
| 21-30                      | 81        | 41.3       |
| 31-40                      | 49        | 25.0       |
| 41-50                      | 22        | 11.2       |
| 51-60                      | 8         | 4.1        |
| 61-70                      | 14        | 7.1        |
| >70                        | 4         | 2.0        |
| **Mean age ± SD = 34.92±14.10 years** |           |            |
| **Tribe**                  |           |            |
| Hausa                      | 8         | 4.1        |
| Igbo                       | 76        | 38.8       |
| Yoruba                     | 10        | 5.1        |
| South-South                | 102       | 52.0       |
| **Marital status**         |           |            |
| Single                     | 101       | 51.5       |
| Married                    | 88        | 44.9       |
| Divorced/Separated         | 7         | 3.6        |
| **Education**              |           |            |
| Secondary and below        | 46        | 23.5       |
| Diploma                    | 52        | 26.5       |
| Bachelor                   | 85        | 43.4       |
| Master/PhD                 | 13        | 6.6        |
| **Profession**             |           |            |
| Students                   | 52        | 26.5       |
| Self-employed              | 84        | 42.8       |
| Professionals              | 18        | 9.2        |
| Civil servants             | 26        | 13.3       |
| Retiree                    | 16        | 8.2        |
| Variables                | Frequency | Percentage |
|-------------------------|-----------|------------|
| **Monthly income**      |           |            |
| <50,000 naira           | 88        | 44.9       |
| 51,000-100,000 naira    | 55        | 28.1       |
| 101,000-200,000 naira   | 34        | 17.3       |
| 201,000-400,000 naira   | 15        | 7.7        |
| >400,000 naira          | 4         | 2.0        |
| **Total**               | 196       | 100.0      |

Table 2. Participants’ use of personal protective measures against COVID-19 as recommended by WHO

| Variables                                                   | Frequency | Percentage |
|-------------------------------------------------------------|-----------|------------|
| Have you heard of WHO recommendation for hand washing?      |           |            |
| Yes                                                         | 113       | 57.7       |
| No                                                          | 83        | 42.3       |
| Do you follow WHO recommendation for hand washing          |           |            |
| Yes always                                                  | 75        | 38.3       |
| Sometimes                                                   | 54        | 27.5       |
| Rarely                                                      | 64        | 32.7       |
| Never                                                       | 3         | 1.5        |
| Regular public use of face mask                             |           |            |
| Yes always                                                  | 69        | 35.2       |
| Yes sometimes                                               | 102       | 52.0       |
| No, it can’t reduce spread of COVID-19                      | 21        | 10.7       |
| Never                                                       | 4         | 2.0        |
| Do you still shake hands during this Covid-era?             |           |            |
| Yes always                                                  | 38        | 19.4       |
| Yes Often                                                   | 43        | 21.9       |
| Yes sometimes                                               | 86        | 43.9       |
| No, I don’t                                                 | 29        | 14.8       |
| Hand hygiene (Use of soap and water and use of sanitizers)  |           |            |
| Soap and water for 40 seconds                               | 72        | 36.7       |
| Soap and water < 40 seconds                                 | 63        | 32.1       |
| Soap & sanitizer                                           | 25        | 12.8       |
### Table 3. Participants’ personal preventive measures against COVID-19

| Variables                                      | Frequency | Percentage |
|------------------------------------------------|-----------|------------|
| Sanitizer 5 seconds                            | 17        | 8.7        |
| Sanitizer 20 seconds                           | 6         | 3.1        |
| Neither use soap nor sanitizer                 | 13        | 6.6        |
| **Total**                                      | **196**   | **100.0**  |

| Variables                                      | Frequency | Percentage |
|------------------------------------------------|-----------|------------|
| What can be done to prevent contacting COVID-19|           |            |
| 1. Regular washing of hands                    | 72        | 36.7       |
| 2. Boosting immunity with vitamins             | 25        | 12.8       |
| 3. Mouthwash                                   | 1         | 0.5        |
| 4. Vaccine                                     | 6         | 3.1        |
| 5. Social distancing                           | 7         | 3.6        |
| 1&2                                           | 15        | 7.7        |
| 1&3                                           | 7         | 3.6        |
| 1&5                                           | 9         | 4.6        |
| 2&5                                           | 22        | 11.2       |
| 1&6                                           | 6         | 3.1        |
| 1-3                                           | 2         | 1.0        |
| 1,2&4                                         | 2         | 1.0        |
| 1,2&5                                         | 18        | 9.2        |
| 1,2,4,5                                       | 1         | 0.5        |
| 1-5                                           | 3         | 1.5        |
| **Total**                                      | **196**   | **100.0**  |
### Table 4. Association between participants' demographics and WHO hand washing recommendations for COVID-19 prevention

