Research Article

DETERMINANTS OF SOCIO-DEMOGRAPHIC INFLUENCE ON ATTITUDE OF HEALTH CARE WORKERS REGARDING USE OF FACE MASK IN A TERTIARY HOSPITAL IN NIGERIA

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Abstract

Introduction: World Health Organization recommends on effective use of face masks as a means of protection of healthcare workers (HCWs) against respiratory hazards including COVID-19. There have been discrepancies in the attitude regarding the use of face masks generally. The purpose of this study was to explore the various determinants of socio-demographic influences of healthcare workers (HCWs) on attitudes regarding the use of face masks as a measure of infection prevention. **Materials and Methods:** This survey was conducted by interviewing 345 HCWs using a questionnaire consisting of demographic characteristics, and questions regarding their attitude toward the use of face masks. Each correct answer scored 1 and each incorrect answer scored 0. The total number of questions was 7 for the Attitude of healthcare workers on the use of face masks. The final aggregate score was calculated and then labeled according to the percentage of correct responses as good >50% and poor < 50% Attitude of health care workers on the use of face masks. Data were gathered and analyzed using SPSS software version 25. **Results:** A total of 345 participants (108 males and 237 females) were included in the study with the majority (78.3%) of them greater than 30 years and belonging to clinical Healthcare workers. About 72.5% of HCWs had a good attitude regarding the use of Face Mask. Age (p value=0.04), education (p-value =0.005), and profession (p value=0.0001) of Health care workers were found to have a positive influence on attitude regarding the use of face masks. Clinical Healthcare workers were found to be the only predictor of good attitude towards the use of face masks. **Conclusion:** The attitude of HCWs regarding the use of face masks was found to be good. Public awareness campaigns by Clinical Health care workers regarding the proper use of face mask is advocated by utilizing all social media, local languages, and other available resources. This may change the community's perception of the use of face masks.

Keywords: Determinant-Sociodemographic-Attitude– use of-facemask-HCWs-Nigeria.

INTRODUCTION

Though respiratory diseases are not new, they have continued to be a source of concern ranging from periodic flu to pandemic outbreaks. Respiratory organisms continue to afflict us to this day. There was a high rate of mortality in many countries of the world after being infected by the severe acute respiratory syndrome (SARS) coronavirus in 2003, and more deteriorated from the later H5N1 and H1N1 outbreaks[1,2]. In June 2012, a novel coronavirus causing SARS-like disease – human betacoronavirus 2c EMC/2012 (HCoV-EMC) – was found in the Middle East[3]. Even though the HCoV-EMC does not appear to be highly infectious[4], it was of utmostimportance that it became a public health problem for some countries to be prepared for an outbreak.It was reported to the World Health Organization on December 31, 2019, and on January 30, 2020, a new novel coronavirus recently named severe acute respiratory syndrome coronavirus 2(SARS-COV 2[5] was declared a Public Health Emergency of international concern (PHEIC).

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Internationally, lower respiratory tract infections are the third most common cause of mortality and the most common cause of death[6]for Infectious diseases. In Singapore, acute upper respiratory tract infection is the third most common reason for attendance at public primary care clinics; it is responsible for 11.1% of the 4.3 million attendances in 2010[7]. In other words, respiratory diseases have strained healthcare systems substantially and are a source of economic burden for many countries. Respiratory pathogens share resemblances in their mechanisms of spread (i.e. large droplet, aerosol, or fomite). Since some are infectious by the respiratory route[9], their transmission may be preventable with similar means by the use of a face mask. The use of a face mask is one of the effective infection control measures endorsed by the World Health Organization (WHO), and many countries including Nigeria implemented its use as part of their pandemic control measures[10,11]. "A facemask is a loose-fitting and single-use device that covers the nose, mouth, and chin"[12]. It is simple and provides a physical barrier against potentially infectious droplets[13]. The Centre for Disease Control (CDC) advocates the proper use of facemasks to realize the desired effect[12,13]. The proper use of a facemask includes the correct wearing method and practice[13]. The correctpractice of wearing a

