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RELATIONSHIP BETWEEN BIAS CONSPIRACY THEORY AND UPTAKE OF COVID 19 VACCINES BY FRONTLINE HEALTH CARE WORKERS IN NORTH WEST ZONE, NIGERIA

By

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Abstract

This study investigated the relationship between bias conspiracy theory and uptake of covid-19 vaccine by frontline health care workers in North West Zone Nigeria. To achieve the purpose of the study, 2 research questions were raised and 2 hypotheses were formulated to guide the conduct of the study. Descriptive design of survey type was used for the study. The population for the study was 74,245 which comprised all frontline healthcare workers providing services in public health facilities across North Western States, Nigeria. The total of 600 respondents was selected using multistage sampling procedure. Researchers developed questionnaire was used to collect data for the study. The instrument was validated by three experts and pilot study was conducted in which reliability index of 0.90 and 0.75 were obtained. A total of 600 copies of the questionnaires were administered with the help of 16 trained research assistants out of which only 588 were duly completed, returned and used for the analysis. Frequency count and percentage were used to organized demographic characteristics of the respondents while Pearson Products Moment Correlation Coefficient (PPMC) was used to test hypothesis 1 and regression analysis was used to test hypothesis 2 and all test were performed at 0.05 alpha levels. The findings indicated that there is relationship between bias conspiracy theory and uptake of covid-19 vaccine $r = 0.119$, $df 2,586$ ($P < 0.05$). Frontline health care workers demographic variables have no significant relationship with uptake of covid 19 vaccine $f(4,583) = 1.728$ $P > 0.05$. It is therefore recommended among others that government should provide more covid-19 vaccine across all health facilities so as to stimulate uptake by all frontline healthcare workers irrespective of their demographic characteristics (age, gender, educational status and location), and conspiracy belief in the North West States of Nigeria.

Keywords: *Bias conspiracy theory, COVID-19 Uptake, Frontline health care workers*

Introduction

Coronavirus disease 2019 (COVID-19) is an infection caused by a novel coronavirus called severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which was first identified amid an outbreak of respiratory illness cases in Wuhan City, Hubei Province of the republic of China



(Center For Disease Control and Prevention (CDC) 2019). The novel Covid-19 pandemic has posed enormous challenges and become a burden of morbidity and mortality while severely disrupting economic activities around the globe.

The novel Coronavirus disease (COVID-19) pandemic is a global threat which the entire globe faced. In December, 2019, 71,554,018 cases and 1,613,671 deaths have been recorded across 213 countries and five regions of the globe as of 23rd December, 2020 (Ilesanmi , Olubumuyi & Afolabi, 2020). The World Health Organization declared the novel human Corona virus disease outbreak a public health emergency of international concern on January 30, 2020. As of February 2021, the pandemic has affected 223 countries with overall 104.37 million confirmed cases and 22.71 million deaths recorded globally (World Health Organization (WHO), 2021). A corona virus is a kind of common virus that causes an infection in your nose, sinuses, or upper throat. Most corona viruses are not dangerous.

In early 2020, after a December 2019 outbreak in China, the World Health Organization identified SARS-CoV-2 as a new type of corona virus. The outbreak quickly spread around the world (Brunilda, 2021). Covid -19 is a disease caused by SARS-CoV-2 that can trigger what doctors call a respiratory tract infection. It can affect your upper respiratory tract (sinuses, nose, and throat) or lower respiratory tract (windpipe and lungs) it spreads the same way other corona viruses do, mainly through person-to-person contact. Infections range from mild to deadly (Brunilda, 2021).

As with past outbreaks, the novel nature of the corona virus outbreak implied that no definitive therapy existed for its treatment, instead, empirical therapies are being employed in the management of the disease. The rapid spread of the virus and continuous increasing number of cases alongside the partial and/or total lockdown protocols in most countries necessitate the urgent development of accurate diagnostic methods, effective treatments and vaccines for the disease (Shih HI, Wu ,Tu & Chi, 2020). There was misinformation ranging from disbelieving the threat of COVID-19, politicization of the disease and conspiracy theories that vaccines could alter human DNA as well as reduce fertility in women.