| Variables               | N (%) | N (%) | N (%) | N (%) | N (%) | N (%) | N (%) | Σ²  | P   |
|-------------------------|-------|-------|-------|-------|-------|-------|-------|------|-----|
| Hand washing with soap and water and use of sanitizers |       |       |       |       |       |       |       |      |     |
| Soap & water < 40 seconds | 26 (40.6) | 11 (44.0) | 11 (64.7) | 0 (0.0) | 2 (20.0) | 79 (40.3) |        |      |     |
| Soap & water 40 seconds | 29 (39.2) | 14 (56.0) | 6 (35.3) | 6 (100.0) | 8 (80.0) | 117 (59.7) |        |      |     |
| Sanitizer for 5 seconds | 38 (59.4) | 15 (62.5) | 9 (54.5) | 2 (11.8) | 2 (20.0) | 52 (62.5) |        |      |     |
| Sanitizer for 20 seconds | 14 (20.3) | 11 (44.0) | 6 (35.3) | 4 (23.5) | 4 (40.0) | 22 (50.0) |        |      |     |
| No washing of hands    | 8 (12.2) | 4 (16.0) | 3 (18.2) | 2 (11.8) | 2 (20.0) | 13 (25.5) |        |      |     |
| Total                  | 74 (100.0) | 64 (100.0) | 25 (100.0) | 17 (100.0) | 10 (100.0) | 196 (100.0) |        |      |     |
| Sex                    |       |       |       |       |       |       |       |      |     |
| Female                 |       |       |       |       |       |       |       |      |     |
| Male                   |       |       |       |       |       |       |       |      |     |
| Age group (years)      |       |       |       |       |       |       |       |      |     |
| 10-20                  |       |       |       |       |       |       |       |      |     |
| 21-30                  |       |       |       |       |       |       |       |      |     |
| 31-40                  |       |       |       |       |       |       |       |      |     |
| 41-50                  |       |       |       |       |       |       |       |      |     |
| 51-60                  |       |       |       |       |       |       |       |      |     |
| 61-70                  |       |       |       |       |       |       |       |      |     |
| >70                    |       |       |       |       |       |       |       |      |     |
| Education              |       |       |       |       |       |       |       |      |     |
| Secondary & below      |       |       |       |       |       |       |       |      |     |
| Diploma                |       |       |       |       |       |       |       |      |     |
| Bachelor               |       |       |       |       |       |       |       |      |     |
| Master/PhD             |       |       |       |       |       |       |       |      |     |
| Profession             |       |       |       |       |       |       |       |      |     |
| Students               |       |       |       |       |       |       |       |      |     |
| Self-employed          |       |       |       |       |       |       |       |      |     |
| Professionals          |       |       |       |       |       |       |       |      |     |
| Civil servants         |       |       |       |       |       |       |       |      |     |
| Retiree                |       |       |       |       |       |       |       |      |     |
| Monthly income         |       |       |       |       |       |       |       |      |     |
| <50,000 naira          |       |       |       |       |       |       |       |      |     |
| 51,000-100,000 naira   |       |       |       |       |       |       |       |      |     |
| 101,000-200,000 naira  |       |       |       |       |       |       |       |      |     |
| 201,000-400,000 naira  |       |       |       |       |       |       |       |      |     |
| >400,000 naira         |       |       |       |       |       |       |       |      |     |
| Total                  |       |       |       |       |       |       |       |      |     |
Table 5. Association between participants’ demographics and use of face mask