facemask involves six steps: a) carry out hand hygiene before putting on the facemask; b) Make sure the mask covers the nose, mouth, and chin while compressing it against the sides of the face; c) perform hand hygiene before taking off the facemask; d) touch only the elastic bands during removal; e) ensure proper disposal of the used facemask in a paper bag or a lidded dust bin, f) perform hand hygiene after disposing of the facemask[14]. The correct practice of wearing a facemask entails wearing it to protect yourself or others[13,14]. It is suggested that individuals wear a facemask to protect themselves when taking care of sick family members with respiratory symptoms, visiting clinics or hospitals, relating with people who are not household members, and in public gatherings. All individuals with respiratory symptoms and those diagnosed with COVID-19 infection, even without symptoms are necessary to protect others by using face masks [10,14]. Low-income countries like Nigeria; where the incidence of infectious disease is high combined with poor nutritional and environmental conditions, will depend heavily on a facemask to protect its citizens against COVID-19 and to prevent its spread in the community[15]. That was why the Nigeria Centre for Disease and Control (NCDC) strongly advocates the use of facemasks in the community and also highlights their correct use[11].

Concerning the attitude of health professionals towards face mask usage, in one study[16], less than half 45.3% of the participants had a good attitude towards proper face mask utilization. This was much lower compared to the study done in the Dessie Amhara Region Ethiopia which accounted for 76.4% of the health workers had a favorable attitude[16,] This difference might be due to the difference in study area and tool, and similarly, it was lower compared to the study done in Malaysian public which accounted 83.1%[17] and ours(72.5%). These differences might be due to the quality survey conducted among healthcare workers in Vietnam which identified that most of the discussants had a reservation about face mask protection against respiratory disease. They also did not have ample data on the efficiency of face masks in the prevention of respiratory infection. Other respondents also raise the issue of face mask use might offend the patient's feelings[18].

Regarding the use of face masks, in general, the majority of the participants[29], both the general population and health professionals, stated compliance with this measure during the COVID-19 pandemic. The factors that considerably influenced this important control measure were sex, level of education, and whether the participant is a health professional or not. They highlighted three clinical trials[29], nevertheless one of them directly related to the use of facial masks as a central measure to control the spread of COVID-19 infection. A[19] non-blind, randomized, controlled trial was done to investigate whether the use of facial masks could reduce the risk of COVID-19. The authors concluded that the use of a face mask could be a protective factor against the infection[19]. However, more evidence is needed through strong clinical trials to offer reliable scientific evidence for references from health authorities. Another[20] meta-analysis concluded that the use of masks is an auxiliary method in measure of health and prevention during the outbreak of COVID-19 infection[20], which impacted by the level of knowledge, health literacy[21], different beliefs, moral values, and even conditions of access to health, as there is a paucity of data about sociodemographic predictors on HCWs attitude on the use of face mask in our environment.

The purpose of this study was to investigate the determinants of socio-demographic influence on the attitude of HCWs regarding the use of face masks in a tertiary hospital in Nigeria.

MATERIALS AND METHODS

We conducted a descriptive cross-sectional study of adult Health care workers in Federal Medical Centre[22], Asaba, in September 2020 for one month. The various Health Care Workers; doctors, nurses, pharmacists, physiotherapists, laboratory scientists, radiographers, and health attendants were grouped into two for the study. Those who worked directly with the patients in the wards. They had responsibilities related to diagnosis and treatment. They were considered`` Clinical Health Care workers" This represented the Doctors and the Nurses[23]. Those who did not work directly with the patients in the ward and had no responsibilities relating to diagnosis and treatment were considered ` Non-clinical Health Care Workers". This represented others[23].