Frontline health care workers are health care professionals working at the first contact level of healthcare delivery system (United State Agency for International Development (USAID), 2002). Frontline health care workers provide routine and essential in all setting including hospitals, out patients' care/departments, behavioural health, long term care and home care. They are responsible for a range of operations including direct care, environmental and technical services to patients, families and care givers. Healthcare employers are particularly dependant on workers at the frontline of care. Support and technical staff who provide direct care to patients and support health care practioners their ranks include nursing assistant, housekeepers, medical assistant, community health workers, dietary services workers and a host of others who work for



24/7 (Care stat, 2024). They help families identify health conditions and link families to specialty care when needed. They stand as trusted sources of information and help their communities prevent, detect, and respond to leading killers, including diarrhea, pneumonia, HIV, malaria, and tuberculosis, as well as emerging threats like Ebola and Zika (Health Workers Colliation, 2019). Vaccines are especially needed by health care workers on the front lines and other vulnerable (people with underlying medical conditions, elderly people and people providing special services) members of the population who are at higher risk of contracting the infection (Itodo, Enitan, Oyekale, Agunsoye & Asukwo, 2020; Nunneley, 2020). Vaccination with safe and effective Covid -19 vaccines is critical part of Nigeria strategies to interrupt the Covid-19 pandemic and as well curb transmission of the virus. In Nigeria immunization is designed to prioritize people mostly at-risk based on evidence base data. The country goal is to introduce the vaccine in phases and equitable manner, ultimately vaccinating Nigeria eligible population within two years to ensure herd immunity. Vaccination of frontline health care workers, port of entry (air, land and sea ports), military, Covid -19 rapid response team, laboratory network, policemen, petrol station workers and contingency are the aim of the government in the first instance (National Primary Health Care Development Agency (NPHCDA), 2021).

Aside from the technological and medical hurdles involved in vaccine production, one of the major challenges of the vaccine industry is vaccine hesitancy, which is a delay by health care workers in accepting to be vaccinated or refusing its use altogether and danger of this is the unnecessary prolongation of the pandemic notwithstanding this could lead to additional loss of lives among frontline health care workers especially those who may have legitimate reasons (example vaccine stock out) for not taking the vaccine (Onyeka, Valentine, Precious, Chioma, Nehemiah & Michel, 2021).

Doughlas, (2019) define conspiracy theories as an attempt to explain ultimate causes of significant social and political events and circumstance with claims of secrete plot by two or more powerful actors. Bias conspiracy theories arises for virtually any public events (pandemic, assassination, disaster) in light of positively correlated endorsement of such beliefs (Franken & Imhoff, 2021). People who believe in one conspiracy also tend to believe in others. The assumption of a general mindset relies basically on the robust empirical evidence that conspiracy items are interrelated (Goertzel 1994).

According to Vandenberg and Brian, (2019) Conspiracy theories attempt to explain harmful or tragic events as a result of the actions of a small powerful group. Covid-19 conspiracy theory is also regarded as an organized fabricated misinformation against Covid-19 vaccination. Bias conspiracy theory is a false beliefs healthcare workers hold in relation to covid 19 vaccination. As the covid 19 crises worsen, the world also faces global misinformation pandemic. Conspiracy theories that behave like viruses themselves are spreading rapidly online as severe acute



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respiratory syndrome (SARS)-Cov -2 does offline. With the distribution of vaccines underway, Fears expressed by Nigerian health care worker regarding vaccine trial include: fear of adverse effects, complications, disruption of daily routine, potential mutation, implantation of a microchip, racism, foreign attack, dominance and depopulation of the black race, as well as fear of death. It is shocking that till date; many people do not believe that COVID-19 exists including frontline health care workers. Others are of the opinion that the pandemic was caused by installation of the 5G Network. Worst still, some think that COVID-19 is a myth, joke, political scam, fall-out of economic war between world powers, a biological weapon, a laboratory escape or vaccine trial that went wrong. In some places people do not believe in Covid-19 existence, the virus is tangible not very concrete and for some individual, it's really hard to accept a flu-like illness could be a life threatening (Dawn 2020). Some believes that Covid-19 is a business for healthcare workers and doctors are diagnosing every fever as Covid-19 for their benefits. There is also a claimed that Covid-19 is a preplanned project to cover the Bill gates trackable microchips conspiracy (BBC News, 2020). Conspiracy theorists that promote or formulate them often reject the standard or accepted explanation of unexplained or unusual events and claim that they are the doing of evil conspirators secretly conspiring behind the scene (Dictionary.com 2021).

