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Knowledge, Attitudes, and Hesitancy to COVID-19 Vaccination Uptake in Nigeria

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This is to certify that the doctoral dissertation by

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2024

Abstract

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by

Dominique Mbachie

MSN, Grand Canyon University, 2018

BSN, University of the District of Columbia, 2011

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

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Abstract

Vaccine hesitancy is a major global health problem despite their being historically effective at preventing infectious diseases such as tetanus, diphtheria, polio, rabies, pertussis, measles, and yellow fever. It has significantly hampered herd immunity, with a rate of 67% for COVID-19 globally. Vaccine hesitancy is common in underdeveloped nations like Nigeria. Misinformation and rumors may be the foundation of the lower vaccination rates in impacted African nations, particularly Nigeria. Thus, the Nigerian population has primarily remained unvaccinated or hesitant about COVID-19 vaccination uptake. This qualitative study explored the knowledge and attitudes towards hesitancy regarding COVID-19 vaccination uptake in Nigeria. The health belief model guided the study. Purposive and snowballing sampling strategies were used to select 18 participants ages 18 to 60 years who were unvaccinated from across Nigeria. NVivo qualitative data analysis software was used to analyze the data collected. The study findings suggest that the participants' attitude towards hesitancy to COVID-19 vaccination uptake remains unchanged, indicating persistent low uptake of COVID-19 vaccine among the population. Implications for positive social change include encouraging collaboration between policy actors in health management. Working with stakeholders and the community, this health team can create social awareness through trusted social media networks and health centers and have transparent scientific data readily available to the community for verification to rekindle trust in vaccine programs in Nigeria.

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Dedication

This study is dedicated to the memory of my dad, Shagbaor Francis Tsetim Mbachie, whose belief in hard work and support for learning, especially the education of a girlchild, was unwavering. He once mentioned, “Education empowers a woman to provide for herself and her children without unnecessary compromise.”

Dad, this is for you.

Your daughter – Wan Agbakyor

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Navigating through the many turns to education excellence was challenging. Still, God's grace and support from Walden University, my Family, friends, colleagues, my Catholic faith, and many others contributed in one way or another to make it a success. Thus, I thank those who supported me through prayers, shared their resources, cheered me on with words, phone calls, visits, and covered work shifts.

My Family, you are the best; thank you for looking favorably on my continued engagement in learning. I greatly appreciate you, Chad Nsikan Tersoo Esu (son), love always. Shagbaor Francis T (late) and Mrs. Francisa H. Mbachie (parents), I am eternally grateful for your nurturing abilities, hard work, resilience, and empathy for all. Hon Justice Aondover (OFR) and Mrs. Magdalyn Kakaan, you effortlessly became the pillar of support upon the passing of our father. May you be richly rewarded.

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Chapter 1: Introduction to the Study

Introduction

Vaccines have historically been effective at preventing infectious diseases such as tetanus, diphtheria, polio, rabies, pertussis, measles, and yellow fever (Chukwuocha et al., 2018). Routine vaccination and extended vaccination programs have increased the number of people vaccinated (Chukwuocha et al., 2018; Ilesanmi et al., 2021a). With significant geographical variation, surveys conducted in 2021 revealed that 50% and 60% of respondents globally were likely to embrace the novel coronavirus (COVID-19) vaccination (Razai et al., 2021). However, Nigeria's COVID-19 vaccination rate is below 50% because the target to vaccinate over 111 million eligible individuals by the end of 2022 was not attainable (Onyedinefu, 2022). Onyedinefu (2022) reported that 10,139,483 individuals received a complete COVID-19 vaccine, and 19,408,426 were partially vaccinated. This is below the set target of 111 persons in 2021. Garrett and Young (2021) maintained that misinformation and rumors may be the foundation of lower vaccination rates in impacted African nations, particularly Nigeria.

Despite the lethal nature of COVID-19 and the apparent achievement in vaccine development, resistance is still a barrier globally (Ojewale et al., 2021). Due to a combination of factors, including misinformation about vaccines, vaccination hesitancy is prevalent in numerous world countries (Dubé et al., 2016; Fisher et al., 2020; Ojewale et al., 2021). The delay in accepting or outright rejecting vaccines, known as vaccine hesitancy, has been identified as an increasing global health risk (Marti et al., 2017; Sato & Fintan, 2020).

According to research, complex, context-specific traits that differ across time, place, and different vaccines contribute to vaccine hesitancy. Larson et al. (2014) believed that factors such as complacency, convenience, confidence, and sociodemographic settings impact vaccine hesitancy. Research studies have shown that the propagation of false information and conspiracy theories, notably on social media, may factor in people's hesitancy to get vaccines (Duffy et al., 2020; Mills et al., 2020). Structural variables contributing to low trust in vaccines and low uptake include health inequities, socioeconomic disadvantages, institutional discrimination, and access restrictions (Razai et al., 2021a; Razai et al., 2021b; Robinson et al., 2020).

There is a variety of causes contributing to vaccine hesitancy. The cognitive, psychologic, sociodemographic, political, and cultural aspects that cause vaccine hesitancy vary between populations (Sallam, 2021). Hesitancy to get the COVID-19 vaccination might be an example of a cause-and-effect relationship, and several approaches could be applied to investigate the causes.

The health belief model (HBM) states that when people believe they are more susceptible to infection, they are more likely to adopt and adhere to disease-prevention measures (Tarkang & Zotor, 2015). This evidence points to the necessity of assessing people's beliefs and behaviors toward vaccine uptake for disease prevention, such as the COVID-19 vaccination. The Nigerian population has primarily remained unvaccinated or hesitant about COVID-19 vaccination uptake (Nigeria Primary Health Care Development Agency, 2023). This study explored the phenomenon of vaccine hesitancy through the

HBM lens to further describe COVID-19 vaccine hesitancy among unvaccinated adults between the ages of 18 and 60 years in Nigeria.

In this Chapter, I describe the study, its historical context, and the issue that inspired the investigation. I state the purpose of the study, research questions, and a brief discussion of the theoretical framework adopted as the foundation of this study. Other presentations include the following topics: the nature of the study, definitions of terms, assumptions, scope and delimitations, limitations, significance, and summary.

Background to the Study

COVID-19 is a global hazard that has affected the entire world (Afolabi & Ilesanmi, 2021b; Ilesanmi et al., 2020c). Herd immunity was proposed as a potential cure during the early stages of the COVID-19 pandemic when there was no known COVID-19 vaccine or treatment to combat the COVID-19 virus (Altmann et al., 2020; Ilesanmi et al., 2020d). Nevertheless, according to estimates, herd immunity will only develop once COVID-19 is exposed to 67% of the world's population, whether vulnerable or healthy (Altmann et al., 2020). Ilesanmi et al. (2020a) found that in the West African sub-region, it will require 261 billion cases and almost 5 million deaths (with a 2% case fatality rate) to attain herd immunity. As of July 25, 2022, out of 8,877,980 COVID-19 confirmed cases and 171,954 confirmed COVID-19 deaths on the African continent, Nigeria has documented 255,836 COVID-19 confirmed cases and 3,143 COVID-19 deaths (World Health Organization [WHO], 2022).

The countermeasure against COVID-19 is vaccination, although significant vaccination uptake is necessary for it to be effective (Cascini et al., 2021). High

vaccination rates are required to enable indirect community protection (Dube et al., 2013). High vaccination rates are also essential for attaining herd immunity to stop the spread of COVID-19 and lower the risk of infection in public and among those most susceptible (Randolph & Barreiro, 2020; WHO, 2023). Thus, 82.5% of the population may receive vaccinations to achieve herd immunity (Cascini et al., 2021; Ke et al., 2021). The benefit of the vaccine uptake is a significant decrease in COVID-19-associated morbidity and mortality; hence, high uptake of COVID-19 vaccines is required to ensure maximal effectiveness within the worldwide population (Crawshaw et al., 2021; Vasilelou et al., 2021).

Nonetheless, despite the public health efforts to increase vaccine uptake in Nigeria, many people contest COVID-19 existence. In contrast, others believe it to be a tool for political corruption (Ilesanmi & Afolabi, 2020b). Despite the misconceptions, the prevalence of mortality associated with COVID-19 makes it impossible for even skeptics to discount the virus' existence. COVID-19 vaccine availability in underdeveloped countries, including Nigeria, is observed by researchers to be parallel to COVID-19 vaccine hesitancy, which many believe is due to doubts about COVID-19 among many people in the country (Ilesanmi & Afolabi, 2020b).

Public health professionals and government officials in numerous African nations have blamed delayed response actions by their governments for the public's mistrust in the COVID-19 epidemic response throughout Africa (Afolabi & Ilesanmi, 2021). It is unlikely that anyone who believes COVID-19 is a hoax will receive the vaccine to ward off the illness. Moreover, people who believe the COVID-19 vaccine is harmful and a

money-making scheme will likely forego it. People are less likely to heed the advice and receive vaccinations if they believe that the medical and government organizations engaged in vaccine distribution and that the recommendations are unreliable (Fisk, 2021). These myths, therefore, can prevent the COVID-19 vaccination from achieving its potentially great successes (Afolabi & Ilesanmi, 2021).

Knowledge of the factors contributing to COVID-19 vaccine hesitancy is essential for advising policymakers and creating direct intervention methods that can significantly increase COVID-19 vaccine uptake because mandating vaccination is highly implausible, especially in an individualistic society (Cascini et al., 2021). In this study, I explored why some Nigerians remain unvaccinated or hesitant about COVID-19 vaccination uptake, explicitly focusing on knowledge, attitude, behavior, and belief. The research study helped bridge the gap in the study phenomenon, generated findings, and added to the body of knowledge to promote positive social change.

Problem Statement

Vaccines are a public health success (Amuzie et al., 2021). Nonetheless, people and organizations still oppose vaccines despite their widespread availability and success in disease management (Amuzie et al., 2021). Vaccine hesitancy is a significant challenge to global health (Cascini et al., 2021; Iliyasu et al., 2021). The WHO defined *vaccine hesitancy* as a delay in the acceptance or refusal of safe vaccines despite the availability of vaccine services (as cited in Razai et al., 2021). Vaccine hesitance inhibits COVID-19 vaccination uptake among countries (for example, Nigeria), posing a severe challenge to

governments and public health specialists in combating the pandemic (Okoli et al., 2019; Quinn et al., 2019).

Globally, vaccine hesitance is a significant barrier to achieving herd immunity, with a rate of 67% for COVID-19 (Altmann et al., 2020; Randolph & Barreiro, 2020). According to Neumann-Bohme et al. (2020), there are varying outcomes on COVID-19 vaccination uptake, with percentages as low as 37% and as high as 86%. Thus, the introduction and integration of innovative health interventions, such as the COVID-19 vaccination, are influenced by several factors, including demographic, individual, sociopolitical, financial, and cultural (Tobin et al., 2021).

Fisk (2021) categorized the causes of vaccine hesitancy into two groups: structural and attitudinal impediments. Structural barriers or systemic problems may restrict an individual's access to vaccination services. *Attitudinal obstacles* are ideas or preconceptions that could make someone less likely to request or accept vaccination services. The ability of the Nigerian health system to provide vaccines for persons at high risk and the desire of the public to get vaccinations are two other crucial factors that could influence vaccine distribution or uptake (de Figueiredo et al., 2020).

Sato and Fintan (2020) stated that vaccine hesitancy is common in underdeveloped nations like Nigeria. For instance, Islamic clerics in Nigeria reportedly abstained from the 2003 polio vaccination campaign because they lacked confidence in its effectiveness (Jegede, 2007). Vaccine reluctance is another factor contributing to vaccination noncompliance in Nigeria (Sato, 2020; Sato & Fintan, 2020). Thus, the uptake of vaccines may not always correlate with availability (Ojewale et al., 2021). On

March 5, 2021, Nigerians started receiving COVID-19 vaccinations (WHO, 2022). Nigeria boasts an extensive population index estimated at 216,211,493 as of February 28, 2022; 17,914,944 people had received their first COVID-19 vaccination, and 8,197,832 received their second dose (WHO, 2022).

In Nigeria, vaccination coverage rates are influenced by various factors, including ethnicity, culture, religion, and other sociodemographic factors (National Bureau of Statistics [NBS], 2018). Disparities are also visible when comparing rates depending on literacy levels, family wealth index, and caretaker age (NBS, 2018). According to research, political and religious differences, a lack of community involvement, and public mistrust of the objectives of the government and the international community might obstruct a vaccination campaign for the benefit of the general population, with disastrous outcomes (Jegede, 2007).

A significant challenge to completing COVID-19 vaccination in communities is citizens' acceptance of COVID-19 immunization in the face of misinformation and contradictory information that could deter acceptance (Adetayo, 2021). Thus, vaccine hesitation is affected by sociodemographic factors such as sex, age, education, income, religion, income, employment, and having children at home, among others (Amuzie et al., 2021; Barry et al., 2020; Khubchandani et al., 2021; Lazarus et al., 2021; Murphy et al., 2021; Oluwatemitope et al., 2021; Sallam, 2021; Shekhar et al., 2021; Troniano & Nardi, 2021; Wang et al., 2020a). Other factors inhibiting vaccine uptake are health-related factors, such as risk perception, severity, knowing someone with COVID-19, and comorbidities (Murphy, 2021). Vaccine-related knowledge (for example, vaccine

confidence, source of vaccine information, perceived vaccine) and previous vaccine experience affect vaccine uptake (MacDonald, 2015; Murphy et al., 2021; Samarasekera, 2021).

Implementation issues influencing vaccination uptake in Africa are considered pervasive; for example, Nigeria has reportedly experienced a decline in COVID-19 vaccination uptake, according to Josiah and Kantaris (2021). Therefore, the choice of Nigeria as the location for this research study was substantiated as it is among the leading African countries associated with declining vaccination rates against vaccine-preventable diseases (see Josiah & Kantaris, 2021).

According to research, high vaccination rates in Nigeria depend on the population's demand for and willingness to take the vaccine, vaccine availability, and the supply of the COVID-19 vaccine (Nigeria Health Watch, 2021). The vaccine must be universally accepted for successful vaccine implementation and general population protection (Nigeria Health Watch, 2021). This study addressed the phenomenon of vaccine hesitancy through the HBM lens to further describe COVID-19 vaccine hesitancy among unvaccinated adults between the ages of 18 and 60 years in Nigerians.

Purpose of the Study

In this qualitative study, I explored the knowledge, attitudes, and hesitancy towards COVID-19 vaccination uptake in Nigeria. The study provides an understanding of the research phenomenon, contributes to the body of knowledge, bridges the public health gap, and generates findings that promote positive social change.

Research Questions

Research question (RQ)1: What is the relationship between COVID-19 knowledge and COVID-19 vaccine hesitancy among the unvaccinated population aged 18 to 60 years in Nigeria?

RQ2: What attitudes to COVID-19 vaccination can influence vaccine hesitancy among the unvaccinated population aged 18 to 60 years in Nigeria? RQ3: How do sociocultural (education, occupation, religion, beliefs, culture, ethnicity) factors influence COVID-19 vaccination hesitancy among the unvaccinated population between the ages of 18 to 60 years in Nigeria?

Theoretical Framework

The theory that grounded this study was the HBM. Hochbaum (1958) and Rosenstock (1960, 1974) are the theorists credited with developing the HBM. The HBM was developed to explain disease prevention behaviors (Becker & Maiman, 1975; Rosenstock, 1990). The HBM encompasses several core principles that predict why people would take action to prevent and screen for or control illness (Becker & Maiman, 1975; Rosenstock, 1990). Significant variables include perceived susceptibility and severity of a disease or condition, barriers and benefits to action, a cue to action, and general health motivation (Lauver, 1992). However, in the field of public health, the model has recently been extended or developed to include other components, such as perceived threat and self-efficacy (Metta, 2016).

According to the HBM, people with high perceptions of susceptibility to and severity of a disease or condition have a low barrier. They are likely to practice

preventive behavior when there is a high benefit, a cue to act, and a high incentive for health behavior (Lauver, 1992). The model's appropriateness is predicated on its use to research people's hesitance to participate in health intervention programs for disease detection and prevention (Hochbaum, 1958; Rosenstock, 1960, 1974). Also, the HBM can be used to predict health behaviors in adults across a variety of diseases and conditions (Janz & Becker, 1984; Painter et al., 2008; Rosenstock et al., 1994; Sherman et al., 2008), such as vaccination uptake (Brewer et al., 2007; Metta, 2016). People's reactions to symptoms (Kirscht, 1974) and behaviors in response to a confirmed illness, notably adherence to treatment regimens, can also be investigated using this approach (Becker, 1974).

The logical connection between the theoretical framework and the nature of my study is that the theoretical framework provided a basis for the study RQs and the appropriate methodology applicable to the theory. Furthermore, the study's theoretical assumptions provided an academic stand to answer the RQs. Further, the theoretical framework aided in developing a knowledgeable and specialized tool that I used to evaluate data, conduct data analysis, interpret findings, hold discussions, and make appropriate recommendations based on findings.

In Pollitt's (2010) evaluation of the field of public health, he concluded that various fields influence public health research; as such, public health is built on theoretical thinking, or what is known as a set of mini paradigms. Improving population health necessitates integrating research and intervention into several complementary disciplinary methods (Kivits et al., 2019). Grant and Osanloo (2014) stated that the RQ

bridges existing knowledge and the problem the study seeks to solve because the theoretical framework connects the existing information. Thus, the RQ is a distinguishable feature of the theoretical framework, articulating it in a way that allows further investigation.

The HBM aims to comprehend a wide range of factors that influence the design and execution of public health policies, such as improving public health through understanding (Abraham & Sheeran, 2015). The HBM also attempts to explain health-related behaviors, focusing on the role of social and psychological factors in influencing these behaviors (Kim & Kim, 2020). In addition, the HBM defines vital factors influencing health behaviors as an individual's perceived threat of sickness or disease (perceived susceptibility) and the belief of consequence (perceived severity). There are potential positive benefits of action (perceived benefits), perceived barriers to action, exposure to factors that prompt action (cues to action), and confidence in the ability to succeed (self-efficacy; Jones et al., 2015).

Furthermore, this theory is related to the research problem, the study's objective, the RQs, and the approach, given that this theoretical framework was developed to enhance public health by understanding why people failed to accept preventive health measures (see Carpenter, 2010). According to Kim and Kim (2020), in the HBM, people's commitment to health-promoting behavior is influenced by their beliefs, such as the benefits of healthy behaviors, barriers to engaging in them, and their level of self-efficacy. Because the HBM stresses cognitive factors, people's conduct is influenced by rational expectations.

Research has shown that some persons become more willing to adopt a "recommended activity" when they are convinced of the seriousness of the problem (epidemic), have a high susceptible risk, are confident of the benefits of the protective behavior, and incur minimal costs in adopting the preventive behavior (Durham et al., 2012; Park et al., 2010). Thus, the HBM helped explain the participants' perceptions of the study phenomenon. It also served as a foundation for developing realistic assumptions that could be evaluated and related to why unvaccinated Nigerians are hesitant to COVID-19 vaccination.

Nature of the Study

In this qualitative study, the research tradition I used to address the RQs was the interpretative phenomenological approach (IPA). Phenomenology is a type of inquiry that aims to describe the essence of a thing by looking at it through the viewpoint of individuals who have witnessed it. The goal of phenomenology is to explain the significance of the experience in terms of what happened and how it happened (Neubauer et al., 2019; Teherani et al., 2015). IPA examines study participants' opinions and interprets their interpretations of life events and experiences (Tanwir et al., 2021). In qualitative research, the interview is the most versatile technique. It is a way to learn about people's perspectives and thoughts. Thus, IPA is used when a RQ aims to comprehend a phenomenon (Tanwir et al., 2021).

I collected the qualitative data for the IPA by developing and using a semistructured interview questionnaire. As a country, Nigeria boasts 36 states in addition to the Federal Capital Territory. According to the census of 2006, Nigeria comprises over

250 multiple ethnic tribes with three prominent, namely Yoruba, Hausa, and Igbo. A precursor to collecting data from participants was to request and obtain ethical approval from the Institutional Review Board (IRB) of Walden University. I will save the collected data on a secured flash drive and a password-protected computer for 5 years per IRB guidelines. After 5 years, I will destroy the dataset through shredding and demagnetization as laid down by the university.

Definition

The *cause-and-effect relationship* relates to the effect of one variable leading to another event. That is, it explains the effect of one variable on the other variable. While one variable is the cause, it can have one or more effects. Here, knowledge and attitude could cause a person to be hesitant to COVID-19 vaccine.

Assumptions

In this phenomenological qualitative study, I assumed that enough research participants met this study's inclusion criterion – being hesitant against COVID-19 vaccination uptake in Nigeria. I assumed 10 to 16 research participants would be selected across the country. I also assumed they would voluntarily and willingly participate in this study. The research participants would share their lived experiences on why they remain unvaccinated against COVID-19. I also assumed that the information the research participants shared would be enough to explore the study RQs that would fulfill the purpose of this study.

Scope and Delimitations

In this study, I sought to describe why some Nigerians are hesitant to receive COVID-19 vaccination. The study focused on the unvaccinated population between the ages of 18 and 60 years in Nigeria.

Limitations

A significant limitation associated with a qualitative study is validity and reliability. It is challenging to duplicate qualitative research because it occurs in a natural setting (Wiersma, 2000). The generalizability of a public health interpretative phenomenological finding is never certain because the IPA studies a person's, group's, or organization's behavior. This one unit of analysis may or may not mirror the knowledge and attitudes of similar entities. It may hint at what might be found in comparable communities, states, or countries, but more research is needed to confirm whether findings from one study can be replicated in others (Simon & Goes, 2013).

Regarding measurements and testing, the research instrument could be limiting because it produces limited results. Another element that can limit a study by altering the results is time. For example, depending on the time of year data are collected, a study on food habits may be the element that limits the results' scope. Furthermore, more extensive sociological and financial changes that may occur during the research period should be mentioned (Hackshaw, 2008).

Another limitation is data analysis methods. Most qualitative approaches, for example, cannot be genuinely repeated or independently confirmed (Puhan et al., 2012). It can be challenging to conclude such studies because it is difficult to demonstrate a

cause-and-effect relationship. It is tough to generalize, primarily when only a few persons, groups, or organizations are investigated (Queiros, 2017). According to Rahman (2017), a smaller sample size in terms of research method raises the question of generalizability to the entire population of the study.

The interpretation and analysis of the data may thus be more difficult (Richards & Richards, 1994). Qualitative research is a complex and lengthy process, with rigorous requirements for analysis on one side and elusive data on the other (Berg & Lune, 2012). Darlington and Scott (2003) argued that the difficulty of turning an undeveloped question into a researchable form is more complicated in qualitative research, as the refining question can be persistent throughout the study, in addition to the difficulty of data interpretation and analysis. The results of qualitative analysis can only be loosely generalized to a broad population because they take a long time to complete (Flick, 2011). The social and cultural backgrounds of the studied variables may be ignored in qualitative research (Richards & Richards, 1994).

I recruited study participants who were vaccine-hesitant. I selected participants who were willing to reveal information about their families. I asked about their family's vaccination history or what influenced their decision to accept or not the COVID-19 vaccine. A limitation might have occurred where religious and cultural reasons may have prevented the participants from discussing family decisions during the interview. I assured the participants that their information would be confidential, there would be no sharing or use for any purpose other than the study, and their privacy would be respected.

Another predicted problem was that potential participants may have needed more time for the study because they worked and cared for their families. Such activities may have become jeopardized. To resolve time conflicts, I encouraged participants to choose their preferred day, time, and location and was flexible to work with their scheduled times. Also, data validation could have presented a challenge. However, I developed a range of strategies to guarantee the trustworthiness of the data and research findings. I double-checked my data throughout the collection and analysis process by comparing them to my field notes and journal entries.

Furthermore, questions were written clearly in a few words and presented in simple terms. Viable responses were checked for accuracy against the study topic, allowing participants to respond efficiently. I evaluated my thoughts and beliefs on the studied phenomenon and clarified my conscience to rule out bias that might have influenced the study's outcome.

Significance

This study is significant in that it explored the phenomenon of vaccine hesitancy through the HBM lens to describe further the knowledge, attitude, and hesitancy towards the COVID-19 vaccine among unvaccinated adults between the ages of 18 and 60 years in Nigeria. The context-specific factors were the issues that influenced COVID-19 vaccination hesitance among adults in Nigeria and adopted methods to attain high coverage rates. As a result, the study's findings and recommendations may inform public health policymakers to understand better the knowledge, attitudes, and behaviors to

COVID-19 vaccine hesitancy among unvaccinated adults between the ages of 18 to 60 years in Nigeria.

Furthermore, the study's findings may contribute to elements of more effective vaccine strategies that can boost COVID-19 vaccination uptake in Nigeria, resulting in positive societal change. In this study, I compared other studies on COVID-19 vaccination uptake in sub-Saharan Africa to serve as a reference point for future COVID-19 researchers interested in vaccine hesitancy in Nigeria.

Summary

Research has shown countries worldwide adopting vaccines as a measure of disease prevention. In the preceding discussion, I addressed the efficacy of vaccines in reducing and inhibiting preventable diseases due to the herd immunity produced over time in populations. Even though COVID-19 vaccination is rated successful, some individuals, groups, or populations have remained hesitant to receive this vaccine, notwithstanding the high mortality rate and complications associated with coronavirus disease. Resisting vaccination amidst emergent diseases has led to hesitancy, now considered a significant global health issue (Cascini et al., 2021; Iliyasu et al., 2021).

This qualitative study using the HBM theoretical framework and the IPA provided a platform and method for a better understanding why there is a lack of knowledge and negative attitudes in the unvaccinated target population between the ages of 18 to 60 years in Nigeria. I hope to generate findings and recommendations that can inform Nigerian public health policymakers in developing effective vaccine strategies to boost COVID-19 vaccination uptake in Nigeria, promoting positive change in society.

Chapter 2: Literature Review

Introduction

In this qualitative study, I sought to know why some Nigerians are hesitant to COVID-19 vaccination. Within this context, I explored the knowledge and attitudes of unvaccinated Nigerians toward hesitancy to COVID-19 vaccination uptake in Nigeria. Nigeria started administering COVID-19 vaccinations on March 5, 2021 (Adedeji-Adenola et al., 2022). As of July 25, 2022, 27.23 doses have been given per 100 population (WHO, 2022). Even though most respondents had heard of COVID-19 vaccinations via social media, only 20% of respondents consulted official websites for COVID-19 vaccine information, reflecting the public's declining trust in the government (Tobin et al., 2021). In Nigeria, as of July 25, 2022, 56,126,494 vaccine doses had been administered; a breakdown showed 36,549,506 persons had received the initial dose while 24,675,659 people received the three recommended doses (WHO, 2022). The acceptance of the COVID-19 vaccine reflects community perceptions of COVID-19's risk and the vaccine demand (Adetayo et al., 2021).

Nigeria has a high risk of coronavirus importation, an increased vulnerability, and an average capacity to control the outbreak (Gilbert et al., 2020). Nigeria has documented 255,836 confirmed COVID-19 cases and 3,143 COVID-19 deaths out of 8,877,980 COVID-19 confirmed cases and 171,954 confirmed COVID-19 deaths on the African continent (WHO, 2022). Even though Nigerians have a good knowledge of COVID-19 and the vaccine, more than half are not willing to accept the vaccine (Josiah & Kantaris, 2021), contributing to the increasing COVID-19-related mortality. Thus, COVID-19

vaccination hesitancy poses a hazard to individual, personal, and national health because it postpones the development of herd immunity for the disease (Afolabi & Ilesanmi, 2021).