The following were included in the study;

1. Those who have been in the employment of Federal Medical Centre for not less than 6 (six) months.
2. Those who were not in any way incapacitated.
3. Those who were willing to dispense information.
4. Those who gave consent and their confidentiality were maintained. Those who did not give consent were excluded from the study.

The sample size for the study was determined by using the formula for simple proportions[24].

$$[n= \frac{Z^2\,pq}{d^2}\,]^{24}$$

n = the desired sample size
Z = the standard normal deviate usually set at 1.96 (or more simply at 2), this corresponds to the 95 percent confidence level.
p = the proportion in the target population estimated to have particular characteristics. So 53% of the respondents had a good attitude (0.53) will be used[25].
q = 1.0-P = 0.47
d = Degree of accuracy desired, usually set at 0.05

$$N = \frac{1.96^2\,(0.53)\,(0.47)}{0.05^2}$$

$$= \frac{3.8416 \times 0.53 \times 0.47}{0.0025} = 382.77 = 383$$

10% non-response=38
Or 383-38=345.

Total= 345 which was the sample size

Systematic random sampling[26] was used for each of the workgroups. The sampling interval was derived using the formula below: Sample interval = a Total number of health workers/Sample size. From the total list of healthcare workers in the different categories, a sampling ratio was calculated for each category giving an Nth number of 3,

n=345 sample size
N=902 Total number of healthcare workers

Sampling fraction

345/902
N= 0.3825
Doctors 283x 0.3825 =108.2474 approximate 108
Nurses=456x 0.3825=174.42 □ 175
Pharmacist 52x 0.3825=19.89   Ω 20
Physiotherapist 8x 0.3825=3.06   Ω 3
Radiographers 9x 0.3825=3.4425 Ω3
Lab science 44x 0.3825=16.83Ω 17
Health attendant=50x 0.3825=19.125 Ω19

1. Doctors – 283/108=3
2. Nurses-456/175=3
3. Pharmacist-52/20=3
4. Physiotherapist-8/3=3
5. Radiographers 9/3=3
6. Lab scientist 44/17=3
7. Health attendant 50/19=3

Therefore every 3rd healthcare worker in each category was recruited for the study until the total number was gotten.

Data collection

The study was conducted by interview using a semi-structured questionnaire[25].   Data was gathered from 345 health professionals who worked at the Federal Medical Centre, Asaba, Nigeria and was analyzed using SPSS version 25, frequencies percentages, chi-square, and p-values were also computed. The Hospital had earlier set up an Infection, Prevention Committee, Which had one-week training on how to uphold the protocol on infection, prevention in January 2020. These trainings were stepped down to all the departments in the hospital in February 2020 for one month. The committee also supervised that there were face masks in the wards and recommended places in the hospital where such materials were placed for easy access to the Hospital Community. Six months later we decided to look at the Determinants of sociodemographic influences on attitudes regarding the use of face masks by Healthcare workers in our Hospital. Before the inception of the study, the nature and purpose of the study were explained to each respondent, and informed consent was obtained. The duration of the study was for one month (September 2020). For the convenience of analyses, the total number of questions to assess attitude was 7 (seven) and this was converted to a percentage score, a score of 50% and above will be termed a good attitude and a score of less than 50% will be the poor attitude.

Method of data analysis

Data were screened for completeness, entered, and analyzed using Statistical Package for Social Sciences (SPSS V. 20.0). The univariate analysis was carried out as quantitative variables using frequency, percentages, and mean value (standard deviation). The Bivariate analysis was also carried out between the sociodemographic variables on the attitude of use of face. Association was tested using the chi-square and by calculating the odd ratio with a 95% confidence interval. The level of significance was set at $P < 0.05$. Logistic regression (multivariate analysis) was applied in finding out the significant independent predictors of good attitude on the use of face masks.

Ethical issues/consideration

Ethical permission to conduct this research was gotten from the Research and Ethics Committee and the due processes in researching the hospital were maintained. The code of ethics aimed at protecting the rights of individuals used as subjects of the research was upheld. No harm or discomfort to the participants during the questionnaire distribution was allowed. Privacy and confidentiality were endorsed. Financial responsibilities were solely the researcher`s obligation.