| Variables                  | N (%) | N (%) | N (%) | N (%) | χ² | P     |
|----------------------------|-------|-------|-------|-------|----|-------|
|                            | Yes, always | Yes, sometimes | No. it can’t reduce spread | Total |    |       |
| Sex                        |        |        |        |        |    |       |
| Female                     | 27 (37.5) | 46 (44.7) | 6 (28.6) | 79 (40.3) | 2.17 | 0.54  |
| Male                       | 45 (62.5) | 57 (55.3) | 15 (71.4) | 117 (59.7) |    |       |
| Age group (years)          |        |        |        |        | 14.00 | 0.73  |
| 10-20                      | 9 (12.5) | 7 (6.8) | 2 (9.5) | 18 (9.2) |    |       |
| 21-30                      | 31 (43.1) | 42 (51.9) | 8 (38.1) | 81 (41.3) |    |       |
| 31-40                      | 12 (16.7) | 29 (28.2) | 8 (38.1) | 49 (25.0) |    |       |
| 41-50                      | 8 (11.1) | 14 (13.6) | 0 (0.0) | 22 (11.2) |    |       |
| 51-60                      | 4 (5.6) | 4 (3.9) | 0 (0.0) | 8 (4.1) |    |       |
| 61-70                      | 7 (9.7) | 5 (4.9) | 2 (9.5) | 14 (7.1) |    |       |
| >70                        | 1 (1.4) | 2 (1.9) | 1 (4.8) | 4 (2.0) |    |       |
| Education                  |        |        |        |        | 17.37 | 0.04* |
| Secondary & below          | 13 (18.1) | 26 (25.2) | 7 (33.3) | 46 (23.5) |    |       |
| Diploma                    | 15 (20.8) | 28 (27.2) | 9 (42.9) | 52 (26.5) |    |       |
| Bachelor                   | 37 (51.4) | 43 (41.7) | 5 (23.8) | 85 (43.4) |    |       |
| Master/PhD                 | 7 (9.7) | 6 (5.8) | 0 (0.0) | 13 (6.6) |    |       |
| Profession                 |        |        |        |        | 8.79 | 0.72  |
| Students                   | 20 (27.8) | 26 (52.2) | 6 (28.6) | 52 (26.5) |    |       |
| Self-employed              | 28 (38.9) | 49 (66.6) | 7 (33.3) | 84 (42.9) |    |       |
| Professionals              | 5 (6.9) | 11 (10.7) | 2 (9.5) | 18 (9.2) |    |       |
| Civil servants             | 11 (15.3) | 12 (11.7) | 3 (14.3) | 26 (13.3) |    |       |
| Retiree                    | 8 (11.1) | 5 (4.9) | 3 (14.3) | 16 (8.2) |    |       |
| Monthly income             |        |        |        |        | 13.30 | 0.35  |
| <50,000 naira              | 27 (37.5) | 47 (45.6) | 14 (66.7) | 88 (44.9) |    |       |
| 51,000-100,000 naira       | 19 (34.5) | 32 (31.1) | 4 (19.0) | 55 (82.1) |    |       |
| 101,000-200,000 naira      | 14 (19.3) | 17 (16.5) | 3 (14.3) | 34 (17.3) |    |       |
| 201,000-400,000 naira      | 9 (12.5) | 6 (5.8) | 0 (0.0) | 15 (7.7) |    |       |
| >400,000 naira             | 3 (4.2) | 1 (1.0) | 0 (0.0) | 4 (2.0) |    |       |
| Total                      | 74 (100.0) | 64 (100.0) | 25 (100.0) | 17 (100.0) |    |       |
4. DISCUSSION

Following the COVID-19 epidemic, the World Health Organization (WHO) suggested the use of five personal protective measures to help prevent the infection from spreading throughout the population. These include using an alcohol-based hand rub (sanitizer) if hands are not visibly dirty or soap and water if hands are visibly dirty; avoiding touching the eyes, nose, and mouth; practicing respiratory hygiene by coughing or sneezing into a bent elbow or tissue and immediately discarding the tissue; wearing a medical mask if you have respiratory symptoms; performing hand hygiene after disposing of the mask; and maintaining social distancing. However, in February 2020, it was recommended that asymptomatic persons do not need to wear masks [16].

Covid-19 cases in Nigeria to date accounts for 7% of all confirmed cases worldwide [17]. However, this is under reported as there are undetected imported cases as well as unreported potential contacts of identified cases in the community [17]. The instruction from Nigeria Centre for Disease Control (NCDC) to practice WHO recommended personal measures, was initially adhered to by Nigerians but the majority stopped wearing facemasks because of their belief that Corona virus does not exist in the country because of the high tropical temperatures [17]. The question is if those who stopped the use of face masks were correct in their assumptions or if there are other factors present among Africans that made the case fatality to be low? There is the need to do further researches to evaluate the effectiveness of public mask-wearing in protecting healthy individuals from severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the causative agent of coronavirus disease (COVID-19) among Nigerians [18,19]. The prevalence of regular facemask use in this study was 35.2% and statistical significance analysis showed that education was associated with use. Participants who had at least tertiary education wore face masks. This is comparable to a study done in Germany that also reported that a university degree increased the likelihood of wearing mask among their participants [20].