The Nigerian Former Minister of Health, Dr. Osagie Ehanire has stated that investigations reported that 50-60% of the deaths that occurred in Kano (North West Zone) during the covid 19 pandemic may have been triggered or due to corona virus. It was further lamented that 150 Kano State healthcare workers were infected at the time the Ministerial Task team to Kano arrived (This day, 2020). According to Neyu (2020), 144 health care workers tested positive in Kaduna state as of April 2020. Also 14 out of 35 confirmed cases in Katsina state are health care workers in which five died. Over 800 Nigerian frontline health care workers have contracted the novel corona virus since the first case was confirmed in February 2020. At least 812 health care workers infected, they are not just numbers, 29 of them work with NCDC as stated by Chikwe Ihekweazu, director general of Nigeria Centre for Disease Control. The incidence of morbidity and mortality continues to rise among frontline health care workers as they continue to be in direct contact with numerous infectious cases. Over a thousand Nigerian healthcare workers had tested positive for the virus in less than a year with many mortalities (Olufemi,Luther & Yusff 2020).

Study have shown that healthcare workers themselves, including those who provide vaccination to patients, are vaccine-hesitant, whether considering vaccination for themselves, their children, or their patients (Kelly, Dutheil,Haniez, Boudet, Rouffiac & Traore 2008; Qureshi, Hughes, Murphy & Primrose, 2004). Vaccine hesitancy among healthcare workers including doctors, nurses as well as those who deliver direct care and services (laboratory technician and medical waste handlers) was found. This is attributable to conspiracy theory as observed by the researcher.



It is against this background, the researcher investigated the relationship between bias conspiracy theory and uptake of COVID-19 vaccine by frontline health care workers in North West Zone, Nigeria. This study addressed the following research questions.

Research Questions

1. What is the relationship between bias conspiracy theory and uptake of covid 19 vaccine among frontline health care workers in North West Zone Nigeria
2. What is the relationship between demographic variables and uptake of covid 19 vaccine among frontline health care workers in North West Zone, Nigeria

Hypotheses

The following hypotheses were formulated to guide the study.

1. Bias Conspiracy theory does not have significant relationship with uptake of covid 19 vaccine in North West Zone Nigeria.
2. Frontline health care workers demographic variables do not significantly relate with uptake of covid 19 vaccine in North West Zone Nigeria

Methodology

In this study, survey design of descriptive type was used to guide the research. The populations of the study comprised all frontline health care workers working in public health institutions in North West Zone Nigeria which is estimated at 74,245 (Kano State Ministry of Health, Human resource for health, 2019, Kaduna state Ministry of health, 2020, Zamfara State MOH Planning Research and Statistic (2023)., Jigawa state government, 2021, Kebbi State Ministry of Health 2022, Sokoto State Ministry of Health 2015, & Katsina State Ministry of Health 2015). The sample of 600 respondents was selected for the study which was base on slovin's formula for determining sample size which arrived at 400 after which 50% of the sample size was added. The addition was due to the nature of the study that demands larger number of respondents.

The sample was selected using multistage sampling techniques. Stage one simple random sampling techniques was used to select three out of the seven state of the North Western Zone, Nigeria, namely Kano, Jigawa, Kaduna, Katsina, Sokoto, Zamfara and Kebbi state through display of pieces of paper carrying names of the state where by Kano, Kaduna and Zamfara state were selected. Stage two Purposive sampling techniques of homogeneous type was used to select old and populous Federal medical centers, Teaching hospital, Specialist hospital and General Hospital. The selection of these hospitals was due to their high number of services they render



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which attract high number of clients as well as high number of frontline health care workers that need to be immunized against Covid-19 vaccine. Stage three Proportionate sampling techniques was used to select number of respondents from each health facility in order to arrive at 600 respondents by dividing total number of HCWs in the HFs with grand total of the number of HCWs in the selected HFs multiply by sample size. Stage four Availability sampling technique was used to select respondents from each health facility.