According to Razai et al. (2021a), COVID-19 vaccine hesitancy is affected by factors including complacency, convenience, confidence, sociodemographic settings, and complex, context-specific variables that vary with time and place. Various factors, including ethnicity, culture, religion, and other sociodemographic factors in Nigeria, influence COVID-19 vaccination coverage rates. Disparities are also visible when comparing rates depending on literacy levels, family wealth index, and caretaker age (NBS, 2018). Meanwhile, public distrust of the government and the international community's intentions, political and religious divisions, and a lack of community engagement can sabotage a vaccination program (such as COVID-19) meant for the public good, with disastrous results (Jegede, 2007).

In this Chapter, I present the literature search strategy and keywords used to search for the literature under review. I briefly discuss the theoretical framework of the HBM upon which the study was grounded. I discuss the literature searched under the following headings: an overview of COVID-19, COVID-19 vaccination uptake, and COVID-19 vaccine hesitancy. Further literature discussions focus on the knowledge of COVID-19 vaccination uptake, attitude towards COVID-19 vaccination uptake, barriers to COVID-19 vaccination uptake, facilitators of COVID-19 vaccination uptake, strategies for addressing COVID-19 vaccine hesitancy in Nigeria, and cross-country empirical evidence.

Literature Search Strategy

In searching and reviewing literature for this Chapter, I accessed library databases and search engines such as Google Scholar, Elsevier, PubMed, Taylor & Francis, EBSCO, ProQuest Central, and SAGE Premiere. The key search terms included *COVID-19, COVID-19 knowledge, COVID-19 attitude, COVID-19 vaccination uptake, hesitancy to COVID-19, resistance to COVID-19, women,* and *COVID-19, COVID-19 in Nigeria.* The combination of the search terms used was *COVID-19; knowledge and COVID-19; attitude and COVID-19; hesitance and COVID-19; COVID-19 vaccination uptake; COVID-19 and COVID-19 vaccination uptake; women and COVID-19; women and COVID-19 vaccination uptake; women, knowledge, attitude, and hesitance to COVID-19 vaccination uptake; women and resistance to COVID-19 vaccination uptake; hesitance, knowledge, attitude, and COVID-19 vaccination uptake, resistance, and COVID-19 vaccination uptake; Nigeria and COVID-19; Nigeria and COVID-19 vaccination uptake;* and *the barriers and facilitators of COVID-19 vaccination uptake in Nigeria*. An extensive list of literature related to the study was compiled by applying combined keywords as search engines for the academic literature mentioned above. Most of the literature searches were allocated to research published within the last 3 years in peer-reviewed journals, books, government nongovernmental, and reports by international organizations.

Theoretical Foundation

This study was grounded on the HBM. The HBM was developed by Hochbaum et al. in the early 1950s (as cited in Cummings et al., 1978; Janz & Becker, 1984). The

HBM model was developed in reaction to the failure of a free tuberculosis (TB) health screening program. The TB screening program offered free X-rays to individuals at mobile terminals conveniently positioned around different neighborhoods. When the program's administrators observed that few people used the free TB screening x-ray services, they investigated the causes for their failure to use it. Hochbaum investigated what motivated those who used the free service (as cited in Janz & Becker, 1984).

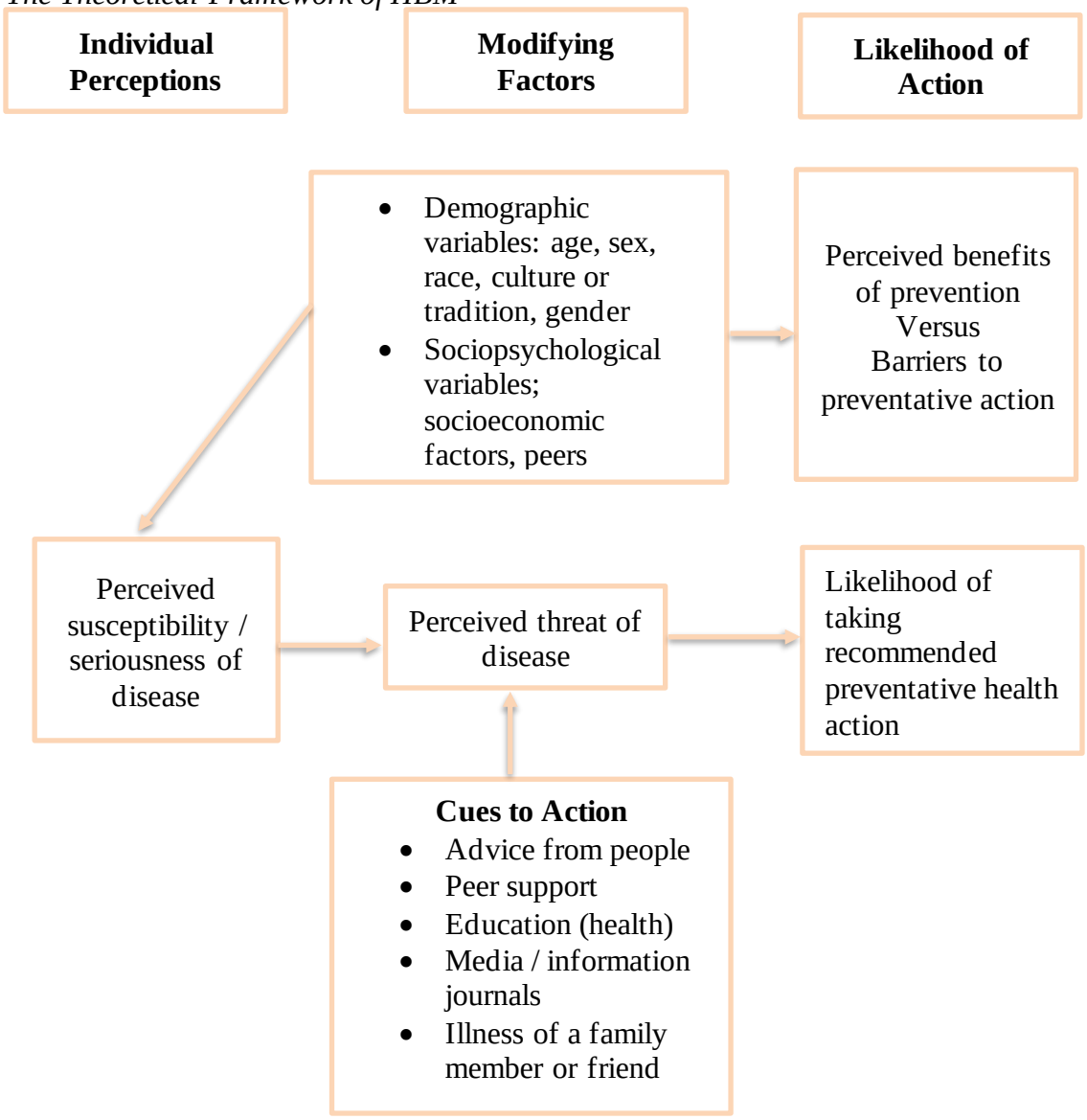
According to the HBM, a person's knowledge of a health concern and understanding that undesired consequences are prevented or reduced determines their health behavior (Weld et al., 2008). The HBM's central concept tries to explain and anticipate health behaviors to avoid a disease condition (Jones & Bartlett, 2010). The HBM's central tenet is that people will take action if they believe their health is in danger and that taking action to improve their health would be preferable to doing nothing. The presumption aligns with the model's emphasis on illness prevention and health promotion (Pender et al., 2011). Helping people understand their ability to prevent an illness is essential, and this is only possible when they have the requisite skills, supportive environment, and knowledge of the disease. Then, one would take preventative measures after coming to such a realization (Tarkang & Zotor, 2015).

The HBM consists of six components; the first four are known as the original HBM beliefs, and the final two are more closely associated with the development of HBM research. The six elements are perceived susceptibility, perceived severity, perceived benefits, perceived barriers (Janz & Becker, 1984), cues to action, and self-efficacy (Clarke et al., 2000; Glanz et al., 2002). A more recent addition, self-efficacy,

was taken directly from Bandura's (2007) work. It, along with cues to action, are later additions that explain occasions or encounters that prompt a person's immediate desire to act (Tarkang & Zotor, 2015). Figure 1 illustrates the HBM.

Figure 1

The Theoretical Framework of HBM



Note. Janz and Becker (1984). The health belief model: A decade later. *Health Education Quarterly, 11*(1), 1-47

The HBM theory presupposes that a person will act in a preventive manner if they believe that a harmful health condition can be prevented by following a recommendation (Tarkang & Zotor, 2015). The person must understand the advantages of engaging in certain behaviors, including receiving a COVID-19 vaccine. It would be challenging to take the required step if one cannot see any benefits. People must, therefore, receive COVID-19 vaccinations to avoid contracting the disease or suffering from its adverse effects. The HBM is a value expectancy theory with two values: the desire to stay healthy or to prevent disease. The conviction is that specific health interventions a person could take would help them avoid adverse outcomes (Onega et al., 2000). According to the HBM, a person's propensity to adopt a behavior can be predicted by how much they think they risk getting sick or having a disease and how much they think the prescribed health action is worth doing (Tarkang & Zotor, 2015). In the context of this study, avoiding COVID-19 disease would be the goal, receiving COVID-19 vaccination would be the specific health intervention, and COVID-19 disease would be the unfavorable outcome.

Perceived Susceptibility

Perceived susceptibility is a person's perception of susceptibility to a specific disease (Groenewold et al., 2006). According to scholars, people are more inclined to take preventive measures when they perceive a health condition as personally significant. Therefore, activities that heighten a person's awareness of their sensitivity to the illness, such as COVID-19, are necessary to achieve (Tarkang & Zotor, 2015). This implies that people who think they are COVID-19 susceptible are more likely to receive the COVID-19 vaccination to vaccinate and protect them against the disease.

Perceived Severity

Perceived severity refers to one's perceptions of the seriousness of a condition and its repercussions (Groenewold et al., 2006). Realizing one's vulnerability to a problem or condition may not motivate one to take the necessary preventative steps, mainly if one is unaware that contracting an illness will adversely affect one's health and social standing. When a person is aware of the severity of a condition's harmful effects, they are better able to take the required steps to mitigate them. Perceived severity also refers to assessing a disease's danger if left untreated, the risk of exposure an individual feels over how quickly they could contract a disease, or the danger of leaving it untreated (Wagle, 2022).

In determining severity, an individual's emotional state varies, and, frequently, they consider both the health consequences (such as morbidity and mortality, disability, and pain) and social implications (such as the effect of COVID-19 on family life, work, and social relations; Janz & Becker, 1984). In this sense, the perceived severity refers to one's perceptions of the severity of COVID-19 and its repercussions on the person's health. It further states that people must regard COVID-19 as a severe disease with substantial effects and consequences on their bodily and social lives (such as morbidity, disability, and mortality) before they will be encouraged to adopt appropriate preventative measures against COVID-19 disease.

Perceived Benefits

Perceived benefits refer to one's perceptions of the effectiveness of the recommended action to lessen the risk or the severity of an impact. The person must believe that by taking action, they may prevent or avoid a problem. This conviction gives

the person the confidence to act because of the predicted outcomes. It speaks of the perceived value of the action to improve one's health. A person's course of action to prevent (or treat) sickness depends on thought, evaluation of one another's evaluated susceptibility, and perception of advantage; for example, if the COVID-19 vaccination uptake is considered favorable, a person would choose that course of action (Wagle, 2022).

Thus, the HBM suggests that belief in the efficiency of COVID-19 vaccination uptake to prevent COVID-19 disease should positively correlate with individuals' vaccination rates. Essential psycho-social elements influence people's willingness to accept COVID-19 vaccinations. Perceived benefits are opinions on the efficacy of advised preventative health measures, such as receiving the COVID-19 vaccine to prevent COVID-19.

Perceived Barriers

Perceived barriers refer to the conviction of the physical and psychological consequences of the suggested behaviors (Groenewold et al., 2006). There may be several obstacles that influence people's choices of actions. Perceived barriers are perceived obstacles to action, like getting vaccinated against COVID-19. This refers to a person's perspective on the risks of receiving the COVID-19 vaccine. A cost/benefit analysis is necessary due to the vast difference between a person's mental state and obstacles or diseases (Wagle, 2022). The person assesses the initiatives' effectiveness in contrast to beliefs that they might be costly, dangerous (for example, side effects,

iatrogenic outcomes), unpleasant (for example, painful, challenging, upsetting), inconvenient, time-consuming, or untimely death (Janz & Becker, 1984).

The perceived barriers to preventative behaviors may include costs, difficulties, unpleasantness, phobic reactions, accessibility issues, psychological and physical impediments, and personality attributes (Agha et al., 2001; Rosenstock et al., 1988). Costs, duration, the difficulty of the required behaviors, and availability of resources enabling initiating and maintaining the necessary activities are further perceived barriers. People can only take the necessary actions once they recognize they can overcome these obstacles (Polit & Hungler, 1999).

Cues to Action

Cues to action are incidents or encounters that are either personal (physical signs of a health condition), interpersonal, or environmental (media attention), such as the decision to receive the COVID-19 vaccine (Groenewold et al., 2006). When someone feels the want to act after believing they can do so, they are said to be in a cue to active state. Cues to action are the motivators required to start the decision-making process and accept an advised action for health, such as COVID-19 vaccination uptake. These reminders may come from within (such as chest aches, wheezing, coughing, or a cold) or from the outside (e.g., advice from others, illness of a family member, newspaper article, among others).

Events occurring in the environment and within the individual can cause behavior to alter (Wagle, 2022). One can take the necessary actions or treatments by understanding how to overcome the anticipated obstacles. It takes the individual's motivation to follow

through with the advised course of action or treatments, to be concerned about their health, to seek out and receive medical care, and to engage in healthy behaviors (Polit & Hungler, 1999).

Self-Efficacy

Self-efficacy is the degree to which a person feels confidence in their ability to respond to new diseases and overcome any obstacles or setbacks. Self-efficacy is the capacity to act successfully, such as receiving a COVID-19 vaccination. Self-efficacy is the belief in one's capacity for action, such as the uptake of the COVID-19 vaccine. It increases the bar for someone's trust in their ability to utilize behavior constructively—the confidence in their ability to engage in the behavior required to get the intended effects. One should be confident to take the necessary activity appropriately because doing so will drive them to start and continue the action. Self-efficacy is the belief in one's capacity to respond to the COVID-19 vaccine (Clarke et al., 2000; Groenewold et al., 2006).

This model's rationale is appropriate for its use to research people's resistance to participating in health intervention programs for disease detection or prevention (Hochbaum, 1958; Janz & Becker, 1984; Rosenstock, 1960, 1974). Also, the HBM can be used to predict health behaviors in adults across a variety of diseases and conditions (Janz & Becker, 1984; Painter et al., 2008; Rosenstock et al., 1994; Sherman et al., 2008), such as vaccination uptake (Brewer et al., 2007; Metta, 2016). People's reactions to symptoms (Kirscht, 1974) and behaviors in response to a confirmed illness, notably

adherence to treatment regimens, can also be investigated using this approach (Becker, 1974).

Thus, the theoretical framework established a link between the nature of the study and previous knowledge. It provides a basis for the study RQs and the appropriate methodology applicable to the theory. Furthermore, the study's theoretical assumptions make it easier to answer the RQs. It, in turn, aids in developing a knowledgeable and specialized lens through which I evaluate the data, conduct data analysis, interpret findings, discuss them, and make recommendations based on the findings.

Research studies, therefore, have shown that public health research is linked to a variety of theoretical frameworks or what is known as a set of mini paradigms (Pollitt, 2010). As a result, improving population health necessitates integrating research and intervention into several complementary disciplinary methods (Kivits et al., 2019). Grant and Osanloo (2014) state that the RQ bridges existing knowledge and the problem the study seeks to solve since the theoretical framework connects the existing information. Thus, the RQ is a distinguishable feature of the theoretical framework, articulating it in a way that allows further investigation.

The study, therefore, was based on the theoretical framework of HBM. This model describes the research problem and why it exists based on these considerations: the research problem, the purpose of the investigation, and the RQs. This model, credited to Hochbaum (1958) and Rosenstock (1960, 1974), is one of the most utilized models in public health research to analyze how public health policies are implemented (Metta, 2016). The HBM aims to comprehend a wide range of factors that influence the design

and execution of public health policies, such as improving public health by understanding (Abraham & Sheeran, 2015).

Furthermore, this model is related to the research problem, the study's objective, the RQs, and the study approach, given that this theoretical framework is applied to enhance public health by understanding why people fail to accept preventive health measures (Carpenter, 2010). According to Kim and Kim (2020), in the HBM, people's commitment to health-promoting behaviors is influenced by their beliefs about the benefits of healthy habits, barriers to adoption, and levels of self-efficacy.

The HBM emphasizes cognitive aspects because logical expectations can easily affect people's behavior. When people are convinced of the severity of the epidemic, think they are particularly susceptible to it, are confident that a protective behavior is good, and think adopting the recommended behavior will only cost them a small amount of money, they are more likely to do it (Durham et al., 2012; Park et al., 2010). Thus, the HBM provides the basis to explain the participants' perceptions of the study phenomenon. It also served as a foundation for developing realistic assumptions that can be evaluated and related to why the Nigerian population remained unvaccinated or hesitant to COVID-19 vaccination.

Literature Review

Overview of COVID-19

The deadly COVID-19 was initially discovered in December 2019 in the Chinese province of Wuhan (Huang, J. et al., 2020; Paules et al., 2020; Michael et al., 2021), and it has since spread around the world and become a severe public health risk (Pal et al.,

2020; Malik et al., 2020; Wang et al., 2020a). COVID-19, known for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), causes pneumonia, severe respiratory sickness, and death (Zhou et al., 2020). The deadly COVID-19 is still pervasive (Islam et al., 2021).

The WHO pronounced COVID-19 a global pandemic on March 11, 2020 (Cucinotta & Vanelli, 2020; Islam et al., 2021; Michael et al., 2021; WHO, 2020b; 2021), and a public health emergency of international concern on January 30, 2020 (WHO, 2020a). The severe acute respiratory syndrome coronavirus-2, which causes COVID-19, causes asymptomatic infection, fatal pneumonia, and severe respiratory disease (Zhou et al., 2020). As of April 2021, the COVID-19 epidemic has damaged several countries' economies and health nearly unimaginably (Adetayo et al., 2021). The virus infected people of various ethnicities, races, and demographics (Michael et al., 2021; Moses et al., 2020; Pan et al., 2020; Ro, 2020). Thus, correct COVID-19 methods and adequate health understanding are necessary to control the disease's spread (Adesegun et al., 2020; Yu & Keralis, 2020; Zhang et al., 2020).

Nigeria reported her first COVID-19 case on February 18, 2020 (Ogiona, 2020). Nigeria's federal government imposed a national lockdown on March 30, 2020, to stop the spread of the disease, especially in three high-risk states: Lagos, Abuja, and Ogun. As a result, numerous Nigerian state governments enforced lockdowns in their regions, resulting in a nationwide lockdown by March 2020 (Akintan & Babatunde, 2022; Emenena & Atuahene, 2021; Oyewumi & Adebowale, 2021). Due to a decline in

COVID-19 infections (below 200 new daily cases nationwide), the lockdown was lifted on July 27, 2020 (Adesegun et al., 2020; Michael et al., 2021; NCDC, 2020a).

Nigeria has a high risk of coronavirus importation, a high vulnerability, and an average capacity to control the outbreak (Gilbert et al., 2020). On July 25, 2022, 6,376,503 confirmed COVID-19-related deaths, 566,977,818 confirmed cases, and 387,629 new cases in the last 24 hours (WHO, 2022). As of May 13, 2022, there had been 8,877,980 COVID-19 confirmed cases and 171 954 confirmed COVID-19 deaths on the African continent, and 255,836 COVID-19 confirmed cases and 3,143 COVID-19 deaths in Nigeria (WHO, 2022).

COVID-19 Vaccination Uptake

Scholars have argued that protection measures are crucial for pandemic management and that vaccination is an efficient and economic COVID-19 protection strategy (Lurie et al., 2020; Yang et al., 2020). This global public health emergency has accelerated attempts to develop and approve vaccinations (Lurie et al., 2020). AstraZeneca, Pfizer- BioNTech, Moderna, and Johnson & Johnson (Janssen) are just a few of the companies that have manufactured preventive vaccinations against COVID-19 that have already been distributed to various countries (Adetayo et al., 2021). Through the COVID-19 Vaccines Global Access (COVAX) project, many African nations, including Nigeria, got the initial shipment of vaccines in early March of 2021 (Iliyasu et al., 2021; Nachega et al., 2021).

The WHO (2022) reported that as of July 25, 2022, 12,219,375,500 vaccine doses had been administered; 5,302,262,370 people had received at least one dose, and

4,842,456,872 people had received all recommended doses globally (WHO, 2022). Also, in Nigeria, as of July 25, 2022, 56,126,494 vaccine doses had been administered, with 36,549,506 people receiving at least one dose and 24,675,659 people receiving all three doses (WHO, 2022). Nigeria started administering COVID-19 vaccinations on May 5, 2021, and as of July 25, 2022, 27.23 doses had been given per 100 population.

The effort to find a COVID-19 vaccine to stop the disease's spread and disastrous effects is still ongoing (Islam et al., 2021; Wibawa, 2021), and as the pandemic spreads, more potent vaccines may emerge (Islam et al., 2021). Thus, according to Adetayo et al. (2021), COVID-19 vaccine acceptance reflects community perceptions of COVID-19's risk and the vaccine demand. The vaccination programs need to succeed in reaching high vaccination coverage rates. Unfortunately, refusal would expose more people to the disease; such information aids appropriate authorities in making educated forecasts regarding vaccine adoption and developing initiatives for boosting acceptance.

COVID-19 Vaccine Hesitancy

The WHO described vaccine hesitancy as delaying or outright rejecting vaccinations, an alarming issue in global public health (Afolabi & Ilesanmi, 2021; Razai et al., 2021a). For instance, the root cause of the recent measles outbreak in New York City in 2019 was partially traced to vaccine hesitancy. Per assumption, many adolescents in a particular community in New York did not receive their recommended vaccinations due to false information that vaccines have adverse effects such as autism (Allen & Cherelus, 2019). Also, several incidents and rumors have questioned the effectiveness and success of COVID-19 vaccination initiatives in Africa. Between 2002 and 2006, the

incidence of polio in Nigeria increased by five times, and polio outbreaks increased on three non-African continents due to the 2003–2004 vaccine refusal, which was motivated by mistrust and falsehoods (United Children Education Fund [UNICEF], 2020).

Thus, Sato and Fintan (2020) defined COVID-19 vaccine hesitancy as the delay in accepting or refusing COVID-19 vaccines despite the availability of vaccination services. The phrase "COVID-19 vaccine hesitancy" is used to characterize a range of attitudes and behaviors over whether to accept the vaccination, from outright denial to full acceptance, according to Beleche et al. (2021). People hesitant about getting vaccinated may delay or alter prescribed vaccination schedules, only get vaccinated partially, or refuse to vaccinate (McClure et al., 2018).

In addition to COVID-19, vaccine hesitancy impacts preexisting medical issues – vaccination is essential for reducing associated sickness and deaths. As a result, refusing vaccination can affect how quickly an outbreak can be contained (Beleche et al., 2021). Full or partial hesitancy to COVID-19 vaccination uptake delays or affects herds' immunity, a sole effective measure to fight the pandemic or to contain the disease outbreak.

COVID-19 vaccine hesitancy is a global issue with several underlying causes (Palamenghi et al., 2020; Sun et al., 2021). False or contradictory information is a crucial obstacle to community-wide acceptance of COVID-19 vaccination (Adetayo et al., 2021). Sociodemographic factors (such as sex, age, education, income, and occupation) (Khubchandani et al., 2021; Lazarus et al., 2021; Murphy et al., 2021; Sallam, 2021) and health-related factors (such as risk perception, severity, knowing someone who has

COVID-19, having co-morbidities), as well as vaccine-related knowledge (vaccine confidence, source of information, perceived vaccine), according to MacDonald (2015) are directly related to vaccine hesitancy. Further, preexisting medical conditions influence COVID-19 vaccine hesitancy (MacDonald, 2015; Murphy et al., 2021; Samarasekera, 2021).

According to Razai et al. (2021a), COVID-19 vaccine hesitancy is affected by factors including complacency, convenience, confidence, and sociodemographic settings. These complex, context-specific variables vary with time and place (Larson et al., 2014). The propagation of false information and conspiracy theories on social media, an accessible and widely used channel, may also contribute to vaccine hesitancy (Duffy et al., 2020; Mills et al., 2020). Structural variables contribute to low trust and low uptake of COVID-19 vaccination, including health inequities, socioeconomic disadvantages, systemic racism, and access restrictions (Razai et al., 2021a; Razai et al., 2021b). Razai et al. (2021a) argued that vaccine hesitancy might not accurately describe broader factors affecting people's decisions to postpone or decline COVID-19 vaccination.

According to scholars, misinformation and rumors on social media encourage vaccine hesitancy and refusal (Islam et al., 2021; Puri et al., 2020; Simas & Larson, 2021). For instance, Islam et al. (2021) revealed that 89 percent of participants believed that the COVID-19 vaccination could have some adverse effects, similar to the findings of a study in the United States (Callaghan et al., 2020). Bianco et al. (2019) reported that beliefs that a specific illness cannot be prevented by vaccination and disinformation on social media are both factors in vaccine hesitancy and resistance. According to a study

conducted in China, 48% of participants deferred vaccination before the vaccine's validation as safe (Wang et al., 2020b). Also, the rapid pace of vaccine development and the distrust of some scientific and medical authorities may increase concern regarding the COVID-19 vaccine (Islam et al., 2021; Chou & Budenz, 2020).

Afolabi and Ilesanmi (2021) asserted that a cause-and-effect model might be used to analyze the factors contributing to COVID-19 vaccination hesitancy. For instance, public health specialists and many governments in African nations were accused of delaying their policy reactions to the COVID-19 outbreak, leading to public mistrust. There was laxity in applying border restrictions in Nigeria before the index case of COVID-19 in Africa on February 14, 2020. African political leaders ensured their relatives left COVID-19 high-risk nations like China, Germany, and the United States for Africa during this time.

Prejudice has been a big challenge, COVID-19 was imported into Africa, endangering the general population's health, which people on the African continent did not appreciate. Community involvement was also missing while COVID-19 control measures such as social withdrawal, hand washing, and others were introduced (Afolabi & Ilesanmi, 2021; Duru et al., 2020). Furthermore, African governments did little or nothing to refute social media claims and traditional media that the African continent's climate rendered immunity to COVID-19. Thus, many Africans were disappointed in their governments when COVID-19 cases were reported (Afolabi & Ilesanmi, 2021).

In Nigeria, COVID-19 vaccination coverage rates are influenced by various factors, including ethnicity, culture, religion, and other sociodemographic factors.

Disparities are also visible when comparing rates depending on literacy levels, family wealth index, and caretaker age (NBS, 2018). Meanwhile, public distrust of government and the international community's intentions, political and religious divisions, and a lack of community engagement can sabotage a vaccination program (such as COVID-19) meant for the public good, with disastrous results (Jegede, 2007).