Only about two-fifth (38.3%) regularly follow WHO recommended handwashing preventive measure techniques. A study done in Thailand reported that the risk for SARS-CoV-2 infection was negatively associated with personal protective measures with crude odd ratios decreasing among those who washed hands often (0.19), those wearing a mask all the time during contact with a COVID-19 patient (0.16) and those who maintain a distance of >1m from a COVID-19 patient (0.08) [21]. Other studies reported the effectiveness of mask wearing in influenza-like illness, SARS infection and SARS-CoV-2 infection [22-25].

Frequent hand washing has been shown to be very effective in reducing spread of infection [26]. Hand washing is a simple, low-cost intervention that have been proven to reduce transmission of epidemic respiratory viruses. A hand soap
solution (1:49) has been reported to have some effect (≥3.6 log10 reduction of viral infectivity) against SARS-CoV-2 in 5 min [27].

Although SARS-CoV-2 has never been detected on hands of the public population yet, it is reasonable to assume that the hand contamination by droplets from others may take place in the public with an unknown viral load [28]. Thus, decontamination of hands, especially after returning home from public places with many close contacts and potentially infected people is highly recommended.

WHO-recommended hand rubs based on 75% iso-propanol or 80% ethanol (both v/v) was found to inactivate SARS-CoV-2 in a study done to evaluate the effects of different concentrations of the original and modified WHO formulations I and II; ethanol, and 2-propanol for virucidal activity [29]. Similarly, another study done to investigate the activity of various disinfectants against SARS-CoV-2 using the sputum of a patient diagnosed with SARS in the isolation unit of Frankfurt University Hospital, Germany, reported that propanol-based hand rub inactivated SARS-CoV-2 [30]. The use of alcohol-based hand rub on a clean hand for decontamination has been reported to be effective against nosocomial pathogens including bacteria and yeasts and it is also better tolerated dermally [31-33]. The prevalence of handwashing and use of sanitizer in this study was 93.4%.

In this study, more females than males practiced WHO recommended hand hygiene while education influenced the use of face masks among the participants. This compares with the study done among 10 sub-Saharan African countries that reported that hand washing was influenced by age, gender and education. Younger, males and less educated participants had reduced odd of hand washing [34]. Other studies also reported an obvious gender distinction regarding the perception, behavior, and effectiveness of hand-washing [35,36]. This maybe because females pay more attention to personal hygiene than males and thus are more likely to follow hand-washing recommendations.

Physical distancing is an important measure in controlling COVID-19, but the exact distance to observe and for the duration of time that is safe are unclear. WHO recommended avoiding the 3Cs: closed, crowded and close contact and the practice of physical distancing of at least one meter. Furthermore, it has been advised that natural ventilation be increased by opening the windows and should be worn if crowded and indoor settings cannot be avoided [6].

However, a study reported that rules that stipulated a single specific physical distance of 1 or 2 meters between individuals in order to reduce the transmission of SARS-CoV-2, are based on an outdated, dichotomous notion of respiratory droplet size which overlooked the physics of respiratory emissions [37]. In respiratory emissions, droplets of all sizes are trapped and moved by the exhaled moist and hot turbulent gas cloud that keeps them concentrated as it carries them over meters in a few seconds [38,39]. After which, the cloud slows sufficiently and the ventilation, specific patterns of airflow, type of activity, viral load of the emitter, duration of exposure, and susceptibility of an individual to infection become very important [38,39].

The authors proposed graded recommendations that better reflect the multiple factors that combine to determine risk instead of single, fixed physical distance rules, as this will not only provide greater protection in the highest risk settings but also enhance greater freedom in lower risk settings and thus, potentially enable a return towards normality in some aspects of social and economic life [38,39].

Eighty two percent of our study participants did not practice physical distancing. This is not surprising as compliance with physical distancing directives has become a challenge as many failed in its adherence either due to ignorance or complete defiance [40]. Several cases of partial or zero adherence have been reported in most public places such as banks where customers seeking to gain access into banking halls clustered outside, among celebrities, some of who hosted house parties and on national television that displayed non-compliance with international standards during burial of some eminent Nigerians who died from COVID-19 infection [41].

5. CONCLUSION

There has been an improvement in handwashing since COVID-19 outbreak among the study population though the prevalence of face mask use was low. There remains room for improvement in use of WHO recommended personal protective measures.
6. LIMITATION

This study only assessed three out of the five WHO-recommended preventive measures against COVID-19.

DISCLAIMER

The products used for this research are commonly and predominantly used products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

CONSENT

All participants who consented to be part of the study.

ETHICAL APPROVAL

Ethical approval was given by the Hospital’s ethics Committee.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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