RESULTS

Characteristics of the study subjects

Table 1. Socio-Demographic Characteristics of Healthcare workers

Sociodemographic information	Cases (n=247)	(%)
Age(in Years)		
Mean	36.0	
Range	21-59 years	
Group		
< 30 years	75	21.7
> 30years	270	78.3
Gender		
Male	108	31.3
Female	237	68.7
Marital Status		
Single	115	33.3
Married	230	66.7
Educational Level		
Poorly Educated	12	3.5
Tertiary Educated	333	96.5
Profession		
Clinical Health Care workers	274	79.4
Non-Clinical Health Care workers	71	20.6
Religion		
Christianity	340	98.6
Muslim	5	1.4
Years of Experience		
0-10 years	222	64.3
>10years	123	35.7

Table 2. The attitude toward the use of Face masks among the respondents

Attitude Questions	Response	N (%)
1. Wearing a face mask makes me confident to attend to a patient.	Agree(correct)	284(82.3%)
	Disagree	29(8.4%)
	Indifferent	32 (9.3%)
2. Do you feel it infringes on your freedom?	Agree	117(33.9%)
	Disagree(correct)	170(49.3%)
	Indifferent	58 (16.8%)
3. Do you feel that wearing a mask show vulnerability to covid-19?	Agree	62(18%)
	Disagree(correct)	257(74.5%)
	Indifferent	26(7.5%)
4. Do you think that wearing a face mask is necessary during this time of covid-19 pandemic?	Agree(correct)	322(93.3%)
	Disagree	9.0(2.6%)
	Indifferent	14 (4.1%)
5. Do you feel that the use of a face mask is discomforting?	Yes(correct)	255(73.9%)
	Disagree	48(13.9%)
	Indifferent	42 (12.2%)
6. Do you feel that wearing a face mask stigmatizes you?	Agree	41(11.8%)
	Disagree(correct)	271(78.6%)
	Indifferent	33(9.6%)
7. Do you feel confident wearing a mask outside the hospital?	Agree(correct)	256(74.2%)
	Disagree	44(12.8%)
	Indifferent	45(13.0%)

We enrolled 345 health workers in the study, with about two hundred and thirty-seven (68.7%) females. Their ages ranged from 21-59 years with a mean of 36.0 years. The majority of HCWs (78.3%) were >30 years of age. About two hundred and thirty (66.7%) of them were married.

Table 3. Aggregate Score of Health Care Workers on Attitude of use of Face Mask

Knowledge	Frequency	Percent (%)
Good	250	72.5
Poor	95	27.5
Total	345	100

On the educational level, many 333(96.5%) had tertiary education. About two hundred and seventy-four (79.4%) represented Clinical Health care workers. Christians (98.6%) represented the majority among the HCWs and Many of them 222((64.3%) with fewer than 10 years of experience in the profession. Two hundred and fifty(72.5%) of HCWs had a good attitude regarding the use of Face Mask, Table 3.

Two hundred and two (74.8%) respondents whose ages were greater than 30 years had good attitudes regarding the use of face masks compared to 48(64.0%) patients whose ages were 30 and below (Chi square=3.44, p value=0.04, 95% CI(0.97-2.88) (table 4). Two hundred and forty-six (73.9%)of the studied subjects that had tertiary education had a good attitude toward the use of face masks compared with 4(33.3%) of them who were poorly educated (Chi square=9.54, p-value =0.005, 95 % CI (1.66-19.25) (table 4). Two hundred and twenty-one (77.0%) of Clinical-Healthcare workers had a good attitude towards the use of face masks when compared with 39(54.9%) Non-Clinical Health care workers (Chi square= 13.77, p value=0.0001, 95% CI (0.21-0.63) (Table 4).