Thus, COVID-19 vaccination hesitancy exposed more people to infectious diseases and the advancement of sickness among those already ill. As a result, COVID-19 vaccination hesitancy poses a hazard to individual, personal, and global health since it postpones the development of herd immunity for the disease (Afolabi & Ilesanmi, 2021). COVID-19 herd immunity is complex in many countries, including Nigeria, due to vaccine hesitancy, projected at 67 percent (Randolph & Barreiro, 2020). Thus, the WHO suggests a proactive approach to reduce COVID-19 vaccination hesitancy and boost vaccine confidence (Adetayo et al., 2021; French et al., 2020).

A body of evidence has shown that factors such as socio-demographics (for example, sex, age, education, income, and occupation) and health-related problems (for example, risk perception, severity, knowing someone who had COVID-19, having co-morbidities) act as a barrier to vaccination. There is reported that other vaccine-related issues (such as vaccine trust, source of information about vaccines, perceived vaccine efficacy, safety, and adverse effects) all affect vaccine hesitancy (Lazarus et al., 2021; Murphy et al., 2021; Sallam, 2021; Samarasekera, 2021).

Also, political variables are significant determinants of vaccine hesitation, including faith in vaccine developers, the vaccine approval procedure, the vaccine

country of origin, and recommendations (Kreps et al., 2020; Tobin et al., 2021). Inaccurate information and anti-vaccine campaigns, particularly on social media, unfavorable attitudes of the pharmaceutical business, and doubts about the validity or source of vaccinations are other significant factors contributing to vaccine hesitancy (Germani & Biller-Andorno, 2021; Wilson & Wiysonge, 2020). In addition, reports of mistrust, negative news, and a sense of invincibility are contributory factors to vaccine hesitancy (Daly et al., 2021; Iliyasu et al., 2021; Samarasekera, 2021).

Knowledge of COVID-19 Vaccination Uptake

Researchers have reported that several platforms are available and accessible to people for acquiring more knowledge on the COVID-19 vaccine and vaccination uptake. Researchers, including Tobin et al. (2021), discovered that most respondents had heard of COVID-19 vaccinations via social media. Only 20% of respondents consulted official websites for COVID-19 vaccine information, which reflects the public's declining trust in the government. Also, vaccine production arguments, including conspiracy theories, are another source of COVID-19 vaccination information.

Islam et al. (2021) discovered that the participants' primary sources of knowledge on the COVID-19 vaccine were the internet, social media, and mass media. Other scholars, including Lau et al. (2020), Odeyemi et al. (2021), Reuben et al. (2020), and Zhong et al. (2020) reported that social media and the internet were the primary tools for educating different demographic segments about the COVID-19 pandemic during its rapid spread in Nigeria. Thus, participants are used to social media and the internet to acquire more knowledge on COVID-19.

Also, there is a significant association between socioeconomic factors and knowledge of COVID-19 vaccination uptake. According to Islam et al. (2021), the mean knowledge score was significantly higher among participants who reported having university or higher levels of education, close-knit families, higher income or upper socioeconomic status (SES), living in urban areas, and previous vaccination history.

Knowledge of the COVID-19 vaccine was significantly associated with education, family type, and monthly income (Adigun & Adeniyi, 2023; Ajayi et al., 2023). Furthermore, Islam et al. (2021) found that the higher SES population had more information about COVID-19 vaccinations than the lower SES group. Research indicates that individuals who had previously had any immunization knew more about COVID-19 vaccinations and that those who lived in urban areas knew much more about COVID-19 vaccinations than those who did not (Adeyemi et al., 2021; Ogunbode et al., 2023).

Also, no significant connection between knowledge scores and participant sociodemographic features was observed (Adigun & Adeniyi, 2023; Ajayi et al., 2023). However, individuals with a single marital status scored lower on the COVID-19 knowledge scale than their married counterparts. It explains that single people are often more carefree than married people. They may be interested in learning more about the disease to protect their spouses, kids, and other close relatives (Miguel et al., 2020; Reuben et al., 2020; Zhong et al., 2020). Thus, during the pandemic, married people are more likely to surf the internet and explore social media to extract more information on COVID-19 to have more knowledge and understanding of the disease and its preventative

measures. They sought more knowledge on the disease to protect their families from contracting it.

In furtherance, Wang et al. (2020b) investigated the knowledge and acceptance of the COVID-19 vaccine in China; they discovered that those who had had an influenza vaccination were more likely to know more about and accept the COVID-19 vaccine. According to Ojewale et al. (2022), participants who gave themselves better scores for their knowledge of COVID-19 were less likely to be concerned about the vaccine being used for profit. It is plausible as individuals may have searched for information on the disease and related vaccines and become convinced of the vaccine maker's trustworthiness.

Attitude Towards COVID-19 Vaccination Uptake

Evidence revealed that income and education influence people's attitudes towards COVID-19 vaccination uptake. Michael et al. (2021) reported that participants who gave the government's response to the pandemic a high rating were more inclined to consider the COVID-19 vaccination favorably. Furthermore, participants with various assets were more likely to be optimistic about the value of vaccinations (Michael et al., 2021). Participants who lived in large homes were more likely to have a favorable attitude about the COVID-19 vaccine against concerns of unanticipated long-term consequences (Michael et al., 2021). However, those with formal education were less likely to do so. Living in a large house dramatically impacts one's attitude toward worries about capitalist gain. Participants who used poor hygienic waste disposal exhibited increased chances of

favoring COVID-19 vaccine uptake compared to those who preferred natural immunity (Michael et al., 2021).

Further, the number of rooms in the home indicated socioeconomic class, considered a generally favorable attribute toward vaccination uptake (Michael et al., 2021). Likewise, those with a good outlook and who held multiple assets were more inclined to believe in the benefits of vaccinations (Paul et al., 2021; Thunstrom et al., 2020; Ward et al., 2020). Williams et al. (2020) revealed that socioeconomic level was unrelated to older individuals' attitudes toward COVID-19 vaccination among UK residents. However, Ojewale et al. (2022) found that persons with lower socioeconomic status—those with fewer assets, lower incomes, and unclean waste disposal—frequently residing in urban slums—preferred the vaccine to their adaptive immunity. Less favorable attitudes toward the COVID-19 vaccine were observed in those who followed the COVID-19 preventive instructions more closely. Additionally, they valued acquired immunity over vaccination (Ojewale et al., 2022).

Researchers such as Ro and Ioannidis (2020) showed that individuals in high-income nations had a higher proportion of favorable attitudes about vaccine uptake. Since vaccinations are produced locally in certain nations, acceptance is associated with a higher level of trust in the vaccine (Ro & Ioannidis, 2020). Fear of side effects is another possible explanation for the low number of people with good sentiments toward the vaccine. Trust in the capacity of the government to handle the pandemic was a critical factor in having a favorable attitude toward the COVID-19 vaccination. The likelihood of receiving the vaccine was sixteen times higher among those who trusted the government

(Ro & Ioannidis, 2020). The influence of trust in medical professionals was significantly weaker than this component of trust in the government. Many believe the government is heavily involved in managing the pandemic (Ro & Ioannidis, 2020).

Regardless of race, people's attitudes toward vaccination and trust in the government seem similar (WHO, 2020d). Schernhammer et al. (2021) report that the negative attitude of Australians against the COVID-19 vaccine is influenced by their lack of trust in vaccinations, their fear of side effects, and their suspicion of the government and the vaccine as well as misinformation and mistrust of the vaccine itself. In the Portuguese population, multiple factors abound as to why the COVID-19 vaccines were not very popular (Silva et al., 2023). These include skepticism among young people (Martins et al., 2022), economic hardship caused by the pandemic (Goncalves & Santos, 2023), hesitancy to receive the COVID-19 vaccine (Pinho et al., 2021), a lack of trust in the COVID-19 vaccine (Oliveira & Duarte, 2022), and dissatisfaction with the health service's response to the pandemic (Costa & Ferreira, 2023).

Further, a better perception of government measures, consistent and contradictory information provided, and completing the questionnaire before releasing information on the pandemic were reported risk factors (Soares et al., 2021). Additionally, Park et al. (2021) revealed that South Korean citizens' attitudes toward the proposed COVID-19 vaccination were negatively impacted by their mistrust of the government.

Also, there are gender, religion, marital status, and occupational disparities in the uptake of COVID-19 vaccination. Williams et al. (2020) discovered gender variations in French vaccination attitudes, and Green et al. (2021) found the same result among Israelis.

However, participants in Nigeria's three primary religions—Christianity, Islam, and Traditional Religions—did not differ in their attitudes toward vaccination. Religion did not have as much of an impact on vaccine attitudes as ethnicity did (Ojewale et al., 2022). In contrast, Tobin et al. (2020) reported that Christians were less inclined than Muslims to embrace a vaccine due to the pervasive conspiracy notion that social media and respected religious leaders have supported. Research among Ugandans found that married people were more likely to obtain the vaccination than those who were not married (Echoru et al., 2021).

Additionally, unlike some Indian populations, the attitudes of professional and unskilled employees regarding commercial profiteering of the vaccine vary (Godasi et al., 2021). Self-employed respondents had significantly lower levels of vaccine acceptability, which could be related to the self-employed not having health insurance, which results in significant out-of-pocket medical expenses and the worry that the vaccine may not be accessible (Tobin et al., 2021).

Adding to this discussion, scholars such as Islam et al. (2021) discovered that participants who reported being female and receiving required vaccinations had considerably higher mean scores for attitudes. Thus, only sex and prior experience administering vaccinations were substantially associated with attitudes. Notably, most participants (78%) expressed favorable attitudes regarding the COVID-19 vaccination, and gender was strongly related to these attitudes (Islam et al., 2021). Wang et al. (2020b) believe that male participants in China were more inclined to receive the COVID-19 vaccine.

In a Polish study, males were more likely than females to accept a vaccine (Neumann-Bohme et al., 2020). In contrast, Malesza (2020) found that females were more likely to receive the COVID-19 vaccine than males. Thus, attitudes towards COVID-19 vaccination uptake were influenced or varied by gender. Women received COVID-19 vaccination than men to prevent their families from contracting the disease. Men receive the COVID-19 vaccine because they make more independent decisions concerning their health than women. Ethnicity impacted people's attitudes, connected to ethnic preferences in treating sick people, such as using herbs among the Yorubas in Nigeria (Adebowale et al., 2021). Preventative and treatment measures are primarily prevalent among married people caring for their families.

Scholars, however, ranked the factors influencing people's attitudes towards COVID-19 vaccination uptake. According to researchers, the respondents' top attitudes that prevent them from taking the COVID-19 vaccine include concerns about unintended consequences, a preference for natural immunity, widespread distrust of the benefits of vaccines, and worry about corporate profiteering (Adetayo et al., 2021). Factors influencing vaccine acceptance include general mistrust of expected health benefits, the safety of vaccines, concerns about unanticipated effects, and specific knowledge of vaccines that would affect the desire to vaccinate (Adetayo et al., 2021; Paul et al., 2021).

Healthcare professionals and the public may have been less eager to receive the vaccine due to mistrust of the government, the politics around vaccination, and the widespread internet fear of adverse side effects (Tobin et al., 2020). Concerns about the vaccination's safety, effectiveness, and adverse effects, as well as rumors about infertility,

are additional COVID-19 vaccine uptake factors (Iliyasu et al., 2021). Themes included skepticism regarding COVID-19's existence, distrust of authorities, and dependence on rumors and conspiracy theories (Iliyasu et al. (2021). Some people believe that public health officials and the government's trust are predictors of vaccine adoption, with higher government trust significantly increasing the chance of vaccination uptake (Padhi & Almohaithef, 2020).

People have low confidence or high mistrust of the COVID-19 vaccine's effectiveness, benefits, or safety (Larson et al., 2021). Since the vaccine is a novel innovation to treating the novel pandemic, people are worried about the negative consequences the vaccine might have on their health (Funk et al., 2023). Also, there are concerns that the COVID-19 disease was a hoax of the capitalist to achieve their objectives of more corporate profits through the vaccine (WHO, 2023).

Meanwhile, emerging findings revealed differing attitudinal preferences or reasons for COVID-19 vaccination uptake among age groups or ages. Tobin et al. (2021) reported that being an older adult determines COVID-19 vaccine acceptance, a finding supported by additional investigations (such as Detoc et al., 2020; Neumann-Bohme et al., 2020).

However, younger Saudi Arabians were reported by Magadmi and Kamel (2020) to be more receptive to the vaccination. While younger people may believe they are healthy and do not need vaccination yet are more likely to be asymptomatic carriers and spreaders, older adults have a higher risk of mortality following infection (Tobin et al., 2021). Older people received the COVID-19 vaccine to prevent the morbidity and mortality that the disease poses to their health and life. However, younger people are less

likely to receive the COVID-19 vaccine because they feel healthy with little or no symptoms of COVID-19-related morbidity.

There is evidence that reducing barriers and making vaccination simple can increase vaccine uptake, especially for most people who are not consciously choosing not to get vaccinated (WHO, 2020e). In the Iliyasu et al. (2021) study, most respondents indicated that they would consider getting the vaccination if given sufficient information; many individuals have been vaccinated without suffering adverse effects, and government officials followed suit.

Other factors that encourage vaccination uptake include advice from medical experts, traditional leaders, and religious figures. Additional strategies such as removing barriers (Brewer et al., 2017), using reminders (Harvey et al., 2015), using planning prompts (Milkman et al., 2011), and training and boosting the confidence of health workers (Brewer et al., 2017; Gagneur, 2020), are successful in promoting vaccination uptake (WHO, 2020e). Therefore, what may appear to be hesitation, resistance, or even rejection may be a reaction to the costs or inconveniences associated with vaccinating (WHO, 2020f). Addressing attitudinal factors constraining people from receiving the COVID-19 vaccine is imperative to increasing or motivating people to receive or increase COVID-19 vaccination uptake.

Barriers to COVID-19 Vaccination Uptake

Structural Barriers

Systemic problems or structural barriers may restrict an individual's access to vaccine services (Rebecca, 2021; WHO, 2023). The structure and funding procedures of

the healthcare system and the companies that support the healthcare system could be changed to address these hurdles (Rebecca, 2021; Agyemang-Boakye et al., 2022). The health system's administrative bureaucracy, including complex healthcare financing systems with elements like out-of-pocket expenses, public and private health insurance, etc., contributes substantially to COVID-19 vaccination uptake levels (Adebowale et al., 2021; Adeyemi et al., 2023). The distribution, location, and accessibility of public primary healthcare centers coordinating COVID-19 vaccination activities, particularly for urban and rural populations, significantly impact vaccine uptake (Ajayi et al., 2023; Ogunbode et al., 2023).

Other structural barriers affecting COVID-19 vaccination uptake include payment plans and prompt payment of the healthcare practitioners and community health, timely vaccine delivery to centers, and appointment systems or waiting times experienced by individuals seeking vaccination (Adefuye et al., 2022; Emenena & Atuahene, 2021).

Attitudinal Barriers

Attitudinal obstacles could make someone less likely to request or accept vaccination services. For instance, a recent Pew Research Center survey (2020) revealed that 39% of American adults planned not to receive the COVID-19 vaccine. Although it is encouraging that this percentage has declined over time. It is gravely alarming that 53% of these people would not change their opinions if given more knowledge about vaccines.

According to Rebecca (2021), a person is less likely to receive a vaccine protecting them from disease if they do not believe the disease prevented is severe; they

may even think it is a hoax. A person is far more likely to forego immunization if they believe that vaccines are harmful and are most likely a scheme to make money. People are less likely to heed the advice and receive vaccinations if they believe that the medical and government organizations engaged in vaccine distribution and recommendations are unreliable.

The abundance of conspiracy theories surrounding COVID-19, its origins, the steps taken or not taken to prevent its spread, and vaccines, in general, can support or introduce these opinions. In one survey, a third of the participants backed COVID-19 conspiracy claims (Earnshaw et al., 2020). These individuals were less likely to receive a vaccine even though it was free and widely available, demonstrating the influence of these beliefs (Earnshaw et al., 2020; Romer & Jamieson, 2020). Unfortunately, these opinions have not changed (Rebecca, 2021).

Trust Barrier

Vaccination uptake is substantially influenced by trust in the organizations responsible for vaccine production and delivery and their perceived competency. Furthermore, institutional mistrust is frequently not distributed equally among different subpopulations in a nation (Rebecca, 2021). According to academics, COVID-19 in the United States has also been associated with differential institutional mistrust. African Americans are more likely to mistrust the organizations responsible for vaccine production and delivery, which can significantly impact people's receipt of the COVID-19 vaccination (Freimuth et al., 2017; Jamison et al., 2019; Quinn et al., 2017).

The politics surrounding racial disparities in institutional mistrust are delicate. Their credibility has been weakened by past wrongdoing and ongoing discrimination against African Americans by the medical establishment and the American government. African Americans are less likely to desire to vaccinate against COVID-19 (Fisher et al., 2020; Malik et al., 2020; Reiter et al., 2020). Also, due to historical problems with unethical healthcare research, trust is crucial for Black communities with poor trust in healthcare organizations and research outcomes (Gamble, 1997).

Structured and institutionalized racism and prejudice can significantly erode trust in healthcare systems and public health initiatives, including vaccination programs (Bailey et al., 2021; Ford & Guillory, 2015). Historical underrepresentation or misrepresentation of minority ethnic groups in health research, particularly involving vaccine trials, can contribute to concerns about vaccine safety and efficacy within these communities (Jones et al., 2020; Williams & Cooper, 2016). It may also raise questions about whether vaccination research is ethnically diverse (Forster et al., 2016). According to Mills et al. (2020), disinformation about the COVID-19 vaccine and the COVID-19 vaccine's expedited clearance procedure are both factors that contribute to distrust.

Accessibility Barriers

Accessibility restrictions and inconveniences such as the vaccine delivery location, relative cost, time, distance, and sociodemographic changes impact the COVID-19 vaccination uptake. According to Fairhead and Leach (2012), specific individuals of the close relatives' group may occasionally influence more significant group decisions, which is likely to apply to decisions about receiving the vaccine. Thus, the person either

the husband or wife who receives the COVID-19 vaccine information disseminates COVID-19 vaccine information and is responsible for the family's decision-making to receive the vaccine or not might affect the vaccination uptake (Fairhead & Leach, 2012). Other factors include lower interest among men, low levels of education, and low socioeconomic status, which intersect with ethnicity (Fairhead & Leach, 2012).

Apprehension

The willingness to accept the offer of vaccination has been linked to anxiety, worry, and anticipated regret, all of which can result from judging situations or occurrences to be harmful (Godinho et al., 2016). Apprehension predicts intentions and behavior since it occurs when people anticipate that a bad event in the future will make them wish they had made a different choice. According to Brewer et al. (2016) and WHO (2020f), the direction of the effect will depend on how anticipated regret is applied: it demonstrates that anticipating regret for inaction (i.e., refusing vaccination and contracting an infection or infecting loved ones) is associated with a higher likelihood of vaccination, whereas anticipating regret for action (i.e., accepting vaccination and experiencing side effects) is correlated with a significantly lower likelihood of vaccination. Similarly, this expresses people's apprehension about COVID-19 disease and describes their motivation or demotivation for receiving the COVID-19 vaccine.

Low Confidence in Vaccines

Low levels of vaccination acceptance might stem from a lack of faith in vaccines, for instance, due to the perception that the vaccine will not be practical or that any adverse effects will be significant (MacDonald, 2015; WHO, 2020a). A person may lose

trust in the system that distributes vaccines, including healthcare professionals' abilities and other actors' motivations (Jamison et al., 2019; Vinck et al., 2019). For instance, doubts about the financial interests of pharmaceutical corporations or the politicization of vaccination may reduce confidence (Ozceylan et al., 2020).

COVID-19 Vaccine Ineffectiveness

People will still need to practice preventive behavior (such as wearing masks and keeping a distance) even after receiving the vaccine because COVID-19 vaccinations are ineffective. It could hinder vaccine adoption and uptake. It will be crucial to manage expectations and ensure that persons who have received vaccinations do not stop practicing protective behaviors and put themselves and others in danger (WHO, 2020f).

Individual and Group Differences

Some people may be reluctant to vaccinate because they have a low risk of infection. In contrast, others may be reluctant due to worries about the safety of vaccines, while others may be reluctant due to religious beliefs or a lack of faith in the healthcare system (WHO, 2020f). Thus, the differing individuals' or groups' attitudes to COVID-19 vaccination uptake is a determinant of several factors, including a low or high risk of the disease, safety concerns, differing religious teachings and beliefs, poor or failing healthcare system, and distrust in the government, among others.

Facilitators of COVID-19 Vaccination Uptake

Enabling Environment

Political decision-makers, managers of vaccination programs, community, and religious leaders, health professionals, members of civil society organizations, media

organizations, and online platforms influence COVID-19 vaccination uptake (WHO, 2020f). These key stakeholders such as healthcare providers, community leaders, and policymakers, can encourage or oppose vaccination by fostering supportive circumstances (Larson et al., 2021; WHO, 2023). The actions of policymakers who decide where to administer vaccinations or how long clinics are open influence can significantly influence how the public reacts to and engages with vaccination programs (Adebowale et al., 2021; Agyemang-Boakye et al., 2022).

Location, cost, duration, the experience of receiving the vaccination, information, the default, health legislation or mandates, among others, are other environmental variables influencing vaccination uptake (Ajayi et al., 2023; Agyemang-Boakye et al., 2022). Numerous approaches to building circumstances will encourage widespread vaccination considering these factors (Larson et al., 2021; WHO, 2023). To support desired behaviors and contexts within the population, interventions, and policies should be designed and implemented to remove environmental barriers and facilitate access to vaccination services (Adefuye et al., 2022; Emenena & Atuahene, 2021). For instance, vaccination rates may increase if all students are vaccinated by default in schools (those who object have the right to opt out) and not only those who choose to get vaccinated (Giubilini et al., 2019). Making vaccines readily available in secure, comfortable, and convenient settings can promote uptake (Schoch-Spana et al., 2020).

An enabling environment is rarely sufficient, even though it is essential and likely to boost vaccine acceptance and uptake. As a result, this should be complemented by focused, reliable, and unambiguous messaging from reliable sources highlighting the

value, advantages, simplicity, speed, and affordability of vaccinations (WHO, 2020e). Naturally, how simple, quick, and economical the vaccines will be accessible depends on the location. According to the WHO (2020e), health systems preparing for COVID-19 vaccinations receive guidance, training, and resources produced and made accessible for countries to adapt. Thus, the health system must be ready to lower barriers to supply, service delivery, and service quality and ensure that community and healthcare workers are well-trained and supported.

Societal Influences

Negative or inadequately positive social factors result in vaccine acceptance and uptake barriers. Beliefs about what members of one's social group do or what they accept and reject are known as social norms. They are examples of such influences (WHO, 2020g). For instance, low vaccination rates within a community, potentially driven by misconceptions about vaccine efficacy or concerns about side effects, can create a social norm of vaccine hesitancy, negatively influencing individuals who might otherwise be open to vaccination (Agyemang-Boakye et al., 2022; Ajayi et al., 2023). Conversely, high vaccination rates supported by the majority of community members can send a positive and reinforcing message to other communities hesitant about vaccination, potentially increasing their uptake (Emenena & Atuahene, 2021; WHO, 2023).

Media

The media's dominant narratives can also distort how people perceive what the majority thinks and do (WHO, 2020g). However, anti-vaccine views can be amplified and mistakenly perceived as the prevailing opinion despite being voiced by relatively

small but outspoken individuals or groups (Betsch et al., 2013; Lazard et al., 2020). During a pandemic, when people are confined and relying more on social media and online information for social cues, misconceptions about public opinion on health behaviors like vaccination can easily arise (Rimal & Storey, 2020; Smith et al., 2023). Countering anti-vaccine sentiment requires public awareness campaigns that address misconceptions with accurate information (Larson et al., 2021; WHO, 2023). Educating media outlets on responsible reporting practices and emphasizing the importance of context when mentioning anti-vaccine views can further curb the spread of misinformation (Roozenbeek et al., 2022; WHO, 2020g).

Social Networks

An individual's decision to get vaccinated may be affected by the social networks, which include his or her contacts, such as family, friends, coworkers, and other contacts, and the information they seek within those networks (Christakis & Fowler, 2007; Valente, 2010). When a large proportion of an individual's network expresses views toward COVID-19 vaccination, their vaccine uptake is likely to decrease due to social pressure and conformity (Cobb et al., 2017; Unek et al., 2023). Conversely, social support and encouragement from trusted individuals and communities can significantly increase vaccine uptake (Agyeamang-Boakye et al., 2022; Unek et al., 2023). Respect, trust, and positive social influence play a pivotal role in this process (WHO, 2020e). Individuals with central positions within social networks (e.g., healthcare professionals, and community leaders) can have a disproportionate influence on the spread of vaccine hesitancy or acceptance (Ajayi et al., 2023; Valente, 2010). The effectiveness of behavior

modification initiatives can be magnified by focusing on individuals' centralized positions in the network. For example, they focus on health professionals' sensitivity to the public because they possess more knowledge and opportunities to influence COVID-19 vaccination behavior.

Motivation

The decision to vaccinate is typically motivated by various variables, including an infection's perceived danger and severity, vaccination confidence, values, and emotions (WHO, 2020f). If people think they have a low risk of contracting COVID-19 or that contracting the disease will not have significant consequences, they will be less likely to receive the vaccine (Brewer et al., 2007). According to Betsch et al. (2015), some people could attempt to compare the danger of contracting an infection with the risk of receiving a new vaccine, concluding that contracting COVID-19 risk is lower. Meanwhile, WHO (2020g) argued that risk perceptions are produced via mental shortcuts since most people find comprehending and evaluating threats challenging. For instance, heuristic availability is a common way for people to assess the likelihood of events. As a result, based on personal experience or rumors, they may exaggerate some hazards (such as the likelihood and consequences of contracting an infection) while underplaying others (such as the chance of adverse effects following vaccination) (WHO, 2020g).

Infodemics Management

There is a risk of inaccurate information filling the knowledge gap in the rapidly changing context with many uncertainties around COVID-19 vaccinations (Clarke & Surendranathan, 2022; Dubey et al., 2023). The WHO (2020g) noted that people have

undoubtedly heard misleading information, rumors, and conspiracy theories due to the volume of material circulating about COVID-19, often known as the infodemic, which may reduce their trust in vaccination (Roozenbeek et al., 2022; WHO, 2020g). Some suggested tactics for managing infodemics are developing trustworthy sources, fact-checking, and reacting to misleading information through dedicated dashboards (Lazard et al., 2020; WHO, 2020g).

Managing Individual/Group Differences

Designing ways to overcome certain hurdles, such as individual or group differences, can be a good start by talking to communities early to understand their motivations. Lessons from earlier epidemics, including the Ebola virus, emphasize continuously monitoring shifts in community needs and feelings through regular feedback systems and modifying methods as necessary (UNICEF, 2020).

Strategies for Addressing/Preventing COVID-19 Vaccine Hesitancy in Nigeria

Community Participation

A strategy for overcoming COVID-19 vaccination resistance is community involvement. Community members can be motivated through the involvement of stakeholders in the community, such as traditional heads, chiefs, opinion group leaders, and religious leaders (Ilesanmi & Afolabi, 2020a, 2021). In this sense, community mobilization aims to accomplish two objectives: to refute untrue rumors about the COVID-19 vaccine and to ensure that health education about the vaccine's advantages is delivered. Community health workers, community pharmacists, patent medicine dealers,

and civil-based groups all have a part to play (Ilesanmi & Afolabi, 2020a; Ilesanmi et al., 2020e).