Researcher self developed questionnaire was used on the relationship of bias conspiracy theory and uptake of Covid-19 vaccine among front line healthcare workers in North West State Nigeria. The instrument was titled ‘‘**Bias Conspiracy Theory and Covid-19 Vaccine Uptake Questionnaire (BCTCVUQ)**’’. Face and content validity of the instrument was checked by three experts from the Health Education and Promotion department, Bayero University Kano. All corrections, suggestions, comments and observation were incorporated to the satisfaction of the research supervisor in to the final draft before pilot study. To determine the reliability of the instrument, a pilot study using 50 respondents was conducted at Nguru Federal Medical Center Yobe state. Split half method of reliability using Spearman’s brown prophecy formula was used to analyze the data to determine the strength of the instrument. Reliability index of 0.90 and 0.75 was obtained for bias conspiracy theory and covid 19 vaccine uptakes respectively.

Descriptive statistics of simple frequency counts and percentage was used to organized and described the demographic data of the respondents, while Pearson product moment correlation coefficient was used to analyzed hypothesis one and Regression analysis was used to analyze hypothesis two. All hypotheses were analyzed at 0.05 level of significance.

Results

Table 1: Demographic characteristics of the respondents

Variables	Frequency	Percentage
Gender		
Male	286	48.6
Female	302	51.4
Total	588	100
Age		
20-30	298	50.7
31 & Above	290	49.3
Total	588	100
Education		
Diploma	294	50
Degree	207	35.2
High degree	87	14.8
Total	588	100



Residence		
Rural	249	42.3
Urban	339	57.7
Total	588	100

As shown in table 1. Gender of respondents indicated that 286 (46.6%) were male while 302 (51.4%) were female. This indicated that female have the highest respondents than male. This might be due to the location of the health facility which is mostly in the urban areas where females prepare the work than rural. Ages of respondents 20-30 years were 298 (50.7%) while 290 (49.3%) were within the age range of 31 years and above. This indicated that respondents aged 20-30 years have the highest number of respondents this could be due to regular recruitment of new staff and retirement of older staff. On education respondents with diploma were 294 (50%) while respondents with degree were 207 (35.2%) and respondents with high degree were 87 (14.8%). This indicated that respondents with school Diploma were more in number against other qualifications and could be due to the age of the respondents. With regards to place of residency, 249 (42.3%) respondents reside in rural areas while 339 (57.7%) respondents were residing in urban areas. This indicated that participants from the urban areas have the highest number of respondents than those in the rural areas. This could be due to more health facilities and staffs were in the urban areas when compared to rural areas.

Hypothesis 1: There is no significant relationship between bias conspiracy theory and uptake of covid-19 vaccine by frontline healthcare workers in North West Zone, Nigeria.

Table 2: Summary of correlation analysis between bias conspiracy theory and uptake of covid 19 vaccine among frontline health care workers in North West State, Nigeria.

Variables	N	Mean	SD	Df	r	Prob.
Bias Conspiracy	588	14.5493	4.25418	586	.119	.004
Uptake of covid-19	588	17.7143	3.49056			

$r = .119, df 2,586$ ($P < 0.05$)



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Table 2 Shown correlations analysis to determine relationship between frontline health care workers bias conspiracy theory and uptake of covid 19 vaccine. A mean of 14.55 and standard deviation of 4.25 was obtained for bias conspiracy theories and mean of 17.71 and standard deviation of 3.49 for uptake of covid 19 vaccine. Statistical computation indicated that $r = .119$ df 586 ($P < 0.05$). This shows that there is significant relationship between bias conspiracy theory and uptake of covid-19 vaccine among frontline health care workers and therefore the null hypothesis is rejected on the account that relationship exist.

Hypothesis 2 Frontline healthcare workers demographic variables do not significantly relate with uptake of covid 19 vaccine in North West Zone, Nigeria.

Table 3. Regression summary on demographic variables relationship with uptake of covid 19 vaccine by frontline health care workers.

Model estimate	R	R square	adjusted R square	Std error of estimate
1	.108	.012	.005	3.48193

Table 4: ANOVA Summary

Model	sum of square	df	Mean square	F- cal	P- value
Regression	83.785	4	20.946	1.728	.142
Residual	7068.215	583	12.124		
Total	7152.000	587			

$f(4,583) = 1.728$ $P > 0.05$

Model

Since R square 0.012 there is no relationship. r –coefient of determination is adjusted R square test goodness of fit=0.005 is a fair fit P from ANOVA is $0.142 > 0.05$ $F(4,583) = 1.728$ $P > 0.05$. Estimated model coefficient shows that all the four demographic variables (Gender 0.579) (Age 0.153), (educational status 0.816) and (location of residency 0.312) do not predict uptake of covid 19 vaccine.