Table 4. Socio-Demographic relationship of HCWs on attitude with the use of Face Mask

Variables	Aggregate practice (%) Group		Chi-square	p-value	Odd ratio	95%CI
	Good attitude (%)	Poor attitude (%)				
Gender			0.507	0.28	0.83	(0.49-1.40)
Male	81(75.0)	27(25.0)				
Female	169(71.3)	68(28.7)				
Age			3.44	0.04	1.67	(0.97-2.88)
1-30 years	48(64.0)	27(36.0)				
>30 years	202(74.8)	68(25.2)				
Marital Status			1.86	0.11	1.41	(0.86-2.30)
Single	78(67.8)	37(23.2)				
Married	172(74.8)	58(25.2)				
Educational level			9.54	0.005	5.66	(1.66-19.25)
Poorly Educated	4(33.3)	8(66.7)				
Tertiary Educated	246(73.9)	87(26.1)				
Profession			13.77	0.0001	0.36	(0.21-0.63)
Clinical Healthcare worker	221(77.0)	63(23.0)				
Non-Clinical Healthcare workers	39(54.9)	32(45.1)				
Religion			2.68	0.13	4.04	(0.67-24.59)
Christianity	248(72.9)	92(27.1)				
Islam	2(40.0)	3(60.0)				
Years of experience			2.18	0.09	1.47	(0.88-2.44)
0-10 years	155(69.8)	67(30.2)				
>10 years	95(77.2)	28(22.8)				

Table 5. Socio-demographic Predictors of Good attitude among HCWs on use of face mask

Variables	B (regression coefficient)	p-value	Odds ratio(Exp B)	95% C.I. (Exp B)
Gender	0.211	0.447	1.235	0.716-2.129
Male			1	
Female				
Age	0.126	0.698	1.135	0.599-2.150
1-30 years			1	
>30 years				
Marital Status	-0.260	0.381	0.771	0.431-1.379
Single			1	
Married				
Educational level	-1.098	0.110	0.333	0.087-1.282
Poorly educated			1	
Tertiary educated				
Profession	0.743	0.019	2.103	1.127-3.923
Clinical Healthcare workers			1	
Non-Clinical Healthcare workers				
Religion	2.68	0.13	4.04	(0.67-24.59)
Christianity				
Islam				
Years of experience	2.18	0.09	1.47	(0.88-2.44)
0-10 years				
>10 years				

The only significant predictor of a good attitude from the logistic regression model was the profession of the patient. The Clinical HCWs was the only predictor of good attitude regarding the use of face mask with odds of 2.10 (p < 0.019) (table 5).

DISCUSSION

Face masks are a useful barrier to reduce the risk of transmission of respiratory infections[27]. However, for face masks to provide effective protection, the HCWs must have a willingness of wearing and disposing of them. This study examined the determinants of socio-demographic influence on the attitude of Health care workers regarding the use of face masks in a tertiary Hospital in Nigeria. The Majority of Healthcare workers were female (68.7%) above 30 years of age (78.3%) and mostly married (66.7%). The study also found that most of the staff attended tertiary (96.5%) education and hence were trainable. We observed that many had a good attitude (72.5%) toward the use of face masks in the survey, probably due to the training sessions organized by the Infectious disease prevention committees six months earlier before the study[27]. This good attitude is expected to help health professionals to adhere to needed infection and disease control measures. Concerning the attitude of health professionals concerning face mask utilization, in a study[28], less than half 45.3% of the respondents had a good attitude towards appropriate face mask utilization. This was much lower compared to another study done in the Dessie Amhara Region Ethiopia which reported that 76.4% of the health workers had a positive attitude[29]. This difference might be due to the variations in study area and tool, and similarly, it was also lower compared to the study done in Malaysian public which accounted 83.1 %[30].