Community Mobilization

The potential COVID-19 vaccine can be widely utilized efficiently with community mobilization in Nigeria (Adefuye et al, 2022; Emenena & Atuahene, 2021). Since community involvement fosters a sense of ownership of any health intervention, implementing a non-traditional top-down approach while planning the COVID-19 vaccination activities in African countries (including Nigeria) may lead to rejection in many settings, defeating the goal of obtaining the vaccine and wasting resources (Adebowale et al., 2021; Agyemang-Boakye et al., 2022; WHO, 2023). On the other hand, community involvement would improve planning for the framework and methods for making vaccinations accessible in each African environment and enable the placement of vaccine collection locations in places that are acceptable to the community (Ilesanmi & Afolabi, 2020a; 2020b). Additionally, community involvement would prevent rivalry and conflict from placing vaccine collection sites in other regions without obtaining community approval (Ilesanmi & Afolabi, 2021).

Community Appreciation

Individual commitment to any project is proven to increase with feedback methods, and acknowledging prior efforts that helped make an event successful could be motivating (Haldane et al., 2019). Thus, recognizing and honoring religious and civic leaders who contributed to the success of previous immunization campaigns like the polio campaign can foster goodwill and strengthen engagement in future intervention programs

(Agyemang-Boakye et al., 2021; Whalen et al., 2020). Building on this understanding, actively showing appreciation for the community's prior support for health initiatives can significantly increase community involvement in the COVID-19 vaccine program (Ajayi et al., 2023; WHO, 2020a).

Developing a sense of community can be done without long-term preparation. Instead, the community leaders might receive gratitude through duly signed letters (Whalen et al., 2020; Emenena & Atuahene, 2021). Further, appreciation gatherings in town halls with representatives from the community and leaders present where monetary gifts and souvenirs/rewards will be awarded to community members who took part in the initiative (Agyemang-Boakye et al., 2021; O'Reilly et al., 2017). Understanding the need for community members' involvement in social activities benefitting the community will ensure that hesitancy to vaccination is not a threat while the COVID-19 vaccine program is accelerated (Ilesanmi & Afolabi, 2021).

Multisectoral Collaboration

Multisectoral collaboration is the best way to increase COVID-19 vaccination uptake and overcome vaccine hesitancy (Haldane et al., 2019). Many African nations need more resources than developed nations; thus, the national government might not be able to cover the cost of the COVID-19 vaccination on its own (Afolabi & Ilesanmi, 2021). Although COVAX (2020) has implemented a program to subsidize the cost of the COVID-19 vaccination for low-income nations, further assistance is required to allow African nations to purchase the COVID-19 vaccine on a big scale. Therefore, cooperation between the public and private sectors could increase the cost-effectiveness of the

government-issued COVID-19 vaccination in African nations (Ilesanmi et al., 2020d). However, cooperation to address COVID-19 vaccine hesitancy should be prioritized.

Multisectoral engagement in the COVID-19 outbreak response in Nigeria has produced the best results in procuring more personal protective equipment, testing kits, logistics, and financial resources (Ilesanmi et al., 2020e). To improve health education on the value of the COVID-19 vaccine, all sectors in every African nation should be responsive (Afolabi & Ilesanmi, 2021). Additionally, multisectoral cooperation might be enhanced to research social media users' hesitation or acceptance of the COVID-19 vaccination (Ilesanmi & Afolabi, 2020c).

Community Informants

Misleading claims about COVID-19 can be addressed by engaging community informants to alert sectoral leaders in each region or local government area (Ilesanmi & Afolabi, 2020c). Gaining knowledge in this area would be beneficial for putting techniques to dispel myths about the COVID-19 vaccination reluctance (Afolabi & Ilesanmi, 2021).

Integration of the COVID-19 Vaccine

A viable approach to overcoming vaccination hesitancy and enhancing vaccine uptake is integrating the COVID-19 vaccine into the current healthcare services. The horizontal system strategy reduces resource waste in healthcare and individual sectors by utilizing available resources (Ilesanmi & Afolabi, 2020c). The vertical implementation of the COVID-19 vaccination would likely result in a twofold increase in the expenditures associated with registration at healthcare institutions; however, by integrating the

COVID-19 vaccine, these costs and waiting time for vaccine collection are minimized (Ilesanmi & Afolabi, 2020c).

Additionally, the COVID-19 vaccine's integration enables its decentralization to encourage proximity to residential areas to lower the cost of transportation for many people (Ilesanmi & Afolabi, 2020). For instance, the routine immunization program in Nigeria has encountered difficulties due to vaccine hesitancy due to vaccine myths, travel, and parental absence. However, these obstacles may be eliminated if the COVID-19 vaccination were widely accessible to community members through an improved cold chain (Afolabi & Ilesanmi, 2021).

Cross-Country Empirical Evidence on COVID-19 Vaccine

Adetayo et al. (2021) examined the association between knowledge, attitude, and acceptance of the COVID-19 vaccine among university students in Osun State, South-West Nigeria. Data was gathered from 521 participants' responses to an online survey form. Of the 521 people who responded to the study, 74 (14.2%) said they had previously had the COVID-19 vaccination, while 286 (54.9%) planned to get the shot as soon as it became available. The intention to vaccinate shows an inverse, weak, and significant association with the attitude toward the COVID-19 vaccination. The intention to vaccinate, however, was strongly correlated with knowledge of COVID-19 vaccinations. The study concluded that students' attitudes and knowledge about vaccinations are crucial for their acceptance. Students' vaccination knowledge will be strengthened, and negative attitudes (unanticipated adverse reactions and mistrust) towards vaccination will clear, boosting vaccine acceptability.

Agha et al. (2021) investigated the factors influencing Nigerian healthcare workers' decision to receive the COVID-19 vaccine. Data from a July 2021 online survey of Nigerian healthcare workers of 18 and above years were selected. Multivariate Logistic regression analysis was performed to investigate factors influencing the receipt of two doses of a COVID-19 vaccination. A COVID-19 vaccination was reportedly received twice by one-third of the healthcare workers. Healthcare workers with high motivation and ability had a 15-times higher odds ratio of getting vaccinated, demonstrating the importance of motivation and ability as predictors of being fully vaccinated. Only 27% of healthcare workers demonstrated excellent ability and motivation primarily due to the healthcare workers' limited capacity for vaccination: Only 32% of healthcare workers said vaccinating against COVID-19 was extremely simple. The motivation was relatively high in comparison: A COVID-19 vaccination, according to 69% of the healthcare workers, was vital for their health.

In Abia State, South-East Nigeria, Amuzie et al. (2021) investigated COVID-19 vaccination reluctance among healthcare professionals and its sociodemographic variables. 42,200 healthcare professionals in Abia State were chosen for the cross-sectional study using an online questionnaire. The relationship between the sociodemographic variables and vaccine reluctance was examined using bivariate analysis. They discovered that 67.1% of the responders were female, with a mean age of 40.6 $\pm$ 9.5 years. The reluctance rate for the COVID-19 vaccine was 50.5%. They found that healthcare professionals had a high level of hesitation with the COVID-19 vaccine. Sociodemographic factors influence the uptake of the COVID-19 vaccine.

Anorue et al. (2021) studied South-East Nigeria residents' knowledge of and attitudes toward COVID-19 vaccine safety media messaging. 399 respondents (18-47 years old) from urban and rural South-East Nigerian areas participated in a cross-sectional descriptive study. The study used a standardized self-administered questionnaire that included the respondents' demographic information and questions about their awareness of and attitudes toward media messages about the safety of the COVID-19 vaccine. They discovered that the COVID-19 vaccination caused anxiety in the respondents. While 42.4% disagreed with the safety of COVID-19 vaccine safety messages, 26.1% of respondents thought the vaccine messages were moderately convincing regarding human safety, and 5.5% thought they were poor (Anorue et al. 2021). In addition, 26.1% of respondents thought the vaccine messages were compelling regarding human safety. In South-East Nigeria, respondents' awareness of the vaccine's safety was limited, and their attitudes were unfavorable (Anorue et al. 2021).

A total of 44,260 people were included in Arce et al.'s (2021) analysis of COVID-19 vaccination acceptance and hesitation across 15 survey samples from 10 low- and middle-income countries in Asia, Africa, South America, Russia, and the United States. In comparison to the United States (mean 64.6%) and Russia (mean 30.4%), they discovered that the readiness to receive a COVID-19 vaccine was significantly greater in the low- and middle-income samples (mean 80.3%, median 78%, range 30.1 percentage points) (Arce et al. 2021). In low- and middle-incomes, the desire for personal protection against COVID-19 primarily explains vaccine adoption, while worry about side effects is frequently cited as a deterrent. The most reliable sources of information on COVID-19

vaccines are health professionals. Evidence from this sample of low- and middle-incomes suggests that giving the global south priority regarding vaccine distribution will positively impact increasing global vaccination coverage.

Nigerians' perceptions, knowledge, and preparation for the COVID-19 vaccination experiment were evaluated by Enitan et al., in 2020. A 39-item survey instrument (questionnaire) was utilized in the cross-sectional, web-based study, and bivariate analysis was done using chi-square and bivariate logistic regression at a significance level of 5%. Adult respondents (18 years and older; median age: 34.5 years) from the six geographical zones provided a total of 465 responses: South-West (48.4%), North-Central (17.2%), South-South (16.3%), South-East (9.7%), North-West (4.5%), and North-East (3.9%). Most participants (80.2%) got information about COVID-19 via social media. 39.0% had an unfavorable opinion of the COVID-19 vaccine trial, and 96.0% had little awareness of the disease. 22.6% of people had no opinion about the start of the COVID-19 vaccine trial in Nigeria, 59.8% supported it, and 17.6% did not. Compared to 20% who were willing, 80% of respondents expressed a lack of interest in the COVID-19 vaccine experiment (Enitan et al., 2020).

A systematic review of the attitudes, acceptance, and hesitancy of the global population to receive COVID-19 vaccines and their underlying causes was undertaken by Cascini et al. (2021). 209 studies complying with PRISMA standards were included. The Newcastle Ottawa scale for cross-sectional research was used to assess the effectiveness of the studies. Vaccination acceptance rates vary significantly between countries and throughout time, with Arabian nations showing the highest levels of hesitancy compared

to other parts of the world. They discovered that a wide range of factors, such as having a negative view of vaccine efficacy, safety, convenience, and cost, contributed to increasing hesitation. Women, younger participants, those with lower levels of education, low income, no insurance, residing in rural areas, and race or ethnic minorities were some sociodemographic groups linked to an increased reluctance to vaccine uptake.

In Ibadan, South-West Nigeria, Ilesanmi et al. (2021a) analyzed community members' perceptions and willingness to pay for a potential COVID-19 vaccination. An interviewer-administered questionnaire was utilized in the descriptive cross-sectional study design to collect data. 292 respondents (67.30%) said they had heard of the potential COVID-19 vaccination. 232 (79.50%) expressed a favorable opinion of the COVID-19 vaccine. Compared to people in the first wealth quintile, people in the fifth wealth quintile were ten times more willing to pay for the potential COVID-19 vaccination. It was suggested that the proposed COVID-19 vaccination should be subsidized and made available at no cost.

Iliyasu et al. (2021) evaluated the COVID-19 vaccine acceptability predictors and determined the causes of vaccine reluctance among adults in metropolitan Kano, northern Nigeria. A cross-section of 446 adults was given structured surveys using a mixed-methods methodology and 20 in-depth interviews. The framework method and binary logistic regression were used to analyze the data. Half of the respondents (51.1%) were open to receiving the COVID-19 vaccine. Older respondents (> 30 years) were more likely to accept vaccinations, higher income earners (30,000 Naira), and people with a history of a chronic medical condition. Additionally, those who perceived risk as high

were indifferent about vaccine safety, were indifferent about vaccine efficacy, and were indifferent about misinformation related to infertility. They concluded that respondents' age, income, co-morbidities, risk perception, and worries about vaccine efficacy and safety led to the suboptimal acceptance of the COVID-19 vaccine, which was also influenced by these factors.

In Bangladesh, 1658 people participated in a community survey by Islam et al. (2021) to learn more about their attitudes, knowledge, and perspectives on the COVID-19 vaccine. They used multiple linear regression and semi-structured and self-reported questionnaires to collect the data. They discovered that the mean scores for knowledge and attitudes were 2.83 $\pm$1.48 (out of 5) and 9.34 $\pm$ 2.39 (out of 12). Only 60% of participants said they would receive the COVID-19 vaccination, and around two-thirds said they would suggest it to family and friends. 61% of participants said that health workers should be vaccinated first, while over half said everyone should be vaccinated. Nearly 90% of respondents thought the COVID-19 vaccination in Bangladesh would have adverse effects, and 95% said the vaccine should be administered free of charge in Bangladesh.

In Delta State, South-South Nigeria, Josiah and Kantaris (2021) conducted a study on how COVID-19 disease was perceived and how vaccinations were received. The online cross-sectional survey study included 400 people from three local government areas in the Delta's north, central, and south senatorial districts. They discovered that 48.6% of people were ready to accept the vaccination, 53.9% were aware that Nigeria was interested in implementing it, and 76.6% were aware that the vaccines were under

development. At *p* 0.05, a statistically significant association between vaccine acceptance and gender, religious affiliation, education, employment status, income, knowledge of a COVID-19 patient, self-reported COVID-19 susceptibility and individual agreement with the efficacy of government COVID-19 interventions was observed.

In Ibadan, Oyo State, South-West Nigeria, Ojewale et al. (2022) studied COVID-19 vaccine attitudes and its predictors among people with chronic health issues. A descriptive cross-sectional study was conducted among 423 patients at the University College Hospital's medical outpatient clinic in Ibadan, Oyo State, Nigeria. The Open Data Kit software gathered information on sociodemographic and COVID-19-related traits. Chi-square and multivariate logistic regression analyses were used to analyze the data at a 5% significance level. The overall percentage of patients who had a favorable attitude about receiving the COVID-19 vaccination was 46.6%; of these, 29.6% trusted the vaccine's benefits, and 46.6% were unconcerned with the vaccine's side effects, and 11.1% were unconcerned with the vaccine's potential for commercial gain.

In 11 communities in the Jada Local Government Area of Adamawa State of North-Eastern Nigeria, Sato and Fintan (2020) assessed the relationship between fear of vaccination, knowledge, actual behaviors, and perception among caregivers. The correlation was assessed using a logistic regression model. 15% of caregivers said they fear vaccinations, but there is no correlation between the fear and most caregivers' sociodemographic traits. Fear is highly connected with inaccurate vaccination knowledge, a decreased likelihood that their children would receive vaccinations, a lack of belief in the value of vaccination, and a lack of intention to vaccinate their children.

Level of education, income, awareness of COVID-19, living arrangements, and faith in government were linked to overall vaccine attitude. Confidence in the government was the most significant influencing factor in the vaccine-positive attitude.

A population-based cross-sectional study on the acceptance of the COVID-19 vaccination in Nigeria was conducted by Tobin et al. (2021). Using an online questionnaire, they collected demographic information, risk perception, trust in governmental and public health authorities, and willingness to take a future COVID-19 vaccine. At a 95% confidence level, chi-square and logistic regression were performed. 50.2% of respondents said they would be open to receiving a COVID-19 vaccination. Growing older, being a man, believing in government, believing in public health authorities, believing in vaccine developers, being prepared to pay for and travel for a vaccine, and getting the COVID-19 vaccine during an outbreak were all strongly linked to acceptance of the vaccine. Regarding their desire to receive vaccinations, healthcare workers and respondents with pre-existing medical issues did not differ substantially from non-healthcare workers and respondents without medical conditions, respectively. It was concluded that one in two people would accept the COVID-19 vaccination when available nationwide.

Literature Gap

Although literature exists on COVID-19 vaccine acceptability in Nigeria (Adetayo et al., 2021; Iliyasu et al., 2021; Josiah et al., 2021; Tobin et al., 2021), media exposure and COVID-19 vaccine (Anorue et al., 2021), but no research has explored the reasons why the unvaccinated Nigerian population remained unvaccinated or hesitance to

COVID-19 vaccination. Thus, this study explored why the Nigerian population remained unvaccinated or hesitant about COVID-19 vaccination.

Summary of Literature Reviewed

In Chapter 2, I presented the literature search strategy, keywords used to search for the literature reviewed, and the HBM's theoretical framework. I discussed the literature searched under the following headings: Overview of COVID-19, COVID-19 vaccination uptake, and COVID-19 vaccine hesitancy. Further literature discussions focus on the knowledge of COVID-19 vaccination uptake, attitude towards COVID-19 vaccination uptake, barriers to COVID-19 vaccination uptake, facilitators of COVID-19 vaccination uptake, strategies for addressing COVID-19 vaccine hesitancy in Nigeria, and cross-country empirical evidence. In Chapter 3, I present the methodology, which includes the research design and rationale, role of the researcher, participant selection logic, instrumentation, procedures for participants recruitment and data collection, data analysis plan, issues of trustworthiness, and ethical procedures.

Chapter 3: Research Method

Introduction

In this qualitative study, I explored the knowledge, attitudes, and hesitancy toward COVID-19 vaccination uptake in Nigeria. Through this study, I put together an understanding of the research phenomenon, contributed to the body of knowledge, bridged a public health gap, and generated findings that promote positive social change. The discussion in Chapter 3 includes the research design and rationale for using the method, my role as the researcher, and the preferred methodology for the study by detailing the participant's selection logic; instrumentation; procedures for recruitment, participation, and data collection; data analysis plan; trustworthiness issues; and ethical guidelines for the study.

Research Design and Rationale

This study was a qualitative phenomenological study. The phenomenological research design technique was first constructed and theorized by Husserl (1931) to comprehend the context of research participants' lived experiences and the meaning of their experiences. A lived experience is a specific event that could be a first-order activity or a second-order mental and affective reaction, such as remembering, feeling regret, and seeking, among many others (Husserl, 1931). Thus, I used the phenomenological research methodology to reflect on the lived experience of research participants (see Smith et al., 2009). In discussing the study of phenomena, the discussion should emanate from a person's conscious experience (Gill, 2020; Moran, 2000). Thus, a phenomenological study aims to examine a concept in detail for the complex world of

lived experiences of the research participants' perceptions. It helps to explore human nature and gain a more in-depth understanding of a phenomenon while also experiencing a change on a personal level. This approach supported me in critical reflection and attention to social practices (see Sadruddin, 2018).

I used IPA (also known as the heuristic phenomenological approach) as a qualitative research methodology in this study (see Alase, 2017). The rationale for using IPA lies in its capacity to explore and analyze the research participants' lived experiences. As a participant-oriented research design study, Smith et al. (2009) maintained that IPA subjectively examines the research participants' lived experiences.

Additionally, the IPA research method emphasizes people's actual experiences and proposes that these experiences can be understood by looking at the meanings that people ascribe to them. In other words, I needed to participate in intimate interpretive interaction to make meaning of what was being said or written (see Alase, 2017). Also, IPA aims to provide a comprehensive examination of the lived experience of a limited group of participants and focuses on the convergence and divergence of experiences.

IPA's two main objectives are to explore how the research participants interpret their life experiences and to help thoroughly interpret the story to comprehend the event (Tuffour, 2017). The IPA research method also enables multiple research participants with similar encounters to share their experiences without fear of being misrepresented. According to Creswell (2012), a phenomenological investigation describes the ordinary meaning of numerous people's lived experiences of a concept or phenomenon. Therefore,

phenomenologists outline the features all participants share as they go through a phenomenon.

RQs

In this qualitative study of phenomenological research design, there were three central RQs:

RQ1: What is the relationship between COVID-19 knowledge and COVID-19 vaccine hesitancy among the unvaccinated population between the ages of 18 to 60 years in Nigeria?

RQ2: What attitudes to COVID-19 vaccination can influence vaccine hesitancy among the unvaccinated population between the ages of 18 to 60 years in Nigeria?

RQ3: How do sociocultural (education, occupation, religion, beliefs, culture, ethnicity) factors influence COVID-19 vaccination hesitancy among the unvaccinated population between the ages of 18 to 60 years in Nigeria?

Role of the Researcher

As the researcher, I explored the participants' lived experiences as they described the phenomenon under study. According to Fink (2000), the role of a researcher in a qualitative study can be divided into seven criteria: thematizing, designing, interviewing, transcribing, analyzing, verifying, and reporting. Thus, my role as a qualitative researcher was to investigate and interpret how the subject matter affected the participants' lived experiences. In practicing these roles, I observed the participants' experiences from their viewpoint to comprehend the lived experiences of the research participants (see Alase,

2017). As a qualitative researcher, I investigated and interpreted how the research subject matter affected the participants' lived experiences.

I recruited 28 individuals and interviewed the participants after seeking Walden IRB approval. The rationale for the maximum sample was to ensure adequate representation of participants across the country and to ensure the participants would provide an understanding of the study RQs and enhance insights into the study context. Selected locations for meeting with potential recruits provided a friendly environment that included privacy, comfort, and trust so the participants could speak freely about their personal experiences without fear of intimidation or misrepresentation. My family members, friends, and colleagues were excluded as research participants. This study was voluntary, and incentives were given to the participants. I made these facts known to the participants and thanked them immensely for participating in the study to promote science and improve health.

I educated participants about informed consent, and their voluntary participation was sought for the study (see Appendix A). I distributed and encouraged the participants to read, ask questions, and express their understanding of the contents before proceeding with the interview process. I used the electronic device and written consent to obtain consent approval that was later processed into data. After that, I proceeded to the semistructured interview guide (see Appendix B).

Further, I installed Descript Artificial Intelligence-Powered software on my Hewlett Packard Laptop to record the interview proceedings. The choice of Descript Artificial Intelligence software was to support me to audio-record the interview processes

for instant transcription of the recordings within a few minutes for an immediate review of the transcript with each research participant. The software permitted editing of the transcripts, such as deleting and filtering words, shortening word gaps, and including explanations for in-depth understanding.

I conducted internet-based (such as Zoom, WhatsApp, and Skype) interviews to facilitate observation of the participants' behaviors as they responded to the semistructured interview questions. In addition to recording the data, I edited the transcripts for errors, repeated words, and potential biases in the collected data. To comprehend and narrate the lived experiences of the research participants accurately, I analyzed the participants' responses. A key point I concentrated on was the context analysis; then, I explored the underlying reasons for the phenomenon and attempted to identify potential explanations to ensure they aligned with the study's goals before I presented the findings.

Methodology

Participant and Sampling Strategy

The target population for this study was the unvaccinated population for COVID-19 disease, ages 18 to 60 in Nigeria. The age limit of 60 years was used to ensure that only participants who could narrate their lived experiences on the study phenomenon were recruited. This helped generate an in-depth understanding to answer the study's RQs and provide a basis for formulating policies for positive social change. To recruit the participants, I used a purposive sampling strategy to select eligible individuals

nationwide. Smith et al. (2009) believed that samples should be purposively chosen for phenomenological studies so the participants can give insight into a particular experience.

Creswell (2012) and Foss and Waters (2007) noted that it is crucial to calculate the required sample size before choosing volunteers for a study. These authors added that the number of research participants for this phenomenological research tradition could range from two to 25. Thus, I interviewed 18 participants between the ages of 18 and 60 years who were unvaccinated, using a purposive sample strategy. There was a possibility of continued recruitment and interviewing participants until data were saturated – when additional participant recruitment added no information to the information collected. As mentioned earlier, research participants were recruited nationwide. This sample size and distribution selected assisted in analyzing the convergence and divergence of the participants' lived experiences across Nigeria.

Further, the participants chosen were those with firsthand knowledge and experience of the phenomenon under study based on objective judgment and the purpose of the study —unvaccinated populations for COVID-19 disease ages 18 to 60 in Nigeria. Creswell (2013) explained that each participant is expected to have comparable firsthand knowledge of the topic under investigation. Thus, the individuals chosen could clarify the central phenomenon of this study. I employed a snowball sampling strategy to find more participants if the recruited participants and interviews conducted were insufficient and saturation was not reached. The snowballing technique increased the sample size by asking the participants to suggest more participants for interviewing (see Groenewald, 2004; Foss & Waters, 2007). I continued recruiting participants until saturation took

place. When data saturation occurs, no additional participants are needed. Gentles et al. (2015) and Foss and Waters (2007) reported that collecting more data after saturation results in little to no new study information.

In recruiting participants, I posted recruitment flyers on billboards and bulletins to locate unvaccinated individuals for the COVID-19 study in Nigeria. After that, I followed up with potential participants who contacted me for the study. I called the participants, introduced myself, asked for their emails, and shared the research invitation letters. I consistently used both channels (phone and email) to reach research participants. I also used the snowballing sampling technique to recruit more participants for the study. For those who expressed interest in the study, I explained their rights as research participants and shared participant informed consent with them. I also asked them to read and sign the informed consent form. I conducted all the interviews in English because English is Nigeria's official lingua franca.

Instrumentation

I developed an invitation letter to introduce myself and the study to the research participants. I also developed a semistructured interview protocol for interviewing the study participants. Moreover, I developed an informed consent form that outlined the participants' rights and how the study interview would proceed. This form was a contract between the participants and myself (the researcher). The instrument for data collection included published materials on the research phenomenon, such as peer-reviewed literature.

The semistructured interview guide contained open-ended questions to let participants give in-depth responses. I explored the RQs when developing the semistructured interview questions to ascertain participant responses to the study phenomenon. Inquiries probed the participants' hesitance to receive COVID-19 vaccination to discover why they remained unvaccinated. To ensure a comprehensive data collection, I provided the semistructured interview guide to the research committee for assessment and incorporated their suggestions into the instrument. To accomplish this, the interview mode was an internet-based communication phone service (such as WhatsApp, Messenger, Skype, and Zoom) to allow research participants who may have had a preference to participate in the study.

Data Sources and Data Collection

I obtained the Walden University IRB approval to conduct the study. Afterward, I posted recruitment flyers on bulletins and billboards, so unvaccinated individuals for COVID-19 in Nigeria could respond (by email/phone) for recruitment. After that, I followed up with any participant who contacted me for the study. I emailed the potential research participants the invitation letters introducing the study. Then, I advised them of their rights to participate in the study in an informed consent letter after getting their favorable feedback.

Once I had the participant's interest, I sought their preference in scheduling the interview location and time. A less distracting location, such as a public library, was suggested to the participant for the interview process. The time slated for each participant

during the interview was 60 minutes or less. The internet-based phone interview procedure was one interview per participant.

I established rapport with the study participants at the onset of the interview so they were at ease about the process before the interview session began. This also helped me to prepare the participants to understand and comprehend the interview questions and build their confidence in me (see Foss & Waters, 2007). Smith et al. (2009) confirmed that the most crucial element at the start of the interview is to build a rapport with the participants to acquire helpful information from the study participants. Smith et al. reiterated that I would be unlikely to get helpful information from my study participants if I was unsuccessful in building rapport with them.

With the consent of the participants, I audio-recorded the interviews using the Descript Artificial Intelligence-powered software on my Hewlett Packard laptop to document the participants' responses or data. I ensured every interview had a code, such as Participant, November 21, 2022, allocated to it. The various interviews were distinguished by an alphabet character when more than one interview occurred on a given date, for example, Participant B, December 18, 2022. I recorded direct observations of the research participants and any other nonverbal cues to support accurate data collection and note-taking during the interview process. I listened to the recordings of each interview on the Descript Artificial Intelligence software once I finished the interview and improved my notes. I transcribed the words, phrases, and remarks into data for analysis. I reviewed/studied literature, articles, reports, and bulletins on the study

phenomena in addition to the information collected from the research participants to ensure the credibility and validity of the study contents.