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Multiple regression was run on weather gender, age, education and location of residence predict uptake. This variable do not significantly predict uptake of covid 19 vaccine. $f(4,583) = 1.728$ $P > 0.05$.

Discussions

The research was conducted on the relationship between bias conspiracy theory and uptake of covid-19 vaccine by frontline healthcare workers in North West Zone Nigeria. The trend of covid-19 vaccine uptake by frontline healthcare workers was not understood in the past despite the important role the vaccine play in the control of the covid 19 pandemic. However there was variability across all frontline health care workers towards uptake of covid 19 vaccine in the North West Zone, Nigeria.

Finding on hypothesis I revealed that frontline healthcare workers bias conspiracy theory significantly relate with uptake of covid 19 vaccine $P < 0.05$. This might be as a result of wide spread misinformation about covid 19 vaccine among the general populace frontline healthcare workers inclusive. This finding supported the finding of Masele, (2024), who conducted study on Misinformation and Covid-19 vaccine uptake hesitancy among frontline workers in Tanzania which revealed that manipulated, misleading, fabricated, imposter, satire or false content was the dominant form of misinformation determining to Covid-19 vaccine uptake hesitancy mentioned by 161 (80.6%) respondents. The finding is also in agreement with related study by Oyeyemi, Fagbemi, Busari, and Rolf (2022), on health workers' beliefs in covid-19 conspiracy theories, level of trust in government information and their willingness to take covid-19 vaccine: a survey from Nigeria which indicated a high proportion of the sampled HCWs believed that Covid-19 vaccines contained microchips, and or that the vaccines could alter recipients' DNA and genetic information. This might have negative consequences in terms of their own Covid-19 vaccination and on their influence on other people. Lack of trust in government and its institutions might explain the belief in both conspiracy theories and vaccine hesitancy. The finding was also supported by Iliyasu, Garba, Aliyu, Gajida, Amole, Umar, Abdullahi, Tsiga-Ahmed, Kwaku and Kowalski, (2022), study conducted on I Would Rather Take the Vaccine Than Undergo Weekly Testing Correlates of Health Workers' Support for COVID-19 Vaccine Mandates in Aminu Kano Teaching Hospital (AKTH) which revealed that most FHCWs were still hesitant, and even those who had the vaccine never completed the recommended dosage due to safety



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concerns, rumors, and perceived invincibility:“Vaccine uptake among hospital staff is still low. Some have received the recommended dose(s) of the COVID-19 vaccine including booster, while others are yet to do so. Some received a single dose and are afraid to complete the doses because they are still not convinced of the risk to African and are concerned about vaccine safety from social media hype. They have a deep-seated belief that the vaccine is harmful and could cause problems in the long run.

The finding on hypothesis II revealed that frontline healthcare workers demographic variables do not significantly relate with covid 19 vaccine uptakes in North West Zone Nigeria. This could be as a result of differences in the cadre of frontline health care workers in which some health care professionals are not trained on immunization because it is not included in their training syllabus. The study is in line with study by Mahmood, Ashiru, Shettima, Abdullahi, Ngulde and Abbas (2023), on Personality traits as key determinants of Covid-19 vaccine uptake among healthcare workers in Nigeria which revealed that Sociodemographic variables were not significantly related to Acceptance of covid-19 vaccine among health care workers. The finding was also supported by a study conducted by Onyeka at’el (2021) on Covid-19 Vaccine Knowledge and Acceptability Among healthcare providers in Nigeria in which relationship between willingness to accept Covid-19 vaccine and socio-demographic characteristics of the respondents was not statistically significant. The finding is contrary to Mazin at’el (2021) who conducted study on Covid-19 vaccine uptake among healthcare workers in the fourth country to authorize BNT162b2 during the first month of rollout which revealed significant relationship between frontline health care workers demographic variables and covid 19 vaccine uptakes as $P < 0.001$

Conclusion

The findings of this study signify that there is relationship between bias conspiracy theory and uptake of COVID 19 vaccines in north western state of Nigeria. Frontline health care workers’ demographic variables have no significant relationship with uptake of COVID-19 vaccines in north west zone, Nigeria



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