The attitude toward the use of face masks among Health care workers in a Federal Medical Centre, Asaba, Nigeria showed that many (82.3%) are confident and willing to wear a face mask to attend to patients in the Hospital premises or outside the Hospital (74.2%).The majority (93.3%) also consider it necessary in this time of covid-19 pandemic to wear a face mask. These findings supported the hypothesis that attitude positively affects public willingness to wear(WTW)[32] face masks, which indicates that people who are thoroughly familiar with the COVID-19 pandemic have a higher propensity to wear face masks[31]. The previous research, [33] showed that attitude plays a significant role because people exhibit an optimistic attitude that wearing face masks could reduce the chances of being infected by viral respiratory diseases. Similarly, the study[34], showed that attitude has a favorable outcome on public WTW face masks. The findings of these studies conformto our results. Due to the recent global pandemic situation, many citizens have recognized that the usage of face masks can confront the spread of COVID-19 and help to solve the health predicament. However, HCWs in our study feel wearing a face mask is very discomforting (73.9%) despite their willingness to use the face mask. This may impact to some extent negatively to the practice of using of face mask

The cost and unavailability of face masks were also found to have a prohibiting effect on WTW[32]. This reinforced the fact that cost negatively affects public willingness. Previous research findings sustained this result as Kesselheim[35] found that cost hurt public willingness to use face masks, and the cost was a major hindrance to accepting new progress made in the

health sector. Chughtai and Khan[36] found that several factors add to the selection and use of face masks, such as cost, presence of adverse events, and pre-existing medical illness. Similarly, Weiss *et al.* acknowledged that public willingness was influenced by cost and that high costs prohibited individuals from buying face masks[37]. The WHO currently recommended that only HCWs and people who are ill and those who are caring for the ill need to wear a mask to protect themselves from COVID-19[25]. However, in low-income countries, where the incidence of infectious disease is high and the hospital environmental conditions are often poor, our HCWs rely almost entirely on a face mask to limit the spread of respiratory infections including COVID-19[38]. Demographic Factors and WTW Face Masks in addition to the proposed influencing factors, some demographic factors also affect public WTW face masks. For instance, Bish and Michie[39] studied the impact of demographic determinants on public WTW face masks and found that public willingness was significantly influenced by age and gender.

The results revealed that older people and females exhibit more defensive behavior than other groups of society. Condon and Sinha[40] obtained similar results, as females showed more willingness to use face masks than their male counterparts during the 2009 pandemic. This is not entirely different from our finding where profession, Educational background, and Age have a positive influence on attitudinal change behavior regarding the use of face masks. We discovered that clinical HCWs had a good attitude toward the use of face masks than Non-Clinical HCWs (p value=0.0001) (table 4). Those older than 30years are more likely to adhere to the use of face masks than the younger HCWs. The profession is the only predictor of good attitude regarding the use of face masks among Health care workers in Federal Medical Centre Asaba. We noted that our study design was limited to a single governmental hospital. We suggest a further Multi-centered study to be carried out to evaluate these findings in both private and government hospitals before the results could be generalized. The use of closed-ended questions may not have covered the whole range of answers relating to facemask use, thus a qualitative or informal interview may be required in further studies. Despite all these limitations, this study still provides valuable insights for further investigation into the attitudinal gaps in the correct use of face masks. Future studies should include alsocommunity-based studies to explore other factors related to attitudes on the use of facemask use.

Conclusion

The attitude of HCWs regarding the use of surgical face masks was found to be good. However other factors like cost, unavailability, and discomfort associated with the use of mask which has been found to negatively impact attitude (WTW) on the use of face mask need to be looked into. Efforts should be made to produce masks that are users friendly/comforting. Government has a priority to provide enough face masks in the Hospital for Health care workers who are on the frontline which will improve the practice of the use of face masks by Health care workers as means of infection prevention. Clinical-HCWs to lead in attitudinal change behavior as the study has shown by organizing training and re-training other HCWs. They should bring this to the doorstep of the general public as a change agent on the issue of attitude regarding the proper use of face masks in preventing infectious respiratory diseases.

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