After conducting each interview, I undertook member checking by reading each transcript or playing the audio recording to the participants, along with my notes. Before the data analysis, conclusion, and presentation, I sent the transcribed data to participants who had an email to double-check, confirm, or add more information to the interview responses. After the interview, I accepted missing information and add-ons within the first week. Individuals who did not respond to the email or follow up with an update were assumed to have approved the data transcription.

Rubin and Rubin (2012) contended that researchers should have a robust security system to keep the information they have gathered out of the hands of unauthorized individuals. This system should include a password-protected file and storage system for research data. Therefore, I downloaded the recorded data to a password-protected computer to achieve this. Additionally, I stored the note in a safe in my library. As Walden University mandates, the data will be demagnetized and shredded after being retained for 5 years.

Data Analysis Plan

During data analysis, the IPA tool was used for the in-depth exploration of the research participants I engaged in. According to Eatough and Smith (2016), in-depth accounts of each case may initially be made available as part of the careful study of particulars carried out by IPA before patterns of convergence and divergence between cases are sought after. I adhered to Rubin and Rubin's (2012) seven phases for data

analysis because my study was qualitative–phenomenological. This allowed me to use IPA to mine the data for potential meanings that assisted the study phenomenon to manifest (see Smith et al., 2009).

Data gathered via the semistructured interview guide were analyzed by (a) transcribing and reviewing the data, (b) identifying and extracting codes from the interview transcripts to develop the themes, (c) categorizing the codes into a single data file to ensure a methodological data analysis process, (d) condense, recategorize, compare the data, and summarize the results of each category, (e) review the categories generated, (f) integrate the themes, and (g) establish the research findings (see Rubin & Rubin, 2012). I reviewed each interview's transcript and tape to ensure clarity. I saved the audio transcriptions to my laptop and turned them into written transcripts using Microsoft Word's Transcribe feature.

Then, I uploaded it into NVivo qualitative data analysis software 12 to analyze the data. I read the transcripts to help me develop or generate themes and categorizations in the pattern of responses provided by the research participants. I studied the transcripts of the interviews to look for recurring words or phrases among the participants' responses to find similar themes. To code the data, I used famous words expressed by participants. I created an overarching theme by clustering or categorizing the coded data. Then, using the NVivo qualitative data analysis software 12, I coded and transcribed the data to produce themes. Saldana (2016) mentioned that data transcription and coding techniques represent the researcher's natural and intentional coding.

Thus, I attempted to capture and reflect the essence of the lived experiences of the research participants by using the seven steps of the data analysis without distorting or misrepresenting the essence of what the participants have gone through (see Alase, 2017). To do this, Creswell (2013) suggested I create a list of essential assertions that serve as the basis for comprehending the phenomena. As a result, I created assertions based on the interview notes and other pertinent literature reviewed on the studied phenomena. I took the essential points, organized them into codes, and categorized or clustered them into themes. After that, I described the phenomena as the study's participants experienced them, utilizing direct quotes or descriptions to support the literature.

Issues of Trustworthiness

Scholars such as Guba (1981) proposed four criteria for consideration by qualitative researchers or positivist investigators in pursuit of a trustworthy study. These include credibility, transferability, dependability, and confirmability.

Credibility

Credibility is a fundamental requirement for internal validity to be addressed by positivist researchers to ensure that their study measures or tests what is genuinely intended or designed for the study. To this end, researchers must ensure that persons participating in the research are correctly recognized and described, following Lincoln and Guba's (1985) criteria for establishing credibility. The selection and description of the participants could be supported with several sampling techniques to obtain reliable data (Elo et al., 2014). Therefore, I make provisions to increase confidence that I accurately documented or interviewed participants on this study phenomenon.

Before data collection, I reached out to participants, got to know them by introducing myself, using the invitation letter, and developed a rapport with them. I established a cordial relationship to get the participants' attention and urged them to be honest and open in their discussions on the study. More precisely, I urged individuals interested in the study to participate, and those who needed clarification could withdraw if and when they chose to.

Researchers like Lincoln and Guba (1985) and Erlandson et al. (1993) have advocated for sustained interaction between the investigator and the participants for the former to develop a trusting connection with the latter and to understand the organization adequately. I was cautious while using prolonged participation to avoid becoming too engaged in the culture and letting it influence my professional judgments about the study.

I selected participants nationwide that capture various perspectives and produce comprehensive, reliable results. It guaranteed that the sample participants were not random but purposively recruited from sampling approaches from the zones. I encouraged and reminded the participants to explain their lived experiences thoroughly and assured them there would be no correct or incorrect answers to the posted questions. I used a strategy of iterative questioning to evaluate participants' responses to specific questions. I questioned them to get information in depth. Thus, it might necessitate reviewing the informant's earlier points and rephrasing queries to elicit relevant information. Inconsistencies observed in utterances noted as inappropriate or falsehoods were filtered. I used detailed descriptions to detail the responses, attitudes, knowledge,

behavior, beliefs, and other conversations the participants gave to substantiate their opinions and experiences.

I verified the accuracy of the data gathered after the interview. I ran a member check after data collection. I read the transcripts aloud to verify their responses to questions or played the interviewee the audio recording. Participants could withdraw or erase any points or answers they had already made in response to a question or add more information to support their argument. Also, I reviewed literature or other documents to build more support for the context and justification of the participants' attitudes and behaviors and their perceptions of the study phenomenon. I evaluated earlier findings on the phenomenon under study to determine whether the study was consistent with the body of evidence. It is a crucial evaluating factor for academic work involving qualitative investigation to contribute to the body of knowledge.

The research committee and I met for debriefings to discuss and get advice on the collected and analyzed data. This enabled me to seek guidance based on their perspectives and experiences as experts in the field. The committee's advice also provided insights into formulating themes and evaluating the data, so prejudices and preferences did not come through in the research. Similarly, the study was available to other academics or professors for assessment and feedback to improve the study.

Transferability

Transferability relates to this study's external validity. That is, it broadly relates to how the outcomes of this research can be used in different contexts. Thus, it necessitates generalizing the study's conclusions to populations like Nigeria. Shenton (2004) asserted

that it is difficult to prove that qualitative research findings and conclusions apply to other settings and groups because it is specific to a few places and people. Thus, researchers can relate a qualitative study finding to their circumstances if the study environment is like their own, according to Bassey (1981).

However, many researchers have called for adequate background knowledge about the fieldwork locations to allow the reader to make this transfer (Lincoln & Guba, 1985). I provided a sufficiently detailed description for scholars and individuals to properly understand the phenomenon under investigation and compare the instances described in the research report with those they have observed emerging in their circumstances.

Considering this, I ensured the study's findings, reporting of results, analytical method, and results were valid and credible. I explained the lived experiences – attitude, knowledge, setting, choice, and the participants' characteristics. Also, I shared the study findings so that readers can search for alternative interpretations (see Graneheim & Lundman, 2004). The findings were improved by showing examples of scientific and skillful writing, allowing readers to compare their analyzed results to others.

Dependability

Dependability addresses the reliability of this study because it refers to data stability throughout time and in diverse environments. Scholars argue that the qualitative researcher or positivist must employ strategies to show that the findings would be comparable if the study were duplicated in the exact location using the same methods and with the same interviewees. I used the IPA tool because it allows researchers to describe

the participants' lived experiences concerning the study phenomenon. More so, Lincoln and Guba (1985) have emphasized the connections between dependability and credibility, contending that proving the former helps to guarantee the latter. Complementary techniques, such as focus groups and individual interviews, can help achieve the intended results (Shenton, 2004).

I succinctly described the methodology and results to make it easier for future researchers to replicate the study in a different setting. The discussion provided details about the study design and implementation, the operational aspects of data collection, the specifics of the fieldwork, a reflective evaluation of the project, and an assessment of the success of the exploration process. To evaluate the applicability of the findings to various environments, I thoroughly discussed the guiding principles and selection criteria used to choose participants, as well as the critical characteristics of the participants to be selected (Elo et al., 2014; Moretti et al., 2011).

Confirmability

Confirmability is concerned with my objectivity in this qualitative study. This calls for careful adherence to the necessary rules to help ensure that the study's conclusions relate to the experiences and thoughts of the informants rather than objective preferences and traits (Elo et al., 2014; Polit & Beck, 2012). It will entail triangulation to promote confirmability and lessen personal biases. According to Miles and Huberman (1994), one of the essential criteria for confirmability is how much the researcher is willing to admit their biases.

Within this context, I justified the choice of method for this study. I discussed the rationale for the methodology over other available methods, which helped to highlight the advantages of the strategies used. I thoroughly reviewed this study's findings and filtered those that were ultimately not indicative of the data. I succinctly presented the study audit trail to show how decisions and processes occurred throughout the research process. This required a data-oriented approach, in which I clarified how the study's data collection and processing eventually resulted in the creation of recommendations. More specifically, I studied and discussed how the research topic's ideas led to the study.

Scholars argued that more than one person should study the data to boost data comprehension and provide a detailed and reliable interpretation (Burla et al., 2008; Schreier, 2012). I performed the data analysis under the supervision and with the assistance of the research committee and other faculty members. Scholars in the Faculty who were familiar with the study phenomenon assessed and studied this research to determine whether the study results were accurate.

Ethical Procedures

An application seeking approval from the Walden IRB to satisfy ethical standards was processed and filed. The Walden IRB approval number was 04-19-23-1013411. The study participants were eligible when IRB was approved. I also adhered strictly to and followed the IRB regulations for this doctoral study. In this interpretative phenomenological study, I collected data from purposively selected participants. Participants understood their rights to participate willingly and withdraw from the study when deemed fit. It is essential to engage participants in conversations to discuss the

consent form, express understanding, and obtain approval before commencing with the semi-structured interview guide to elicit information.

Before the commencement of the interviews, the participants were aware of their rights and assured of privacy to personal information. I assured the participants that no private or confidential information would be requested and that they were free to express their feelings or thoughts and opt out of the study whenever they considered it necessary. Also, I ensured the participants understood that the data provided would be only for this study. Besides me (the researcher), no one else may access the information revealed during the interview, intentionally or unintentionally. I will keep the participants' identities confidential and not disclose them to anybody. Before or after the study findings are released, no person or organization can connect the participant's information to the participants. I supported participants' requests for a scheduled location and time that was less distracting and did not expose participants to external influence or interruption to ensure the data collection quality. Information collected will be maintained in a password-protected computer library for 5 years before elimination through shredding and demagnetization.

Summary

In Chapter 3, I discussed the research design and the rationale for choosing this design to explore the research phenomenon. I succinctly discussed the sampling strategy for recruiting potential participants for the study. I also enumerated my role as the researcher and presented the methodology for collecting and analyzing data and the research instrument designed for data collection. Further discussions include the data

sources, collection procedure, analysis plan, and the study's credibility. In Chapter 4, I discuss the study settings and demographic findings. I also present the data collection methods and analytical strategies.

Chapter 4: Results

Introduction

In this phenomenological qualitative study, I explored the knowledge and attitudes toward hesitancy to COVID-19 vaccination uptake in Nigeria. I developed three central RQs to achieve the purpose of the study.

RQ1: What is the relationship between COVID-19 knowledge and COVID-19 vaccine hesitancy among the unvaccinated population between the ages of 18 to 60 years in Nigeria?

RQ2: What attitudes to COVID-19 vaccination can influence vaccine hesitancy among the unvaccinated population between the ages of 18 to 60 years in Nigeria?

RQ3: How do sociocultural (education, occupation, religion, beliefs, culture, ethnicity) factors influence COVID-19 vaccination hesitancy among the unvaccinated population between the ages of 18 to 60 years in Nigeria?

To succinctly answer the central RQs, I engaged in detailed chapter presentations covering the introduction, research setting, demographics, data collection, data analysis, evidence of trustworthiness, results presentation, and summary of the study.

Ethical Approval and Study Setting

On April 19, 2023, the Walden IRB approved this study. I posted the research flyer on electronic bulletin boards to recruit volunteers. I shared the study's introduction letter, IRB consent form, and semistructured interview guide with the first 15 volunteers who contacted me and agreed to participate in the study to facilitate the interview process. I asked the potential volunteers to email me with the subject "I consent" to

express their voluntary interest in participating in the study, as indicated in the IRB consent form.

After our initial chats, I followed up with the volunteers by calling and emailing to further discuss their availability for the interview's day and time. I allowed each volunteer to choose their preferred day and time. I employed the snowballing sampling strategy to recruit seven participants by asking the first group to suggest additional participants who satisfied the study's inclusion criteria. Just like the first group of volunteers, the second group of six volunteers willingly contacted me to participate in the study, and, using the same protocol, I introduced the study to them, obtained their consent, and arranged a time for the semistructured interview. Overall, 28 participants from different regions of Nigerian society were recruited. However, only 18 recruits were interviewed; the remaining 10, for multiple reasons (technical issues such as poor internet, lack of internet data, withdrawal of consent, time-consuming, and refusal to answer their phones), did not participate.

This study interview coincided with the electioneering campaigning for the offices of the president, vice president, Senate, House of Representatives, and House of Assembly in the federal capital territory and the 36 federation states, creating minimal conflict. The frequent political thug attacks, worries about a change in democratic administration or leadership, and electioneering activities made participants reluctant to participate in the study. Because of this, participants were cautious about saying or expressing anything that would portray them as being against any potential

administration because doing so might have placed them in a precarious position later with concerned political elites.

Demographics

In qualitative studies, Hammer (2011) emphasized that gathering and describing the research participants' distinct characteristics is essential. The participant's age, gender, race or ethnicity, socioeconomic condition, level of education, and languages spoken must all be published, at the very least. Additional information may be relevant to the specific investigations, depending on the demographics being investigated and the study problems. Such details might include but are not restricted to, the participant's age, immigration status, cultural group, country of origin, number of years as a citizen, the dialect spoken, linguistic experiences, and other traits that could help understand the study outcome (Beins, 2009).

Within this context, I purposively selected 18 participants out of the volunteers for this interpretative phenomenological study. The purposive sampling strategy was employed based on a set of inclusion criteria for the study, which were as follows:

1. Individuals who had not been vaccinated for COVID-19 disease.
2. Persons who were aged 18 to 60 years at the time of the study.
3. Persons who were citizens of Nigeria and resided in Nigeria.
4. Individuals who were potential volunteers, educated, and could speak the English language eloquently to express their viewpoints on the RQs in generating insights for the study phenomenon.

In alignment with the study's ethical agreement on the confidentiality of the research participants, I used identifiers to describe the participants from Participant 001 to Participant 018. The study participants' demographics are presented in Tables 1 and 2.

Table 1

Participants' Demographics—Gender and Education

Demographic variable		Participants = 18
Gender	Male	10
	Female	8
	Total	18
Education	Undergraduate	2
	Post graduate diploma	2
	Bachelor's degree	11
	Master's degree	3
	Total	18

The demographic composition of the participants by gender and education is shown in Table 1. Ten of the 18 participants purposively selected for this study were men, and eight were women. Within the study were two undergraduates, two postgraduate diploma holders, 11 bachelor's degree holders, and three master's degree holders.

Table 2

Participants' Demographics

Participant	Age	Gender	Civil status	Tribe	State	Level of education	Religion
001	38	Male	Married	Tiv	Benue State	Bachelor's degree	Christian
002	43	Male	Married	Kuteb	Taraba State	Master's degree	Christian
003	38	Male	Married	Gbagi	FCT-Abuja	Bachelor's degree	Christian
004	35	Female	Married	Idoma	Benue State	Bachelor's degree	Christian
005	25	Female	Married	Ibo	Enugu State	Bachelor's degree	Christian
006	29	Female	Single	Oro	Akwa Ibom State	Post graduate diploma	Christian
007	45	Male	Married	Jukun	Taraba State	Master's degree	Christian
008	25	Female	Single	Ibo	Anambra State	Undergraduate	Christian
009	36	Female	Single	Igala	Kogi State	Bachelor's degree	Christian
010	25	Female	Married	Bajjuu	Kaduna State	Bachelor's degree	Christian
011	36	Male	Married	Gbagyi	FCT-Abuja	Postgraduate diploma	Christian
012	37	Male	Married	Mada	Nasarawa State	Bachelor's degree	Christian
013	38	Female	Married	Gwandara	FCT-Abuja	Bachelor's degree	Christian
014	36	Male	Married	Itsekiri	Rivers State	Bachelor's degree	Christian
015	35	Male	Single	Birom	Plateau State	Master's degree	Christian
016	36	Male	Single	Jukun	Taraba State	Undergraduate	Christian
017	43	Female	Married	Anang	Cross River	Bachelor's degree	Christian
018	39	Male	Single	Urhobo	Delta State	Bachelor's degree	Christian

The demographic distribution of the 18 participants is detailed in Table 2. Twelve of the participants were married, six were single, and the participants' ages ranged from 25 to 45. They were all Christians.

Data Collection

As discussed in Chapter 3, under the role of the researcher, I conducted data collection using a semistructured interview guide to interview the volunteered participants. Other sources of data collection included peer-reviewed literature on the study phenomenon, notes taken during interview proceedings, and reflective journals.

Participant Selection and Interview Conduct

I employed purposive and snowballing selection strategies to select the 18 consenting participants out of the 28 recruited for this study. I used a semistructured interview guide to conduct the interviews. The suggested number of participants to be interviewed was 10 to 16. However, during data collection, I observed a new trend in the interview evidence, which informed my decision to increase the number of participants by two, making a total of 18 participants interviewed to gain more information for the study. According to Saunders et al. (2018), saturation refers to the number of interviews needed before no novel information emerges or is obtained via recruiting additional participants.

Therefore, data saturation is attained in interviews when the researcher hears the same statements repeatedly. Then, instead of continuing to gather data, it is time to begin analyzing what has already been gathered (Jackson et al., 2015; Middlemiss et al., 2015). I interviewed the selected volunteers via Zoom internet phone conversations. Each volunteer's preferred schedule (day and time) was observed for the interview, and no participant was interviewed more than once. Each participant spent, on average, 40 minutes in the interview. The interview transcripts for the data were recorded using an

electronic audio recording device. After every interview, I saved the audio transcriptions to my laptop and turned them into written transcripts using Microsoft Word's transcribe feature.

Data Analysis

After transcribing the audio of the interviews, I cleaned the data by carefully reading the transcript while listening to the audio. I corrected any misspelled or omitted words likely caused by the study participants' dictation and pitching. I correctly labeled the participants from 001 to 018 using identifiers, then entered the transcribed texts into the NVivo qualitative data software Version 14 and started the data analysis. To identify participants' most frequently used words in the interview, I ran a word query of 100-word frequency on the data (see Figure 1). After that, I carefully examined the RQs for the study and each item (question) on the semistructured interview guide.

I determined overarching themes from the data, which helped me respond to the RQs in the study. In analyzing the data, I created themes in responding to the study questions, which include the following perception on COVID-19 disease, symptoms of COVID-19 disease, personal experience on COVID-19 disease, others' experience on COVID-19 disease, perceptions on the effectiveness of COVID-19 disease, herbal medicine for treating COVID-19 disease, individual preference for treating COVID-19 disease, knowledge influencing hesitancy to COVID-19 vaccine uptake, sociocultural factors influencing hesitancy to COVID-19 vaccine uptake, attitude influencing hesitancy to COVID-19 vaccine uptake, and other factors influencing hesitancy to COVID-19 vaccine uptake.

To code the data in the NVivo software, I studied the key insights that the participants gave that related to the overall themes that had previously been identified from the careful examination of the data and the RQs. I generated the codes under each overarching subject to the NVivo software, which I afterward clustered into categories to aid in providing succinct discussions under each overarching theme in addressing the RQs. The study produced the following emergent themes: culture, family and friends, religion, personal decision, chips to control humans, conspiracy theory, death, health concerns, infertility, the attitude of healthcare workers, ineffectiveness of the vaccine, the vaccine production time, fraudulent or corrupt practices, and unavailability and inaccessibility to the vaccine. Figure 2 shows the thematic word cloud.

Figure 2

Thematic Word Cloud

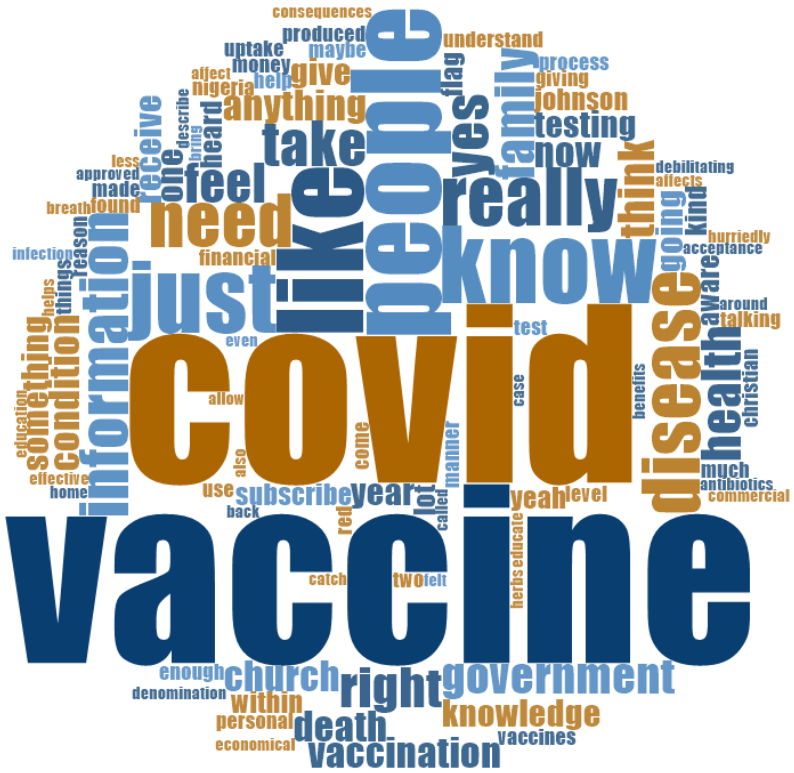


Figure 2 shows a word cloud generated from the most frequently used words and phrases in the data set. The word cloud provided a visual representation of the key themes and concepts that were discussed by the participants. These were the most frequent words that participants' responses focused on when discussing their reasons for being hesitant to get vaccinated against COVID-19. The word cloud reveals that keywords include COVID-19, vaccine, knowledge, disease, government, church, people, health, antibiotics, commercial, and family. This suggests that these words or factors played an important role in the participants' hesitation to get vaccinated against COVID-19 disease. These words provide deeper insights into the common topics discussed in the interview

proceedings. The insights from the word cloud were used to identify the most important factors that contribute to knowledge, attitude, and hesitancy to COVID-19 vaccination uptake in Nigeria. The information from the word cloud was used to develop themes in answering the study RQs and develop initiatives to address hesitancy towards COVID-19 vaccination in Nigeria. This information helped to improve public health messaging about COVID-19 vaccination or to develop interventions to address vaccine hesitancy.

Evidence of Trustworthiness

Guba and Lincoln proposed the trustworthiness criterion as a perfect and continuous benchmark for assessing the reliability of qualitative research. They suggested using four criteria: credibility, transferability, dependability, and confirmability, to determine whether the study was trustworthy (Guba & Lincoln, 1985).

Credibility

Credibility is a term used to describe the truthfulness and accuracy of study findings. It has to do with whether the research conclusions are appropriate considering the data collected, considering the volume, quality, and variety of data gathered. It assesses the extent to which the researcher's biases are reduced during the data collection and analysis so that the data accurately reflect the study's findings (Ghafouri & Ofoghi, 2016). A study's credibility can be established through a variety of techniques, including prolonged engagement, persistent observation, member and external checks, triangulation, contrast or divergent cases, and research credibility (Nowell et al., 2017).

In establishing credibility for this study, I used prolonged engagement to develop a good rapport with the study participants that made them felt at ease during interviews

and become absorbed in the interview process, which enabled them to give truthful answers to the questions. I used the data triangulation method to combine data gathered from interviews, direct observations, and literature reviews to convey the study's findings. I carried out member checking by asking the study participants to confirm the accuracy of the information supplied. I conducted this by clarifying each participant's information to ensure their points of view were well-expressed before wrapping up the interviews. I additionally studied peer-reviewed literature to strengthen the context and justification of the participants' attitudes, behaviors, and perceptions of the study phenomenon. Also, my research chair and a committee member carefully analyzed the findings during periodic debriefings.

Transferability

Transferability denotes that a study's findings are consistent with results from similar situations and that the research's results will be appropriate for use in the future. Transferability states that the precise research approach may be applied to data collection, coding, categorization, and presentation in a thematic analysis in another setting (Lietz & Zayas, 2010; Streubert & Carpenter, 2014; Adib et al., 2013). To achieve transferability in this study, I detailed the research methods in-depth to make it easier for future researchers to replicate them in a different setting. I made sure that the study results were concisely explained based on evidence, enabling future researchers or readers to draw enough conclusions from the study and/or apply them to another study. I also provided evidence of transferability by linking the theoretical framework of the qualitative

phenomenological approach to the RQs and verifying that the problem statement, the objective of the study, the RQs, and the research design conform.

Dependability

Tobin and Begley (2004) stated that to achieve dependability, the researcher must ensure the research process is rational, traceable, and thoroughly documented. This will enable researchers to evaluate the research process and assess the study's dependability. I established dependability for this phenomenological research by combining the data gathering and analysis steps. I gave a thorough explanation of the data collection process and the thematic analysis used to produce the findings of the study. I ensured that the study's trustworthiness requirements were all satisfied by basing the study's findings on the data gathered so that they would yield the same results and interpretations if another scholar had conducted the data collection and analysis.

Confirmability

Confirmability focuses on proving that the researcher's findings and interpretations are drawn from the data, necessitating a justification for the researcher's conclusions and interpretations (Nowell et al., 2017). According to Guba and Lincoln (1989), confirmability is established when credibility, transferability, and dependability are all achieved. I promoted confirmability by eliminating my opinions or prejudices from the study's data and results so that they were not influenced by my bias. In a similar vein, I showed confirmability by making sure that the qualitative study's findings and meanings were completely grounded in the data collected, rather than my beliefs.

Results

After carefully reviewing the RQs, I discussed the study's findings by presenting the major themes that emerged from the data. The main topics and emerging themes from the findings are presented logically in Table 3. Each participant's identification in each overarching or emergent study is described in the files, along with the participant who provided the findings. The references allude to how frequently each overarching or emerging theme has been supported by evidence.

Table 3

Overarching Themes and Emergent Themes

S/N	Overarching theme	Emergent theme	File	Reference
1	Perception on COVID-19 disease	Government fraud, hoax, man-made condition, fake, malaria	7	10
2	Symptoms of COVID-19 disease	Fever, respiratory problems, coughing, chest pain, generalized body pain	16	20
3	Personal experience on COVID-19 disease	Denied existence, not affected, malaria	9	13
4	Others experience on COVID-19 disease	Debilitating disease, fake, malaria	7	8
5	Perceptions on the effectiveness of COVID-19 vaccine	Prevention, in denial, poison, lack of trust	10	15
6	Herbal medicine for treating COVID-19 disease	Moringa, bitter leaf, neem.	17	19
7	Individual preference for treating COVID-19 disease	No vaccine, prayer, church deliverance, antibiotics, boil leaves & drink	15	25
8	Knowledge influencing hesitancy to COVID-19 vaccine uptake	Form of control, fraud, experiment	14	17
9	Sociocultural factors influencing hesitancy to COVID-19 vaccine uptake	Culture	16	18
		Family and friends	12	14
		Religion, jobs	18	33
10	Attitude influencing hesitancy to COVID-19 vaccination uptake	Personal decision	4	4
		Awareness, overseas travel	13	20
11	Other factors influencing hesitancy to COVID-19 vaccine uptake	Chips to control humans	4	4
		Conspiracy theory	6	8
		Death	6	8
		Health concern	6	9
		Infertility	4	6
		Attitude of healthcare workers	3	9
		Ineffectiveness of the vaccine	7	14
		The vaccine production time	3	8
		Fraudulent or corrupt practices	4	6
		Unavailability and inaccessibility to the vaccine	7	12

The Central RQs and Overarching Themes

The overarching themes that emerged from the data were based on the HBM framework in conjunction with the qualitative IPA to develop the three central RQs and the semi-structured interview questions. Using the HBM and the IPA, I addressed the three main RQs of the study by discussing how the theories are interrelated with the overarching and emergent themes related to knowledge, attitudes, and hesitancy toward COVID-19 vaccination uptake in Nigeria. The findings were discussed under each overarching and emerging theme in a block quote for verbatim responses longer than 40 words and in quotation marks for those shorter than 40 words.

RQ1: What is the relationship between COVID-19 knowledge and COVID-19 vaccine hesitancy among the unvaccinated population between the ages of 18-60 years in Nigeria? In addressing RQ1, I generated four overarching themes by conducting a thematic and IPA of the data collected. The themes are perceptions on COVID-19 disease, symptoms of COVID-19 disease, personal experience with COVID-19 disease, and others' experience of COVID-19 disease. These overarching themes succinctly answered the perceived susceptibility, perceived severity, and perceived severity domains of the HBM.

Overarching Theme 1: Perception of COVID-19 Disease

Participants shared a variety of viewpoints on the COVID-19 disease and its highly contagious characteristics, which contributed to its global spread and declaration as a pandemic, especially in the Nigerian environment. This finding aligns with the perceived susceptibility and perceived severity domains of the HBM. Within this context,

during the interview, Participant 001, a male from Benue state, on his perception of COVID-19 said to me, "My understanding is that COVID is an advanced stage of respiratory infection." Participant 010, a female from Kaduna State, viewed this disease, as "COVID-19 is a very deadly disease. It has affected and killed many people, especially those of young age and those from the age of 50 and above. That is what I know about it."

Participant 015, a male from Plateau State, indicated, "It is a disease that affects the breathing capacity of humans." Participant 017, a female from Cross River shared a similar opinion, stating, "COVID-19 is an infectious disease caused by acute respiratory syndrome. COVID-19 is a normal flu and fever that attacks Nigerians full force" during our one-to-one internet interview.

Participant 002, a male from Taraba State, knowledgeable about the origin and his perception told me:

> In 2019, a new COVID-19, or COVID coronavirus, was identified, the cause of it is happenings that originated in Wuhan, China in 2019. That is why it is called COVID-19 because it erupted in 2019. So, I said COVID-19 is a coronavirus, just like other diseases, as that is a family of viruses. It is an infectious disease that can spread through body fluids and contact with infected surfaces. COVID-19 can cause illnesses such as the common cold, severe acute respiratory syndrome, and Middle East respiratory syndrome.

Participant 005, a female from Enugu State, believes COVID-19 is fatal explained to me:

> COVID-19 is a deadly disease that has affected and killed many people, especially those aged 50 and above. It kills them faster than from 50 below. For individuals this age, their immune system is not strong enough to fight the disease, so they tend to die quicker than younger persons. Those of this age hardly survive this disease because of the immune system's weakness.

Participant 006, a female from Akwa-Ibom State, aware of the infectious nature of the disease during the interview, explained to me:

> Ah, yes, yes, yes, I have heard a lot about the disease. It is an infectious disease that can kill someone if not resolved. The disease can infect another person if you do not observe the distance or do other things. I heard it was scary. So, it is a perilous disease that needs the most care.

An in-depth look into the thematic findings revealed to me that participants had a high perceived susceptibility to COVID-19 disease because they believed that respiratory infection is highly contagious. This aligns with the perceived susceptibility of the HBM. Perceived susceptibility argues that if a person has personal experience with COVID-19 or knows someone who has had the disease, they are more likely to believe that they are at risk of developing the disease. Also, participants had a high perceived severity of the disease because they believed that the disease was serious and could kill people. This is consistent with the perceived severity of HBM. Perceived severity posited that if a person knows someone who has had a serious case of COVID-19 or who has died from the disease, they are more likely to believe that the disease is serious.

Overarching Theme 2: Symptoms of COVID-19 Disease

As I mentioned in overarching Theme 2 above, the interviewees described various COVID-19 disease symptoms based on their opinions, observations, and experiences in their community or information they learned about the pandemic's prevalence in the global village. The participants' experiences revealed their perceived severity of the symptoms of COVID-19 disease and these perceptions connected to the perceived severity of the HBM. According to the participants, Participant 011, a male from FCT-Abuja, "Headache, high temperature, sore throat, and continuous coughing are COVID-19's symptoms." Participant 001 noted COVID-19 symptoms include, "Loss of your sense of smell and shortness of breath." Participant 010, a female from Kaduna State, said to me, "Okay, COVID-19 has many symptoms that I know of; the person is sick, and you feel feverish mm-hmm. You have a dry cough and a general body weakness."

Participant 012, a male from Nasarawa State, observed during the interview "The symptoms include fever, cough, difficulty in breathing, and lethargy." Participant 013, a female from FCT-Abuja, stated to me, "COVID-19 was a deadly disease characterized by fever, coughing, shortness of breath and mostly killed the elderly people." Participant 014, a male from Rivers State shared with me that the symptoms include a "rise in temperature, fever, dried throat, cough, headache, difficulty breathing, and general weakness of the body."

While responding to questions during the interview on symptoms, Participant 015, a male from Plateau State, claimed, "The symptoms include coughing, fever, sneezing, and respiratory impediment. Its symptoms are common ailments combated with herbs for

hundreds of years through local medication or therapy." Participant 016, a male from Taraba State, further stated, "I know as much information that the media has made available to the public, one of the symptoms of COVID-19 disease I know is difficulties in breathing." Participant 017, a female from Cross River State, agrees with this line of reasoning stating, "The symptoms are headache, fever, and cough." Participant 018, a male from Delta State, shares similar thoughts by pointing to "cough, sneezing, body weakness, sour throats, fever, breathing difficulty, diarrhea, death" as the symptoms of COVID-19."

In a similar move, Participant 003, a male from FCT-Abuja, during an interview gave his opinion on symptoms, "Okay, COVID-19 to the best of my knowledge is a deadly disease that is characterized by fever, coughing, and shortness of breath; it mostly kills elderly people." Participant 004, a female from Benue State during the interview process likens the symptoms to malaria, "I looked at it; it's just a little bit, maybe like malaria, because most of the symptoms are not too far from malaria symptoms, except for difficulty in breathing which I saw on TV." Participant 009, a female from Kogi State, believes COVID-19 is problematic, "It is just that COVID-19 causes a lot of health problems. You feel dizzy and do not feel like eating and then you know, just okay, you feel internal cold and all that malaria, especially." Participant 006, a female from Akwa-Ibom State, shared her thoughts on symptoms:

> They start coughing, constant coughing, and sometimes they feel cold, which comes with fever. Furthermore, there was a time I read somewhere that somebody had an issue with difficulty breathing. So, these are the few ones I know for now.

Participant 002, a male from Taraba State, during the interview, shared typical symptoms:

> We have typical signs and symptoms of COVID-19, such as fever, cough, and tiredness. When you see these early symptoms, that is to say, yeah, you are prone to COVID-19. People usually say COVID-19 when you contact it; just like the symptoms I mentioned earlier, we experienced this headache and constant fever, lung disease, and asthma. These are signs that one is infected with it.

Participant 005, a female from Enugu State, explained to me how to identify symptoms:

> For you to be able to know that somebody is affected by this disease, is when you come in contact with someone that has general weakness of the body, nasal congestion, and dry cough, coughing consistently, but there is nothing to throw away, and fever.

Participant 008, a female from Anambra State aware of symptoms and transmission mode asserted,

> Yes, I know it comes with fever and then it is easily transmittable by air. Most of the symptoms of COVID-19 are like those of malaria. Sometimes it is not discovered early because most people think it is just normal malaria when it starts until they must go for checkups in the hospital before they are sure that it is COVID and not malaria they are having. This is because the symptoms are mostly headache, cough, difficulty in breathing, and fever chills.

Insights from the transcripts revealed to me that participants were able to recognize a variety of COVID-19 symptoms, including fever, cough, shortness of breath,

breathing difficulties, headache, loss of smell, and fatigue. Based on the HBM Concept, the participant's awareness of the symptoms of COVID-19 disease can influence their perceived severity of the disease. According to the perceived severity of the HBM, if participants believe that COVID-19 can cause a range of serious symptoms, they are more likely to take steps to protect themselves from the disease. For example, Participant 013 informed me that COVID-19 is a deadly disease that mostly kills elderly people. This perceived severity of COVID-19 may motivate the participant to get vaccinated and take other precautions to avoid contracting COVID-19 disease. However, I must take into consideration that other factors, such as personal experiences and exposure to false information, can influence the participants' perceived severity of COVID-19.

Overarching Theme 3: Interviewees' Experiences on COVID-19 Disease

Few interviewees had agreed during interview sessions that they had recently experienced COVID-19 disease, while a few others contended that they had never experienced COVID-19 disease or were not consciously aware that they had. Participants claimed that the COVID-19 disease did not feel like malaria or any other disease they had ever known or experienced. They maintained it was difficult to articulate how the disease made them feel, but it was clear that it did not feel right. On the other hand, I deduced from their suggestions that COVID-19 had significant potential to end someone's life and did feel like a fever. This finding is connected to the perceived susceptibility and perceived severity domains of the HBM.

To substantiate these findings, Participant 009, a female from Kogi State on personal experience informed me, "The experience I had is that it kills very quickly, and then it

comes like fever and then cold and then loss of appetite, and it is dangerous.” This participant sounded distressed over her experience. Participant 001, a male from Benue State, appeared taken back by the disease stating:

> COVID-19 took me by surprise. It did not feel right, but it did not feel like I did not know it. It did not feel like malaria. It did not feel like a disease. It felt a lot like, and I am still looking for the right word.

Contrastingly, Participant 002, a male from Taraba State on personal experience denied contracting COVID-19, "I have never contracted COVID-19 before." The participant claimed, "No, I have not been infected, and I have not met anybody that has been infected either. So, I do not have any personal experience." Participant 004, a female from Benue State, denied, "No, no, no, no, I think I have never had close contact with someone that has been affected or contracted COVID-19." Participant 005, a female from Enugu State has no personal experience, "COVID-19 has not infected me." Similarly, Participant 010, a female from Kaduna State, claimed personally, “I have not been affected personally or had anyone close to me affected by the disease. I have not had someone who contracted it, but I believe the disease does not like a hot environment, which prevents you from contracting it."

The findings from the data I collected suggested that some participants have had personal experience with COVID-19 or know someone who has had the disease, while others have not. In connection to the HBM, the findings are most relevant to the perceived susceptibility and perceived severity domains of the HBM. Concerning

perceived susceptibility, the findings suggest that some participants have a high perceived susceptibility to COVID-19 disease, while others have a lower perceived susceptibility.

Looking at Participant 009 for example, who has had personal experience with COVID-19, he is likely to have a high perceived susceptibility to the disease. Participant 002, on the other hand, who has not had any personal experience with COVID-19 and does not know anyone who has had the disease, is likely to have a lower perceived susceptibility to the disease. For the perceived severity, the findings of my study suggest that participants generally perceive COVID-19 to be a serious disease. For example, Participant 009 describes COVID-19 as being "dangerous" and says that it "kills very quickly" while Participant 001 describes COVID-19 as being a "disease" that did not feel right."

Overarching Theme 4: Others' Experience With COVID-19 Disease

During my one-to-one interviews with participants, the majority denied having personally experienced COVID-19 and had not seen, heard, or read about the disease from the perspective of others. However, they questioned whether these individuals contracted COVID-19 disease and, as a result, think they mistook malaria or other infections for COVID-19 diseases. Others concurred that they did, in fact, contract COVID-19 disease, were treated for it, or were negatively affected by it. Others claimed that COVID-19 primarily infected the haves, or the wealthy, who had been abroad and contracted the disease before coming home, which ultimately caused their deaths. Different views and experiences abound succinctly aligning with the perceived severity of the HBM.

Concerning these findings, Participant 001, a male from Benue State, said to me, "Yes, I have never really met anybody that had COVID-19. I heard many things about COVID-19, about people that had COVID-19 or said to have COVID-19 disease." Participant 013, a female from FCT-Abuja, about individuals that contracted COVID-19, shared, "I felt they were suffering from malaria, cold or cough, not COVID-19, so they should be treated as such." Participant 014, a male from Rivers State, said, "The infected woman felt malaria symptoms and weight loss, they prayed for God's miracle and asked to be treated for common malaria. We never believe he/she will die of it."

Participant 015, a male from Plateau State, in fear, shared, "I consider COVID-19 to be a dreaded and fearful or scary experience, as such would not want to have or associate myself with it." Participant 016, a male from Taraba State, shared "The experience of someone I know is that of being scared, she was so scared. She looked it up on the internet for symptoms, then she was on her way to the hospital the next day." Participant 006, a female from Akwa-Ibom State admitted being less knowledgeable to me, "I do not know, but I have someone that was infected. The person was quarantined, and I did not visit because I was so scared of contracting COVID-19."

Participant 002, a male from Taraba state, explained how some persons became infected:

> It is going down there to meet people that make others contract COVID-19. This is why we were isolated and those symptoms mentioned. The symptoms that were happening to them are associated with normal fever in Africa, especially in Nigeria.

Participant 003, a male from FCT-Abuja, adamant COVID-19 is non-existent explained to me during the interview:

> I have heard of people who got infected, but I have not had someone very close to me who has it. They suffered from malaria, cold, or cough, but not COVID-19. Moreover, they received the same treatment for malaria patients and others recovered. So, it was cold, malaria, or something else worrying them.

Participant 006, a female from Akwa-Ibom State, downplays the seriousness of COVID-19 infection in response,

> Apart from my thoughts, this noise about COVID-19 may not be as dangerous as we think. Though I followed all the measures, most of the infected people were flying from abroad and returning home. Some even came back and died from this kind of thing. So, the sickness is not rampant here. It could be rampant in other states, but not here.

Participant 004, a female from Benue State, conversant with COVID-19 explained to me,

> I know someone who has experienced it. Okay, somebody in Konshisha local government, a Tiv-speaking area of Benue State, in 2020. What he went through for weeks was severe, even more than the COVID we are talking about, because he lost his taste and sense of smell. He was coughing a lot, a dry cough for many days, close to one month. He took medications, stopped drinking cold water, and everything went off. He was not quarantined because he never believed it, and I just laughed. I think I was working with an NGO based explicitly on HIV. However, COVID-19 was just skeletally introduced into the program before I left.

> I just listened to the person, I chuckled, and I left. My little experience flashed into my head because I wondered why he was not quarantined. He was not taken to any COVID-19 First Response designated hospital. I advise him not to take anything cold because he has a dry cough. I found myself talking to him without a face mask.

The major points in the findings relating to Question 1 were that participants' perceptions of COVID-19 severity were influenced by their personal experiences and the experiences of people they know. This connects to the perceived severity domain of the HBM. The HBM states that people are more likely to take action to protect their health if they believe that the disease is serious. In the findings, several participants mentioned that they had not personally met anyone who had COVID-19, or that they knew people who had COVID-19 but who only had mild symptoms. This suggests that these participants may have a lower perceived severity of COVID-19 than people who have had personal experience with the disease or who know people who have had serious cases of COVID-19. The findings also suggest that participants' perceptions of COVID-19 severity were influenced by the misinformation that they had encountered. For example, one participant shared with me that she had heard COVID-19 was not as dangerous as people think; while another participant said he had heard COVID-19 was only a serious problem in other countries. This misinformation can lead to people having a lower perceived severity of COVID-19, which can make them less likely to take action to protect themselves from the disease (hesitate towards COVID-19 vaccination uptake).

RQ2: What attitudes to COVID-19 vaccination can influence vaccine hesitancy among the unvaccinated population between the ages of 18-60 years in Nigeria? To answer RQ2 and provide evidence for the HBM, I developed three overarching themes from the thematic and IPA of the data collected from the participants. These include perceptions on the effectiveness of the COVID-19 vaccine, herbal medicine for treating COVID-19 disease, and individual preference for treating COVID-19 disease. These overarching themes connect with the perceived susceptibility, perceived severity, perceived barriers, perceived benefits, cues to action, and self-efficacy domains of the HBM.

Overarching Theme 5: Perceptions of Effectiveness of COVID-19 Vaccine

I found contradicting evidence of claims over the efficacy of the COVID-19 vaccine. One theory claims that COVID-19 vaccination is worthless since it mysteriously kills infected individuals and those who received it for preventive purposes, regardless of how many shots they received. Another group of interviewees said that receiving the vaccination made no difference for those who received it and those who had not; therefore, those who received it still later encountered the virus, and some got infected again. These findings provide evidence of the participants' cue to action on COVID-19 disease as grounded on the HBM. This finding is connected to the perceived severity, perceived barriers, and perceived benefits domains of the HBM. Within this context, Participant 011, a male from FCT-Abuja mentioned mysterious deaths as I interviewed him, "All the people I watched on TV that gave testimonies about the vaccine complained of the mysterious death of victims that took the vaccine."

Upon response, Participant 012, a male from Nasarawa State, stated,

> Some who were vaccinated still died of the disease, and the number of jabs (vaccine shots) required for protection is uncertain; my personal belief is that the vaccine does not elicit the required protection against the COVID virus." The participant suggested the vaccine needed improvement, stating, "I believe that the vaccine needs further research work since several jabs (shots) are required for protection and some still die after receiving the COVID-19 jabs (shots).

Participant 007, a male from Taraba State, believes the vaccine lacks significance pointed out to me,

> No, whether you are vaccinated does not stop you from giving, contacting, or even dying. Why do we still need the COVID-19 vaccine? Even though some people here have gotten the vaccine, including health workers, they still get infected and transmit COVID-19 to others, as it cannot upset the infectious disease cycle. You still wear your face mask, wash your hands, keep your distance, and what have you, which is the issue. Yes, I have a colleague who took the vaccination. I provided the names of the major manufacturers: Modena, Pfizer, and Johnson and Johnson? I do not know which one he took, he responded. He died shortly after taking the vaccine. The guy was hypertensive before, but he took the vaccine regardless.

Participant 013, a female from FCT-Abuja, who is anti-vaccine said to me,

> I know of people who received it, but I do not see any significant positive difference between them and myself, so I still feel the vaccine given was just

> unnecessary." The participant added, "It is not effective because I heard of people who were vaccinated but still contracted COVID-19.

Participant 017, a female from Cross River State, declared during questioning to me: "Almost all who took the vaccine had one side effect or the other. Yes, the COVID-19 vaccine may be effective on others but not all Nigerians."

Opposing this view, Participant 015, a male from Plateau State, retorted, "All skepticism about vaccine adverse effects are myths. Nobody died. No antichrist. No adverse effects on their health." Participant 009, a female from Kogi State, said, "Yes, many people complained of dizziness after they have been vaccinated. They feel weak and see that it is not just acceptable, but they do it for their safety." During an interview with Participant 006, a female from Akwa-Ibom State, pro-vaccine denied side effects said to me,

> To some people who have tried to take the vaccine, they said it works. Here in Akwa Ibom State, right during that COVID-19 period, more than four, five, or six deaths were recorded from COVID-19. Some of those families lost their loved ones. Some infected persons were rushed to COVID-19 designated centers where they were quarantined. So, most people who took the vaccine have confirmed the vaccine is working well. There was a time when something popped up online, someone said that after being injected with the vaccine, whether he or she was feeling dizzy. That was the first set of vaccines they have removed. This other one they are giving to people has no side effects. People still do their thing usually, take it, and walk normally.

Participant 008, a female from Anambra State, however, admitted mild side effects:

> Someone I know who took the vaccine did not complain of anything, particularly harmful, but they said they experienced some changes in their body, but it was not for long. It was just like for a short period, they noted changes, and then soon they adjusted to their routine. Okay, they said they felt nauseous sometimes and dizzy and tired most of the time after taking the vaccine for two to three days.

The major point in these findings is that many participants had concerns about the safety and effectiveness of the COVID-19 vaccine. These concerns were based on personal experiences, anecdotal reports, and misinformation. These concerns are relevant to the perceived severity, perceived barriers, and perceived benefits domains of the HBM. Concerning the perceived severity, some participants expressed concerns that the COVID-19 vaccine is not effective because they know people who have been vaccinated but still contracted COVID-19. Others expressed concerns about the safety of the vaccine, citing reports of side effects and even death. For the perceived benefits, some participants questioned whether the benefits of getting vaccinated outweigh the risks. They pointed out that people who were vaccinated can still contract COVID-19 and that the vaccine requires multiple doses. Also, the perceived barriers reflected in some participants' concerns about the side effects of the vaccine. Some participants questioned whether the benefits of getting vaccinated outweigh the risks. This indicated that perceived barriers towards the COVID-19 vaccine are not related to physical or logistical barriers. It is associated with psychological barriers, such as fear of pain or anxiety about the unknown.

Overarching Theme 6: Herbal Medicine for Treating COVID-19 Disease

The majority of the individuals that I surveyed were aware that COVID-19 disease patients might be treated with herbal therapy. Some of the participants claimed to be knowledgeable about the use of herbs, others had only heard or read about them. They gave me assurance in herbs' potency to work well. Examples of unique herbal plants utilized for treating COVID-19 sicknesses mentioned were the neem tree, Dongo yaro (Moringa), and Ogogoro (local gin). The participant's justification for using herbs to treat COVID-19 was that the condition shared symptoms with malaria, which several of these herbal medicines were well known to be effective at treating. Only a few participants thought otherwise. They claimed to be unaware or did not know any herbs for treating COVID-19. These findings are relevant to the perceived benefits and cue-to-action domains of the HBM.

As evidence of these findings, Participant 012, a male from Nasarawa State, mentioned, "Neem leaves were used during the outbreak, but I cannot ascertain the efficacy." Similarly, Participant 013, a female from FCT-Abuja, attested to me about the use of herbs:

> I know of neem tree and bitter kola," Participant 014, a male from Rivers State, added that "concussion (combination of multiple fresh leaves) that heals malaria fever from local herbs is convenient and abundant, unlike vaccine that you must travel some kilometers, then queue to get. In the long run, you will be stigmatized.

Participant 015, a Plateau State male, confirmed to me, "Yes, I am aware of some herbs like moringa leaves, "Dogon yaro" leaves, mango leaves, and guava. They are

boiled and steamed, then consumed to cure COVID-19." Participant 017, a female from Cross River State, supported this view, adding, "Yes, I have heard about many herbs that cure COVID-19 in Nigeria." Participant 018, a male from Delta State, added "The homemade medication for COVID-19 is ginger soaked in warm water."

Participant 002, a male from Taraba State, in agreement, assures herbs:

> To me, so many herbs can be taken to kill COVID-19. For instance, we have a tree called Dogon yaro. I need to find out its name (Dogon yaro) in English. Furthermore, we have ginger, which you can boil as well, or whatever trees or leaves you can take to do away with the fever that one is talking about here. We do not know much about the vaccine we are told to take, which makes it difficult to accept. As mentioned earlier, taking our local gins here can do away with COVID-19, a usual way of treating malaria. We take things like bitter grass, Ogogoro (Local Gin), and Dogon yaro (Moringa). If you have a slight fever and put these things in place, your fever will be gone, and it applies to what they call COVID-19 because the symptoms are the same. So, applying the same method used to treat malaria also goes a long way in providing a cure for COVID-19. Thus, there is no need to be afraid.

Participant 003, a male from FCT-Abuja, on the use of herbs in treating COVID-19:

> Around my neighborhood, some people boasted of treating themselves when sick. Some said they took a tree leave called Dogon yaro, while some indicated Bitter kola. They claim they both work for them in treating the symptoms because the symptoms are like those of COVID-19. I have not contracted COVID-19, used

herbs, or knew much about herbs. I have, however, heard only of the Dogon yaro leaves.

Participant 004, a female from Benue State, upon inquiry from me, denied contact with herb users saying “No, I have not had contact with someone who took herbs, but I heard people saying that taking malaria drugs or typhoid herbs will clear the infection. I have heard about it, but I have never experienced it.” Participant 001, a male from Benue State, stated, "I am not specific, but I have heard that people do their stuff, and it goes away, maybe It's just rumors going around." Participant 010, a female from Kaduna State, asserted, "I have not seen it, but I have heard that some people gather different leaves because they believe that it kills COVID-19. The leaves can be more deadly than the first thing (vaccine) that we are refusing to take."

However, Participant 016, a male from Taraba State denied the use of herbs for treating COVID-19, "I am not aware of any herbs or homemade medications." Participant 005, a female from Enugu State, commented, "No, I am not aware of any herbs." Similarly, Participant 006, a female from Akwa-Ibom State, said, "Oh, I have never heard of any herbs." Participant 007, a male from Taraba State, also re-echoed the same thoughts mentioned above "No, I have not heard of any herbs."

I found these findings relevant to the perceived benefits and cue-to-action domains of the HBM. In consistency with perceived benefits, the majority of the participants were aware of the potential use of herbal therapy to treat COVID-19 patients. They based their belief in the potency of herbs on personal experiences, traditional knowledge, and the perceived similarity between COVID-19 and malaria. These

participants took herbs or homemade medications because they did not trust the COVID-19 vaccine or because they believed that traditional herbs were more effective. Others believed that traditional herbs are a safer alternative to the vaccine. In alignment with the cue-to-action domain of the HBM, some participants mentioned that they were hesitant to get vaccinated because they did not trust the vaccine or because they believed that traditional herbs were more effective. This suggests that the participants are more likely to get vaccinated if they are provided with more information about the safety and effectiveness of the vaccine, or if they are allowed to talk to a doctor about their concerns.

Overarching Theme 7: Individual Preference for Treating COVID-19 Disease

In the process of collecting data, I observed that the preferred treatment modality for COVID-19 disease varied among the interviewees. While a few participants chose alternative pharmaceutical treatment modalities such as antibiotics, some were adamant in their desire for the COVID-19 vaccine produced through intensive research efforts to prevent the infectious disease. Still, others disputed and refused the vaccine and opted instead for herbal remedies commonly used as homemade medicines. Their choice of herbs resulted from perceived worries about the COVID-19 vaccine's adverse effects, which scared them away from using it themselves or recommending it to anyone in their network who was ill. From the findings in this theme, I understood that participants' choice of treatment for COVID-19 disease is influenced by their perceptions of the risks and benefits of different treatments. Findings in this theme connect with the perceived

susceptibility and perceived severity, perceived benefit, perceived barrier, and self-efficacy domains of the HBM.

Succinct to this finding are participants' responses; Participant 001, a male from Benue State, when asked explained to me, "I think that is what I need. Okay, I would, how should I put it? Considering the condition of COVID-19 as an infection, I would not be hasty for vaccines but rather antibiotics. The strong antibiotics, not herbs." Participant 016, a male from Taraba State, opinion differed. He, without hesitation, responded "I have strong immunity and will handle the illness without a problem. Natural immunity (immunity after natural infection) is better than vaccine immunity."

Participant 003, a male from FCT-Abuja, had opinion deferred from participants that favor herbs or vaccines, he strongly advocated for medications from the pharmacy:

> Yes, I use many medications at the pharmacy when I am sick. There are good cough medications to take when you are suffering from a cough, so I will recommend you take medication for a cough. If you are suffering from malaria, I will recommend you take medication for malaria. I have not experienced any distinct symptoms that I can attribute to COVID-19, so I cannot recommend that someone go and take the COVID-19 vaccine.

Upon prompt from me, he continued,

> Okay, I know of some people who have received the vaccine. However, I have not seen any negative difference between them and myself. So, I feel that they should not have taken it in the first place, but I have not seen any positive or negative difference between those who took it and those who did not. The best

> control of COVID-19 disease has been given to us by the Almighty God, our Nigerian weather. Nigerian weather is hot enough to kill COVID-19. Take a walk under the sun, and you are free. So, that is the most effective control measure. COVID-19 will not be able to survive; from my little research about the COVID-19 virus, I know it cannot survive our weather.

Participant 012, a male from Nasarawa State, who is anti-herbs told me "I won't recommend homemade medication (herbs) for treatment since it may hurt the patient, and little is known about such herbs." Participant 017, a female from Cross River State, added, "I will not recommend the treatment of COVID-19 with herbs if at all it exists." Participant 008, a female from Anambra State, said, "No, I won't recommend the local herbs or take it because I'm not sure if it's like certified as a cure for the virus, so I would prefer taking the vaccine in a registered hospital."

Participant 009, a female from Kogi State, who is pro-COVID-19 vaccine, "Already the vaccine is out for us to prevent ourselves from being infected by COVID-19, so there's no need to take herbs to control COVID-19." Participant 018, a male from Delta State, looks favorably at vaccines as a form of prevention, and had this to say to me "Vaccination is the only control I could look at now because in Africa, we're always together, and no face masks, always together."

Participant 005, a female from Enugu State, also pro-COVID-19 vaccine vehemently said to me:

> No, I will not recommend herbs to anyone, and neither will I take it. So, I would not recommend it to anyone, not even my enemy. This is a foreign disease to

> Nigeria that later spread into the country. These people go to provide herbs, saying it kills the disease. They have yet to do their research to know the cause of this disease or what can cure it. I do not recommend any herb because it might cause more harm than good.

Meanwhile, Participant 010, a female from Kaduna State, declined the use of herbs:

> I would not recommend herbs to anyone because of COVID-19; this disease is not found in Nigeria. The people who have provided these herbs do not know the parts of the system in our body that are damaged, but they provide all these herbs for us to take. They do not know the side effects of the herbs. Thus, I will not take it, and I will not recommend anybody to take it.

Participant 011, a male from FCT-Abuja, an advocate of herbs, argued against taking medications for COVID-19. When I asked why, he explained, “I prefer homemade or herbal medicine because it is free from conspiracy theories. I do not believe in the vaccine. I firmly pledge my belief in the conspiracy against the vaccine. Hence, I cannot recommend it to anybody.” Participant 013, a female from FCT-Abuja, added, "I know of Neem tree and Bitter kola and would have recommended it to treat the symptoms which were the same with other common diseases in Nigeria. "Participant 014, a male from Rivers State, thought differently because he aligned with herbs, "Yes, I will recommend it." Participant 002, a male from Taraba State, pro-herb agreed on the use of herbs when I asked his preference, "Yes, it's easier to use herbs; it is easier than taking something you don't trust or you don't know the impact of, okay."

Participant 015, a male from Plateau State, pro-herb elaborated further if affected,

> I will take immediate precautionary measures like isolating myself or the infected victim and disinfecting contact areas. I believe in the local remedy or cure because most of the symptoms of the COVID-19 disease have been combated with herbs for thousands of years by my ancestors, even before the recent COVID pandemic in late 2019.

Participant 004, a female from Benue State, also pro-herb explained that herbs are an option,

> Supposing I know any effective herbs, in that case, I will ask for them because even with the malaria drug I have been taking, some medical practitioners advise people sick with malaria if the symptoms persist after undergoing treatment for several weeks without relief, may go for herbal remedies. So, when I completed a course on foreign medication, I took my time to observe the local help – herbs. It is almost six- or seven-months rundown, and I have not complained about malaria. So, for COVID-19, I think if I know an effective herb, I will advise whoever is infected to take it. I do not know of any, but I heard people saying it is super best.

Reflecting on the findings, I came across two main perspectives on the treatment of COVID-19 among the participants. The first group of participants favored the use of herbs and traditional remedies, while the other group believed that vaccines are the best way to prevent and treat the disease. The participants who favored the use of herbs and traditional remedies may have lower perceived susceptibility and perceived severity of COVID-19. They may also have lower perceived benefits of vaccines and higher

perceived barriers to vaccination. However, the participants who believe that vaccines are the best way to prevent and treat COVID-19 may have higher perceived susceptibility and perceived severity of COVID-19. They may also have higher perceived benefits of vaccines and lower perceived barriers to vaccination. In the extracts, Participant 004 female from Benue State expressed confidence in her ability to identify and use effective herbs for COVID-19 treatment. This suggests that the participant had high self-efficacy for using herbs to treat COVID-19. However, other participants expressed lower self-efficacy for using herbs to treat COVID-19. For example, Participant 015 male from Plateau State said that he would only recommend herbs to someone if he/she was sure that the herbs were effective. This suggests that they have lower self-efficacy for using herbs to treat COVID-19.

RQ3: How do sociocultural (education, occupation, religion, beliefs, culture, ethnicity) factors influence COVID-19 vaccination hesitancy among the unvaccinated population between the ages of 18 and 60 years in Nigeria? In addressing the third RQ, I developed four overarching themes from the thematic and IPA of the data collected. These include knowledge influencing hesitancy to COVID-19 vaccine uptake, sociocultural factors influencing hesitancy to COVID-19 vaccine uptake, attitude influencing hesitancy to COVID-19 vaccine uptake, and other factors influencing hesitancy to COVID-19 vaccine uptake. The findings relate to the perceived susceptibility, perceived barriers, self-efficacy, perceived severity, cues to action, and perceived benefits domains of the HBM.

Overarching Theme 8: Knowledge Influencing Hesitancy to COVID-19 Vaccine Uptake

Data collected by me during one-to-one interviews show divergent views from the perspectives of the interviewees on COVID-19 sickness has created misunderstandings over the willingness to get the COVID-19 vaccine, inconsistent results of the diagnosis of COVID-19 disease, and the nature and symptoms of the disease which were likened to malaria, among others. These reasons were advanced to influence reluctance in the uptake of the COVID-19 vaccine by the population. The reasons include their knowledge of the conspiracy theory that it was a chip to reduce the African population, the infectious nature of the disease (known as a foreign disease), the hot weather in Nigeria, which widely implied these incorrect beliefs about the COVID-19 disease, which are widespread and differing, unfortunately, continue to affect participants' decisions on vaccination. These findings relate to the domains of perceived susceptibility, perceived severity, perceived benefits, and perceived barriers of the HBM.

Within this context, Participant 004, a female from Benue State, clearly stated to me,

> Well, I know it is a virus, and my little understanding of this virus is that it is manufactured. That is what I understand about the virus. I had heard of the COVID-19 virus for a long time before the outbreak in 2019. At first, I looked at it as a conspiracy theory, but when I began to read and listen more as I watched television, I was convinced that the killer disease is actual. However, as an African for me, I believe in Orthodox so much. I began to study it and personally researched COVID-19 online to educate myself about it. That way, I will be able

> to make people know and convince others either to go for the jab (vaccine shots) or the typical treatment. However, I later discovered that COVID-19 is not more than what fever does in malaria. Thus, I advocate believing it is not higher than fever. So, whoever contracted COVID-19 or is diagnosed with high fever exhibiting symptoms, I still see it as a malaria infection that will clear off.

Participant 011, a male from FCT-Abuja, also a pro-conspiracy apologist said to me:

> COVID-19 is artificial. COVID-19 was introduced to control the population of humans, especially the third-world countries. COVID is part of the conspiracy theories, e.g., COVID-19 was created by the people in power, and to bring solutions to the virus, they can plant chips in humans by vaccinating them.

Participant 014, a male from Rivers State, anti-vaccine who favors the conspiracy theory commented, "COVID-19 does not thrive in African regions and hence cannot kill us. It is just a mere fever, and it is an orchestration of the Whiteman to reduce population and make money from the sales of vaccines." Participant 015, a male from Plateau State, posited that "The fever symptoms make COVID and malaria very similar. Most victims suspected to have had COVID-19 were mere malaria patients in Nigeria. Therefore, the cases of COVID-19 alarm were widely discredited as falsified or doctored figures." Participant 001, a male from Benue State, believes inconsistency in information dissemination has exposed the COVID-19 myth:

> Information received is contradictory because they would say today you have COVID, and tomorrow they test you do not have COVID. It was intentional misinformation, or we were not getting the testing right from the many people

> standing in the sun for testing. They miraculously find people healthy, and the same persons will suddenly test positive. Inconsistent information going back and forth felt wrong. The whole thing did not feel right, like HIV, as the testing results alternated. According to individuals in my community, individuals tested and found positive previously will be tested again in the next two weeks and found healthy without treatment, which confirms that COVID-19 is not a disease. The fluctuation in testing shows COVID-19 is just a condition you go through, and then you return to yourself.

Participant 017, a female from Cross River State, denies COVID-19 exists, she explained to me why stating, "The misconception about COVID-19 is that it is an imported disease and akin to malaria. I believe COVID-19 disease is not a disease for the poor but for cross-border travelers." Participant 012, a male from Nasarawa State, a conspiracy theory apologist shared similar thoughts, “Most people don't believe it exists, vaccines don't work, vaccines contain harmful chips."

Participant 018, a male from Delta State, believes conspiracy theory underscores the lethality of COVID-19:

> The misconception about COVID-19 is that it is the disease of White men. It does not survive in hot weather like in Africa, particularly Nigeria. It has similar symptoms to malaria, so it is not taken seriously. It is believed in Nigeria to be politically motivated and that it only survives in cold weather.

Participant 013, a female from FCT-Abuja, believed COVID-19 was artificially made and only prevalent among the rich, stating,

> COVID-19 was invented in the lab. Unlike malaria, COVID-19 is inaccurate in Nigeria because it has no distinct symptoms. We believe COVID-19 in Nigeria was and remains a "big man's" disease because it only affected the high-income class. So, the average person like me concluded that COVID-19 came to Nigeria to punish the rich. The vaccine was viewed as a tool for genetic variation or something else.

Participant 002, a male from Taraba State, categorized COVID-19 on the same level as malaria, symptoms and suggested ways of eliminating mosquitoes to me:

> Yes, we do not have what we call COVID here. Because the signs and symptoms of COVID are the same as the signs of malaria, look at it: COVID is the same. They may have brought another name to beautify it. I look at it as the same malaria in another way people call it because the signs and symptoms are the same. We still have muscle aches, chest pain, sore throat, running nose, headache, pink eye or conjunctivitis, nausea, vomiting, and diarrhea, similar symptoms associated with malaria. So, I am looking at COVID-19 in the same way as malaria. The misconception is when I see people twisting it around to get what they want.
>
> When a mosquito bites someone, the person will develop symptoms such as fever, which I do not see any difference with those of COVID-19. I said earlier that there is no difference between COVID-19 and malaria. It is the same symptoms you will see when someone is diagnosed with COVID-19. Many people believe the COVID-19 vaccine is a means of siphoning funds from the government or

money from individuals. This is substantiated by giving another name to malaria, calling it COVID-19, and allocating a unique budget to the treatment and prevention of COVID-19 instead of fumigating our environment to eradicate mosquitoes to avoid contracting it.

Participant 003, a male from FCT-Abuja, elucidated,

> What I know about it is that most of us around Nigeria believe it was invented in the lab, unlike malaria. Malaria is natural because when a mosquito bites you, you contract malaria, and real symptoms are reported. COVID-19, to me, does not have any distinct symptoms of its own, and they are the same symptoms of other diseases. So, the whole thing looks unreal to me. That is why I do not believe COVID-19 is confirmed in Nigeria. COVID never came to Nigeria because all the symptoms they give for it are symptoms we have been living with for centuries and already attributed to other diseases. It does not have any distinct symptoms of its own; as such, most Nigerians are suffering from ailments already in existence, such as malaria or cough.
>
> In continuance, with the interview, he stated, "I sincerely doubt the existence of COVID-19 and the mortality rate of COVID-19 disease. I doubt the existence of it, and even if it exists, the mortality rate in Nigeria is very, very, very, very, very minimal. That is why I feel that the vaccine hike in Nigeria's vaccine is fake.
>
> There was an ulterior motive by our corrupt leaders who only know how to enrich themselves because I have cases of some people who were being cajoled to admit that they are COVID-19 patients so that they will get some benefits. So, I

> sincerely doubt the existence of it, and even if it did exist, the mortality rate is minimal compared to other diseases that would be hyped about the vaccine in Nigeria, if not that some corrupt leaders stood to benefit from it.

Participant 005, a female from Enugu State, introduced multiple versions of information available to the public and her belief on COVID-19:

> Some people believe that it cannot be treated because COVID-19 is incurable. Others believe that at age 40 and above, you can survive it no matter what, even if you are infected. The good thing is that it kills older people more; people think it does not matter what you do; you can survive it if you are not up to 50 years old. Furthermore, people think it is the same disease as malaria. It is also a deadly disease, but people do not believe it; there is a consensus that all mosquitoes carry the malaria parasites when that is not the case, as only female mosquitoes carry them. Further, some people believe you cannot die from mosquito bites, so they stay in their homes instead of seeking medical care. Now you see someone feeling feverish but sees no need to go to the hospital because I have so many mosquitoes in my house so, I know it's malaria. I will be relieved with time. So, sometimes they allow this sickness, the malaria parasites to accumulate, and sometimes it kills them. So, malaria is also a deadly disease, but people do not tend to believe it.

Participant 002, a male from Taraba State, who considers himself an authority on the topic of COVID-19 posited,

> Do you know why? It is because Nigeria, located in sub-Saharan has abundant hot weather, which has been scientifically proven that COVID cannot survive under certain degrees of heat. In our country, where we have much sunshine, COVID-19 cannot survive, which is why I do not believe that the virus exists in the first instance. More so, COVID-19 cannot survive in our country because of the excessive heat. A disease is already in existence, and they are just giving it a new name.

From the data, I arrived at the understanding that multiple misconceptions about COVID-19 disease among the participants exist. These misconceptions include: (1) COVID-19 is not a real disease. (2) COVID-19 is a type of malaria. (3) COVID-19 is a disease of white people and cannot survive in hot climates. (4) COVID-19 is a tool of population control or a way for the government to make money. (5) COVID-19 vaccines are dangerous or ineffective. These misconceptions relate to the perceived susceptibility, perceived severity, perceived benefits, and perceived barriers domains of the HBM. Some participants may have lower perceived susceptibility to COVID-19, believing that they are not at risk of contracting the disease. This may be due to incorrect beliefs about the COVID-19 disease, such as the belief that it is a foreign disease or that the hot weather in Nigeria will kill it. Likewise, some participants may have a lower perceived severity of COVID-19, believing that it is not a serious disease. This may also be due to incorrect beliefs about the COVID-19 disease, such as the belief that it is similar to malaria. Also, some participants may have lower perceived benefits of the COVID-19 vaccine. This may be due to conspiracy theories about the vaccine or to distrust of the government or

the medical facilities. More so, some participants may have higher perceived barriers to vaccination. This may be due to a lack of access to vaccines or to concerns about the cost or side effects of the vaccine. The misconceptions about COVID-19 that I identified in the findings are likely to influence individuals' beliefs and attitudes about the disease, which can, in turn, impact their health-related behaviors. For example, individuals who believe that COVID-19 is not a real disease or that it is not a serious disease may be less likely to take preventive measures such as wearing a mask or getting vaccinated.

Overarching Theme 9: Sociocultural Factors Influencing Hesitancy to COVID-19 Vaccine Uptake

The four distinct sociocultural factors that affect individuals' decision to delay receiving the COVID-19 vaccine are culture, religion, self-determination, and family and friends. The participants' various perceptions or experiences related to these variables explained and justified their hesitance to get the COVID-19 vaccine, and these are concisely discussed below.

Emergent Theme 1: Culture

Findings revealed three distinct justifications, with some individuals taking the COVID-19 vaccine following cultural norms. A different group of people disagreed that getting vaccinations is culturally inappropriate. They think that since the symptoms are the same as or like those of other diseases that herbs have successfully treated for a long time with convincing evidence, the sickness may be treated with herbs. The latter group, however, said that neither the people nor the culture recognizes COVID-19 as a disease

that can be treated with vaccination or herbal remedies. These findings are related to the cue-to-action domain of the HBM.

Within this context, Participant 001, a male from Benue State, stated, "The culture is not in support; I do not think we as a people subscribe to that vaccine." Participant 005, a female from Enugu State, said, "They believe that the disease is deadly, and the vaccine is ineffective. It is not effective at all." Participant 015, a male from Plateau State, commented, "COVID-19 in Nigeria can be cured through traditional medicine because its symptoms are common ailments that have been combated with herbs for hundreds of years through local medication and therapy."

Participant 010, a female from Kaduna State denied cultural influence. She argued,

> Culture does not impact my decision because my decision is personal, but we also do not believe in the vaccine. The people are the ones providing all the herbs, and they believe it works." In another argument, Participant 017, a female from Cross River State, asserted that "my cultural inclinations are that the disease is for wealthy people.

Participant 002, a male from Taraba State, explained,

> It makes me laugh because when COVID came when we visited, those in villages often feared coming very close to us because they felt that we from the cities were coming home with a COVID disease. They look at it that we from the town or cities are the ones contracting it, just like we from the cities here assume that the disease is from abroad and it is coming from Europe. It does not affect us here in

> Africa, in particular Nigeria. So, those in the village assumed that we from the cities are the ones that can contract or bring what we call COVID-19 to them.

Participant 003, a male from FCT-Abuja, during the interview,

> As I earlier on told you earlier, we believe COVID-19 in Nigeria was a big man disease because it affected only the high-income class. So, the average person like me concluded that COVID-19 came to Nigeria to punish rich people. The vaccine is instead a tool for generic variation or something else. Moreover, that was the standpoint of my own culture.

Participant 004, a female from Benue State, adamant against vaccines posited,

> It does not exist; nobody takes the vaccine, and the culture never wants it. In this Kano environment, whatever happens, is destiny. Trying to run to get a jab (vaccine shot) for prevention, I think, is not common; it is not even 10% accepted.

In the last set of arguments that I collated, Participant 007, a male from Taraba State indicated his culture is not in the way, said to me, "My culture would allow the vaccine because they have been taking it ever since as children. So, I think the culture does not prohibit taking the vaccine." Participant 009, a female from Kogi State, consented "Yes, they don't, they participate in creating awareness for people going out for vaccinations, for the prevention of COVID-19 because they believe it exists."

Upon review of the findings from the data that I collected; I identified the crucial role that culture plays. To some participants, culture and traditional beliefs influence their decision to get vaccinated against COVID-19. The participants who believe that culture and traditional beliefs influence their decision to get vaccinated against COVID-19 are

likely to be influenced by social cues from their community members. For example, Participant 001 male from Benue State said "the culture is not in support" of vaccination, and Participant 005 Female from Enugu State said people in her community believe that the vaccine is ineffective. These participants are likely to be hesitant to get vaccinated if they are surrounded by people who do not support vaccination.

Emergent Theme 2: Family and Friends

Most of my study participants indicated that the decisions of family and friends affected the respondents' decision to receive the COVID-19 vaccine, influencing their hesitation to receive the vaccine. They believed the vaccine should be avoided out of caution since it either has negative or ineffective impacts on health. Other people's families were unconcerned about it since they thought COVID-19 was not for ordinary individuals, and others were urged to get the vaccine. These findings are related to the cue-to-action domain of the HBM.

To substantiate these findings, excerpts that I took from Participant 001, a male from Benue State, denies being impacted by family in decision making, "maybe 20%, not significant, I take my health very seriously." Participant 011, a male from FCT-Abuja, confirmed, "Most of them discouraged me from taking it." Participant 005, a female from Enugu State, stated, "None of my people, family, or friends impacted my decision. We also believe it is ineffective; even if it does not cost you harm now, it can cause you harm later." Participant 006, a female from Akwa-Ibom State, expressed, "Oh, for now, none of my family people have done the COVID thing. They believe that it is fake, that the thing is not real."

Participant 004, a female from Benue State, who claimed she knew better than to take the vaccine explained to me,

> Oh no, I have grown taller than that. I will, since it has not killed anybody, I know, but there was a place where I commented on the reference. This time, I went down to my maternal village, and my uncle and I were trying to discuss it. Moreover, my uncle vividly told me that his friend's father took the jab (vaccine shot), and his manhood refused to rise. His potency was okay before the jab (shot), but after the jab, his potency went off. So, I only asked if he had regained his potency once I left the village. That was two years ago, so I should leave that alone.

In a related finding that I obtained, Participant 016, a male from Taraba State, had asserted, "None of my friends, family, or colleagues have any impact on me not receiving the COVID-19 vaccine." Participant 018, a male from Delta State, noted, "I felt no impact from any of them; they have to respect my decision." Meanwhile, Participant 013, a female from FCT-Abuja, said, "They are rather indifferent" to receiving the COVID-19 vaccine." Participant 017, a female from Cross River State, added, "I was made to understand that the disease can only strive in cooler regions." Participant 003, a male from FCT-Abuja, claimed his family is indifferent towards the vaccine, he narrated to me:

> Oh, funny enough, my family members are indifferent; they are indifferent about it. They do not care because everybody becomes scared when they see something killing people. However, in Nigeria, COVID-19 was only a disease for the

> political class. I do not think it ever affected anyone on the street; it only affected those in Aso Rock (Presidential Villa), so my family members are thinking differently about it.

A reflection on the data that I collated revealed results that show social norms and social support play a role in COVID-19 vaccine hesitancy. Some participants reported that they were discouraged from taking the vaccine by their family and friends. Others reported that their family and friends were indifferent about the vaccine. The findings suggest that social norms and social support can act as cues to action or cues to inaction. For example, if participants' family and friends are supportive of getting the vaccine, they are more likely to get the vaccine. However, if participants' family and friends are hesitant about the vaccine, they are more likely to be hesitant about the vaccine as well.

Emergent Theme 3: Personal Decision

Results that I obtained over the participant's ability at self-determination appeared to be homogeneous: Some participants believe they should make decisions about their health without consulting their families. They also thought they were more intelligent than their relatives. More so, friends called convincing them to refuse the vaccine because they thought the condition was caused by malaria or another illness that could be treated locally. This is connected to the cues-to-action domain of the HBM. Within this context, Participant 013, a female from FCT-Abuja, disagreed saying, "Nobody impacts my decision; if I am asked to take the vaccine, it will be personal." Participant 010, a female from Kaduna State, stated, "Well, I am not telling them; I have not told anyone my decision. I just refuse to go there to take it, and nobody is aware that I have not taken

it." Participant 001, a male from Benue State, sure of his decision-making capabilities said to me,

> So, I am very conscious of my health and family, so decisions, especially about my health, are very personal. They could be more influenced. I may have like-minded people; you know that we can. Talk about it, but influence will not be the word.

Participant 003, a male from FCT-Abuja, who considered himself an influencer boasted of his impact on friends not to accept the vaccine:

> My colleagues so much believe in me. My decision not to be vaccinated is terrific and wise because, as I have said earlier, COVID-19 is more like malaria. It often happens to people in Nigeria because mosquito bites are considered normal in Africa, especially in Nigeria. Therefore, my friends look up to me and share my opinion of refusing to take any vaccine. I encouraged them not to do it because somebody decided to bring in a different name for malaria and said we should get back on taking the vaccine. I have heard that a vaccine can cause harm because it has a soul and many effects on us. So, we should not take it; my decision is still standing.

Findings from data that I collected revealed that Participants 013, 010, 001, and 003 all expressed a strong sense of personal autonomy in their decision-making about COVID-19 vaccination. They did not want to be influenced by others, and they believed that their decision was personal and should be respected. This is connected to the cues-to-action domain of the HBM. Cues to action are events, people, or things that trigger

people to change behavior. They can be internal (e.g., chest pains, wheezing, etc.) or external (e.g., advice from others, illness of a family member, newspaper article, etc.). The participants in these findings did not want to be influenced by external cues to action, such as advice from friends, family, or healthcare professionals. This suggests that they may be less likely to change their behavior based on cues from others.

Emergent Theme 4: Religion

From the demographics of the participants, I observed a homogeneous pattern as all the participants identified as Christians, and the majority claim their churches have encouraged or supported them in getting the COVID-19 vaccine. Information presented shows some churches encouraging their members by preaching about the vaccine, while others provide members with instructions and permit the government to give vaccines to worshippers in church settings. Breaking it down to the minority few, two of the participants' churches were neutral or unconcerned about the COVID-19 vaccine, and only one participant's church was vehemently opposed to receiving the vaccine. I connected this finding to the cue-to-action domain of the HBM.

Within this context, Participant 018, a male from Delta State, in response to his take on religion, answered, "My religion encouraged people to take the vaccine and also prayed seriously for the disappearance of the sickness." Participant 017, a female from Cross River State, aligned that "My religion encouraged members to partake in the vaccination against the disease. My religion, Christianity, completely believed in COVID-19 disease and COVID-19 vaccine." Participant 008, a female from Anambra State whose religion is pro-vaccine admitted,

> Yes, my religion does accept it. As for me, my religion does not have any conflict with whether you should take the vaccine, but my church believes the virus is real, and the virus exists, so there will be no objections if you choose to take the vaccine.

Participant 010, a female from Kaduna State, similarly explained,

> My religion does not affect my decision. I do not just want to take it. They are optimistic about this and encourage everyone to take the vaccine. They preach it even in church. If you have access to the vaccine, you should take it because it is helpful; we believe in the vaccine.

Participant 013, a female from FCT-Abuja, whose church is pro-vaccine commented,

> My church goes with the law by advocating for the COVID-19 vaccine, but as a place of worship, it does not enforce it. Christianity is a liberal religion; hence, my convictions of perceived manipulation and not my religious beliefs are crucial to my refusal of the COVID-19 vaccine.

Participant 001, a male from Benue State, commenting on disseminated information said,

> Yes, they recommended that everybody should take the COVID-19 vaccine. Not directly in the church, but they said people should come to the church for the vaccine. So yeah, I want to correct this impression because the church did not give any information, but instructions saying the government will give you a vaccine here on a specific date and the members should come for the vaccine.

Participant 016, a male from Taraba State, on the influence of his religion, shared,

> My religion advises us strongly to go for the vaccination. My religious beliefs and position on COVID-19 and the vaccine are first. It is the handwork of the devil trying to bring chaos to this world, so he rules over it; that is called divide and rule. Divide and rule is a situation whereby you create an issue to throw people off balance, and then you go ahead and do what you had planned to do in the first place. My religious beliefs are not against the COVID-19 vaccine at all.

Participant 003, a male from FCT-Abuja, on the influence of his church, explained:

> My church goes with the law; they advocated for people to take the vaccine at the place of worship, but they did not enforce it because, as a church, they are law-abiding. So, they did not stop anybody from taking the vaccine, nor did they enforce that people must take it before coming to church. They did not discourage anybody from taking it.

Meanwhile, two participants - Participant 015, a male from Plateau State commenting on indifference to COVID-19 vaccination, noted that in their church (he) was, "Indifferent and or neutral because there's bottled negativity that underlies not only my denomination's disposition to the COVID vaccine in Nigeria but in most religious bodies that include both Christianity and Islamic." Participant 007, a male from Taraba State addressed the muteness surrounding the vaccine:

> I am a Christian, and the church did not discuss anything concerning that. People are instead comparing it to the end times in the Bible. This trend has prompted discussions about the rise of unusual diseases, some requiring unique medical treatments, including COVID-19.

However, Participant 012, a male from Nasarawa State, who was worried commented,

> "Vaccines are harmful we should avoid it for now until proven otherwise. It is relative, some agree vaccines are necessary while others disagree, but I do not believe vaccines protect to a high degree from the virus."

Under this theme, I observed that the majority of participants (5 out of 9) had reported their religion encouraged them to take the COVID-19 vaccine. This suggests that religion can be a powerful cue to action for vaccination. Religion can also influence individuals' perceived benefits and perceived barriers to vaccination. For example, individuals who believe that their religion values public health and community well-being may be more likely to perceive the benefits of vaccination and less likely to perceive barriers to vaccination.

Overarching Theme 10: Attitudes Influencing Hesitancy to COVID-19 Vaccine

Attitudes appear to be a difficult variable as most of the participants remain hesitant to receive the COVID-19 vaccine. They are refusing to revise their stance on vaccination uptake since their pre-existing beliefs, ideas, observations, and experiences regarding COVID-19 or the vaccine predominate in their minds. Many of the center of the argument on the vaccine's ineffectiveness, the adverse experiences people have had with infertility, and others even claimed there was no need for the vaccine because they do not think COVID-19 exists. The findings align with the perceived susceptibility, perceived severity, perceived benefits, and perceived barriers domain of the HBM.

Within this context, Participant 011, a male from FCT-Abuja, said to me, "I do not believe in the vaccine. I strongly pledge my belief in the conspiracy against the

vaccine. Hence, I cannot take it or recommend it to anybody. COVID-19 victims should treat themselves with home or herbal medications." Participant 013, a female from FCT-Abuja, shared, "I know of people who received it, but I do not see any significant positive difference between them and myself, so I still feel it was just unnecessary."

Participant 001, a male from Benue State, who was still adamant not to take the vaccine said, “Not much has changed; my convictions are still there, as the information I have would not allow me to take that vaccine. Being aware of a condition like that, I will be more preventive than the vaccine.” Participant 012, a male from Nasarawa State, who did not sound optimistic explained,

> Some individuals who were vaccinated still died of the disease, and the number of jabs (shots) required for protection is uncertain; I believe the vaccine does not elicit the required protection against COVID-19. I am unsure how to react to the vaccine since some folks have reported adverse vaccine reactions.

Participant 014, a male from Rivers State, who wanted to be law-abiding noted:

> It is a matter of following the bandwagon so others will not see me as a lawbreaker. For me, taking it was never necessary; it is unnecessary since taking the vaccine is not a care solution because one can still suffer from the virus even while walking around with a face mask. I will not take it at all. If God cannot heal me, then no vaccine can. I will treat malaria.

Participant 018, a male from Delta State, who was anti-vaccine and adamant answered,

> There is no discussion with anyone on it that will change my mind because since I was little, I have not taken vaccines or injections. I have a good blood group

> immune system that fights any disease. I hardly took drugs/vaccines right when I was little.

Participant 002, a male from Taraba State had serious questions about the relevance of vaccines:

> Well, the question I always ask is: for those vaccinated, is there any way they can avoid contracting the virus anymore? The answer I usually receive is no, as people tell me it is not up to the person who has not been vaccinated to say. So, is the virus curable? Is it avoidable? I ask these questions because they said the vaccine does not stop someone from contracting it again but instead reduces the high associated rate of pain. I therefore see no need to take the vaccine.

Participant 004, a female from Benue State, who did not believe in this vaccine said:

> I do not think I will; for me, no. I do not believe in it, so I would not want to recommend it as a cure to treat another person. What I do not believe in, I do not think I believe it for someone else, as I said initially, that I will be sick. If you are convinced, you can take the jab (shot) for me. I do not advise it.

Participant 005, a female from Enugu State, anti-vaccine affirmed,

> I do not believe in the vaccine, so I do not believe that the vaccine is made up of something to improve the immune system. I do not believe in it, even if it is made up or provided for us here. I do not believe in the vaccine myself. I will not even take it because I do not believe in it.

Participant 006, a female from Akwa-Ibom State, pro-vaccine but against untimely vaccination expressed,

> My decision remains the same: I do not want this vaccination now. To me, I do not. Apart from my thoughts, what am I using the vaccine for? If something is not wrong with me, why should I start taking that vaccine for no good reason? So, there is no need to take it. When it is needed, I can rush and do it. So, I do not see any point in doing it, even though I have read scary stories about how it can affect people, their respiratory system, the coughing, and everything. For me, I still say no. So far, this has never happened to any of my family, and I am not sure that will happen again.

The only favorable probability to accept the COVID-19 vaccine was indicated by Participant 008, a female from Anambra State. Participant 008 expressed this view over what her co-participants said,

> I do not see why we should run away from taking the vaccine or not want to, but I have not. As I said earlier, I have not had the time to go for it, but I will do it. For now, that is just how it is.

I realized that the majority of the participants in the findings do not believe in the COVID-19 vaccine and are hesitant to take it. The participants may have lower perceived susceptibility and perceived severity of COVID-19. They may also have lower perceived benefits of vaccines and higher perceived barriers to vaccination. For example, Participant 001 said that they are "more preventive than the vaccine" and Participant 014 said that they "will treat malaria" instead of taking the vaccine. This suggests that these participants have lower perceived susceptibility and perceived severity of COVID-19. Participant 012 said that they are "unsure how to react to the vaccine since some folks

have reported adverse vaccine reactions" and Participant 018 said that they "see no need to take the vaccine" because they have a "good blood group immune system." This suggests that these participants have lower perceived benefits of vaccines and higher perceived barriers to vaccination.

Overarching Theme 11: Other Factors Influencing Hesitancy to COVID-19 Vaccine Uptake

Besides the Overarching themes that I mentioned previously, findings show other factors that influence participants' hesitancy to receive the COVID-19 vaccine. They are: Conspiracy theory, death, health concerns, infertility, media, attitudes of healthcare professionals, the ineffectiveness of the vaccine, vaccine production time, selling of the rights to produce the vaccine, lack of availability and Inaccessibility of the vaccine, and long wait times involved in receiving the vaccine are some of the things found to be mitigating against vaccine uptake.

Emergent Theme 5: Chips to Control Humans

The findings revealed to me the participants' hesitation to receive vaccination was based on their perception that it was a chip to control people or a chip for the third world war that would give the West simple access to world dominance. Thus, the findings have suggested a perceived barrier to COVID-19 vaccination, which is linked to the HBM. I noticed a consensus among some of the study participants; Participant 012, a male from Nasarawa State, claimed "The inability to trust the West or manufacturers of the vaccines is a barrier." Participant 014, a male from Rivers State spoke without fear saying “The

vaccine is a manufactured virus for the Cold War." Participant 015, a Plateau State male, added, "It is the mark of the antichrist or mark of the beast."

Participant 004, a female from Benue State also in favor of the conspiracy theory but in fear of being reprimanded by the authorities further explained,

> The way they operate, I still believe that the jab (the vaccine shot) is more of a chip. It is a chip to centralize the activities or checkmate the activities of humanities. I do not know what the foreigners think about it, but I believe it and am convinced that the jab is a chip. If not, why is there a struggle between the giant pharmaceuticals? Where is Wuhan that this thing came from located? I heard activities were shut down partially in Wuhan; I have much to discuss. I cannot say it is more than me, but I cannot say what I want to say sometimes because of security.

The majority of the participants I interviewed expressed distrust of the COVID-19 vaccine and its manufacturers. They believed that the vaccine may be harmful or that it was part of a conspiracy. The HBM includes a construct called perceived barriers, which refers to the individual's belief that there are obstacles to taking preventive action. Distrust of the COVID-19 vaccine and its manufacturers is a significant perceived barrier to vaccination.

Emergent Theme 6: Conspiracy Theory

The participants in my study expressed concerns about being assaulted via the vaccination, believing that it does not affect black people, and blamed the COVID-19 infection that caused the vaccine to be given to black people. They consequently felt

extremely uneasy or hesitant to receive the vaccine. The findings are aligned with the perceived barriers, cues to actions, and self-efficacy domains of the HBM. According to the interviewees - Participant 012, a male from Nasarawa State, shared information circulating in the country saying "People confirmed that the vaccines used in Africa were labeled with the title, should not be used in Europe or America, thus suspicions developed." Participant 005, a female from Enugu State, stated, “The "vaccine has been provided, but so many people have refused to partake in the vaccination because they think it will cause them harm." Participant 016, a male from Taraba State, added, "First, it is the handwork of the devil trying to bring chaos to this world, so he rules over it; that is called divide and rule."

Participant 004, a female from Benue State, referencing past experiences stated,

> Now, we say it is not our friend; there was also a theory, which is that it does not kill blacks. However, what is responsible for damaging the lives of black people in the United States has been brought to us.

I identified the major point as a lack of trust in COVID-19 vaccines among the participants. The lack of trust in COVID-19 vaccines among some people can be explained by the perceived barriers, cues to actions, and self-efficacy domains of the HBM constructs. Accordingly, some participants believe that there are obstacles to getting vaccinated, such as a lack of access to vaccines, the cost of vaccines, or the inconvenience of getting vaccinated. Some participants did not receive clear and concise information about the benefits of vaccines and the risks of not getting vaccinated. Some

participants did not have confidence that they could get vaccinated safely or that the vaccines would be effective.

Emergent Theme 7: Death

I identified fear as a mitigating issue because six of the participants claimed feeling they might die if they received the COVID-19 vaccination, indicating there was never a good reason for them to take it. Some people thought the vaccine was a killer, and cautioned that the vaccine's impacts might extend beyond death or COVID-19 disease. This finding is related to the perceived benefits, perceived barriers, and self-efficacy domain of the HBM. To substantiate this, Participant 017, a female from Cross River State, stated, "Death is never a reason for me to take the vaccine since death is inevitable." Participant 015, a male from Plateau State, said that "some believe they'll die if they take it." Participant 010, a female from Kaduna State, said, "No, not enough reason for me to take the vaccine. I do not know whether the vaccine in my area can even cost me much more of these things faster than COVID-19 itself."

Participant 012, a male from Nasarawa State, who had doubts over the efficacy of the vaccine added, "Some who were vaccinated still died of the disease, and the number of jabs (vaccine shots) required for protection is uncertain; my personal belief is that the vaccine does not elicit the required protection against the COVID-19 Virus." Participant 014, a male from Rivers State, adds "Death was never sufficient reason to take the vaccine. You can fact-check me; all the projections about Africa died on arrival." Participant 015, a male from Plateau State, noted, "For the old, the chance of survival is 50/50, but for me, I'm not scared of dying by COVID-19 because I'm young and my

immune system is strong." Participant 007, a male from Taraba State, who was aggrieved and doubtful laments:

> Yes, I have a colleague who took the vaccination, and we don't know whether it was a vaccine; if yes, which of the vaccines did he take? – Modena, Pfizer, or Johnson and Johnson? I do not know which one he took, but he died shortly after taking the vaccine. The guy was hypertensive before taking the vaccine. Some of my people say it was the vaccine; you will die when you take it after some time. You know, it was mainly produced to reduce a specific population from a particular color of people.

Participant 011, a male from FCT-Abuja, talked about not feeling intimidated by death:

> A significant consequence is death. Death is not a reason for me to take the vaccine. PEOPLE MUST DIE with COVID-19 or no COVID-19, so if I apply home or herbal medication and die, then it means that it is the right time for me to die.

Participant 003, a male from FCT-Abuja, also commented death was not a deterrent:

> Talking about death, I know so many diseases that are very deadly in Nigeria; malaria is number one, HIV is another, and hepatitis is there. So, I see them as more deadly diseases than COVID-19. I have not seen the deadly nature of COVID-19 in Nigeria, which is why I am not bothered about this – no death.

In this finding, I noticed the issue at stake was safety. Some participants expressed concerns about the safety and effectiveness of the COVID-19 vaccine. They cited concerns about the potential for death after vaccination, the uncertain number of

jabs required for protection, and the possibility that the vaccine may not be effective in people with certain health conditions. The participants who expressed concerns about the safety and effectiveness of the COVID-19 vaccine may have lower perceived benefits of vaccines and higher perceived barriers to vaccination, such as the fear of death. They may also have lower self-efficacy for vaccination if they believe that they are not at risk of contracting COVID-19 or if they believe that the vaccine is not effective.

Emergent Theme 8: Health Concerns or Diseases

The results that I obtained show that participants were worried that receiving vaccines would affect their health negatively. Their knowledge of individuals who had passed away or experienced severe health problems attributed to the vaccine made them wary of getting it, contributing to some of their hesitancy. This finding aligns with the perceived benefits, perceived barriers, perceived susceptibility, and perceived severity domains of the HBM. According to the participants: Participant 001, a male from Benue State, believed the vaccine is toxic blurted out to me.

> I am scared, the challenges I have are derived from the experiences of people who have taken the vaccines. That is, the way they reacted which adds to my insecurity because I do not know if my health can take it well.

Participant 002, a male from Taraba State, who indicated vaccine can make people sick maintained, "Yes, there is a belief that the COVID-19 vaccine can make you sick. It will open your body system to other viruses you ordinarily would not have contracted." Participant 014, a male from Rivers State, stated, "It puts one in an uncomfortable state, the belief that it is just a malaria attack makes the fear of death less considered."

Participant 016, a male from Taraba State, who believed vaccines are toxic shared that "Vaccines contain toxic ingredients that can harm you." Participant 017, a female from Cross River State, pointed out her issue with the vaccine, "What deters me from taking the COVID-19 vaccine is the side effect suffered by those that took the vaccine." Participant 004, a female from Benue State, who indicated her health is in an optimum state explained,

> Nothing really, but I think I believe my health status is okay; I do not want any foreign body to contaminate the one I am managing here. I know some people that would not take drugs. They would not take drugs, and they would still be all right, and they are still 70-something and above. So, I believe that you will be strong again when you sleep well and wake up. Let us not go that far.

Participant 008, a female from Anambra State, concerned over complications of illness after vaccine administration expressed,

> I do not have any reason besides the changes one's body is said to experience after taking the vaccine, which makes others scared of going for the vaccine. The changes I mentioned earlier, such as allergic reactions, fever, cough, nausea, and dizziness, influence people to believe it has negative impacts. They are resistant to taking the vaccine. The vaccine harms health, so I do not want to take the vaccine.

Under the health concern's theme, the findings show the participants had multiple concerns about the COVID-19 vaccine, including (a) fear of side effects, (b) belief that the vaccine can make you sick, (c) belief that the vaccine is unnecessary because they are healthy, and (d) belief that the vaccine contains toxic ingredients. These concerns suggest

that they have lower perceived benefits of the COVID-19 vaccine and higher perceived barriers to vaccination. They may also have lower perceived susceptibility and perceived severity of COVID-19.

Emergent Theme 9: Infertility

The myth that vaccines are here to cause fertility to reduce population was highly pronounced. Five participants clarified that their hesitancy was based on the vaccine's intended purpose: to lessen the African population. They supported their claim that the vaccine decreased a recipient's masculinity potency with their own experience. This finding aligns with the perceived benefits, perceived barriers, cues to action, and self-efficacy domains of the HBM.

Within this context, Participant 014, a male from Rivers State, cautioned “Never accept the vaccine, mainly if it targets fertility. My uncle in the village told me that his friend's father had taken the vaccine, and his male organ stopped working. It is a mere orchestration to reduce population.” Participant 12 answered, "There are negative impacts, some believe it's an agenda to microchip all Africans for population reduction." Participant 015, a male from Plateau State, added "Others’ say it is the Whiteman's medium of reducing the African population." Participant 004, a female from Benue State, explained,

> However, to be candid, in this area, there are lots of conspiracy, but it is a way of reducing fertility. Furthermore, this is not something to joke about in this place because I'm not from this area. You are supposed to have a large family, and if anything is coming to reduce your fertility, such is totally against you. So, there is

> a need to resist it. I can beat my chest; I have never had contact with any group of persons trying to introduce the need for the vaccine to any group right now.

In this finding, some participants believed that the COVID-19 vaccine is a plot to reduce the African population. They may have heard this conspiracy theory from friends, family, or social media. The participants who believed that the COVID-19 vaccine is a plot to reduce the African population may have lower perceived benefits of vaccines and higher perceived barriers to vaccination. They may also have lower cues to action and lower self-efficacy for vaccination.

Emergent Theme 10: Attitude of Healthcare Workers

A finding that I observed disturbing to many participants was the lack of professionalism and expertise among healthcare workers. The participants expressed disapproval of the way medical personnel administered the vaccine. Some people were reluctant to receive the vaccine due to disorderliness, poor orientation, and unclean handling of tools and environment because they feared they could be injected accidentally with an outdated vaccine that could harm their health or contract an infection in the designated health centers. These findings are related to the perceived barriers, a construct of the HBM. Participant 010, a female from Kaduna State, who lacks interest explained,

> Okay, what will make me not receive it? I do not have any interest. I am not interested in receiving it because the health workers are not careful enough to give me the vaccine. They are too careless. In Nigeria, the government does not want to spend much money on health, so they do not even get qualified nurses or

> medical personnel to care for all these things. They get the ones they can pay for, that is, the cheap ones.

Participant 015, a male from Plateau State, who had felt deterred by the health workers' lack of professionalism over the vaccine exercise reported,

> No, instead, health workers were saddled with the responsibility of creating awareness and encouraging citizens to take the COVID-19 vaccine, discouraged and denied me the privilege of getting the vaccine. They gave preferential treatment, hoarded the vaccine, and made it look like it was their father's property and as though they were doing us a big favor by attending to us.

Participant 014, a male from Rivers State, admitted events made him develop a misconception about the vaccine:

> It came to a point that even in Nigeria, some doctors were like if you can take care of yourself and take malaria drugs, you will get healed of it. That is where my misconception about it began. It pushed many people away from accepting anything related to COVID-19 vaccines. However, I remember when one of the nurses who worked with me was vaccinating people. Will it be like jab 1, jab 2, or jab 3? That was when I lost my interest in it. In total, one jab was not enough for people to receive. Also, the medical centers are unsafe, litter is everywhere, and the orientation is inferior.

The main findings that I isolated were patient safety and the competence of healthcare workers (HCW). Here, some of my study participants expressed concerns about the quality and safety of COVID-19 vaccines and the competence of HCW. These

concerns are related to the perceived barriers construct of the HBM. Participant 010 expressed concerns about the carelessness of healthcare workers and the lack of qualified medical personnel. Participant 015 expressed concerns about preferential treatment and the hoarding of vaccines. Participant 014 expressed concerns about the misconception that COVID-19 can be cured with malaria drugs, the repetitive nature of the vaccine, and the unsanitary conditions of medical centers.

Emergent Theme 11: Ineffectiveness of the Vaccine

The myths, and other supporting events (for example fear, vaccine production time, fraud, social media) findings that I isolated under this theme cast doubts against the efficacy of the vaccine. Participants complained about the COVID-19 vaccine's ineffectiveness, which meant it failed to achieve its intended preventive goal of being produced or delivered to the public. As a result, they did not think it was worth receiving if it could not prevent them from becoming infected with the disease. This finding speaks to the perceived benefits domain of the HBM.

Thus, according to the participants that I sampled, Participant 010, a female from Kaduna State, shared the experience of others "People say, it is not effective, and some people say it causes more harm than good." I have not taken it, but it also causes more harm than good. Participant 012, a male from Nasarawa State, commented, "My personal belief is that the vaccine does not elicit the required protection against the COVID-19 virus. The vaccine does not protect 100 % as such I do not trust the efficacy of the vaccines." Participant 016, a male from Taraba State, added, "Me, I am against it because I don't think it's effective, not with what I have seen from afar." Participant 017, a female from

Cross River State, answered, "What deter me from taking the COVID-19 vaccine is the side effects suffered by those that took the vaccine." Participant 005, a female from Enugu State, argued,

> I believe that the vaccine is not effective as they claim, and it can cause more harm than good." Participant 003, a male from FCT-Abuja, answered, "I believe that the COVID-19 vaccine is not effective because I heard of people, though I did not see, I heard of people who took the vaccine and still contracted the COVID-19 disease. So, I feel it is not effective.

Participant 004, a female from Benue State, explained,

> When you complete the three jabs (shots), you are still not free from contracting COVID-19. So, I asked myself, why the jab? When I tried to ask to know more, they said it was to prevent myself from contracting and helping others from contracting it. You can contract it, but it will not kill you.

Participant 007, a male from Taraba State, responded,

> There are no barriers. The only thing is my emotions concerning the efficacy of the vaccine. And that is what I put into question. What is the essence of taking the vaccine if it is not preventive? If you take it and you still contract COVID-19 disease, what is the use of producing a vaccine that is not preventive? You know, that is my take on that.

In these findings, some participants expressed concerns to me about the efficacy of the COVID-19 vaccine. They shared their own experiences or the experiences of others who had taken the vaccine and still contracted COVID-19. They also questioned

the purpose of taking the vaccine if it does not prevent COVID-19 infection. The HBM includes a construct called perceived benefits. Perceived benefits are the individual's belief that taking a preventive action will benefit them. The participants who expressed concerns about the efficacy of the COVID-19 vaccine have lower perceived benefits of the vaccine. They believe that the vaccine is not effective in preventing COVID-19 infection, or that it is not worth taking the vaccine because it does not fully prevent COVID-19 infection.

Emergent Theme 12: The Vaccine Production Time

Three of my study participants explained in detail their concerns regarding the rapid pace of the manufacture of the COVID-19 disease vaccine. Since their understanding of vaccine production typically requires more time than manufacturing the COVID-19 vaccine, they objected to its rapid production. This finding relates to the perceived benefit domain of the HBM. According to the participants, Participant 016, a male from Taraba State, said, "Vaccine was developed too quickly without proper research, and it is not safe." Participant 001, a male from Benue State, concerned over the rapid production of vaccines answered,

> That is the most controversial topic about COVID-19. We heard, you know, we heard the WHO declared COVID-19 as a global epidemic, and then there was a vaccine within a year. I am bold enough to say that vaccine takes years, not within a year, you know they started giving. It did not feel right that the vaccine was developed quickly within a year, and they started giving it to people. Yes, we are talking about the vaccine now. The vaccine, for starters, was hurriedly made in

> too much hurry. Vaccines are a very, very slow process to make. It is a slow research and testing process; a year was just a red flag for me. Hurriedly producing the vaccine within a year was a red flag for me. Very, very, very big red flag and the information was not in unison as in the case of other vaccines.

The information shared shows participants thinking outside the box over the vaccine's rapid production time. Participant 007, a male from Taraba State, explained,

> You know my wife is a biologist, and because of the short span in which the vaccine was manufactured, we felt it was not too good because there are other diseases and other challenges that come along over time that no vaccine was developed concerning COVID-19. The time frame for developing a vaccine was too short, and it was not proper. Using layman's knowledge, we thought a vaccine of that nature would have been up to more than the time it took to develop it. So, we doubted the efficacy of that vaccine, which is why we did not take it. I am not a scientist, but my strong personal belief is that the vaccine was not tested through clinical trials, maybe not enough. The time frame in which the vaccine was produced is of great concern to me, which is why I still have questions. Because other diseases have existed for a long way, you know, the vaccine has not been developed for them. Then you developed the COVID-19 vaccine, which is just a recent something you know, so that is just my inhibition.

In this finding, rapid time of production appeared to increase mistrust over the vaccine. Participants 016, 001, and 007 all expressed concerns about the speed with which the COVID-19 vaccine was developed. They believe that the vaccine may not be

safe or effective because it was not tested thoroughly enough. This aligns with perceived benefit domain of the HBM. Participants who are concerned about the safety and efficacy of the COVID-19 vaccine may have lower perceived benefits of vaccination.

Emergent Theme 13: Fraudulent or Corrupt Practices

Corruption was an issue that was touched upon by some of the participants during our interviews. Participants believed the government had engaged in corrupt practices by proclaiming COVID-19 sickness in Nigeria and procuring the vaccine to make or siphon off money. They disputed over whether Nigerian states should take the COVID-19 vaccination or the disease. However, those states that disagreed or refused to receive the vaccine did not get the sickness, leading them to assume that another government might have other ulterior motives. The finding relates to the perceived susceptibility, perceived severity, and perceived barriers of the HBM.

Within this context, Participant 014, a male from Rivers State, who believed COVID-19 is a scam commented "The government makes money from sales of the vaccine." Participant 015, a male from Plateau State, stated "In Western and other countries, it might be a pandemic, but in Nigeria, it is a scam; there is nothing like COVID-19 in Nigeria. COVID-19 cannot thrive in the Nigerian weather; as such, so-called victims were malaria or TB patients." Participant 002, a male from Taraba State, who also shared the scam opinion explained,

> We saw COVID-19 in Nigeria as a scam because fake figures are given to earn money from the federal government by individuals who are rich and willing to sponsor such lies. So, we refuse to admit that it is an actual disease. For instance,

> in the first instance, Kogi State refused to accept COVID-19 as a disease. There was no record of COVID-19 disease, and people are still in the state and others transiting on their way to Lagos. Why are people still doing everyday things, and you said it is an airborne disease? Why is it that people from Kogi State were not contracting it?

Further,

> In Benue State and Taraba State, where I come from, there was nothing like COVID-19 until many persons said to have contracted it appeared. The state governors started giving figures to earn money from the federal government. The government started pumping money to curb the spread of COVID-19 disease; that is my check. Abroad is a different thing, but let me talk of Nigeria, my country of birth. There is nothing like effective control of COVID-19; the people at the helm of the affairs have their way, as usual. It serves as a means of getting money, just like I have mentioned, from the federal government, from individuals who are well-to-do and are willing to support.

Participant 003, a male from FCT-Abuja, supported this opinion:

> The COVID-19 vaccine was politicized in Nigeria, which is common among Nigerian people, especially our politicians. It was politicized and used to enrich specific individuals. Most people had to be coerced or sanctioned before accepting the vaccine because they never saw COVID-19 as deadly. I heard some people were sacked from their workplaces because they refused to take the vaccine. So, it was politicized, and people used the opportunity to make money

> and all of that. The only ruling political ideology in Nigeria is corruption, so they create opportunities for their monetary benefits when they politicize it. They forced people to make it look real; still, people were unwilling to come out for vaccination.

In this finding, some of the participants believe that COVID-19 is a scam that was orchestrated by the government to make money. They pointed to the fact that there are no COVID-19 cases in some states and that the vaccine was politicized as evidence of this. In connecting the findings with the HBM, the participants who believe that COVID-19 is a scam may have low perceived susceptibility and perceived severity of COVID-19. They may also have high perceived barriers to vaccination, such as mistrust of the government and concerns about the safety of the vaccine.

Emergent Theme 14: Unavailability and Inaccessibility to the Vaccine

A finding crucial to the success of any vaccination program is the availability and access to designated sites. The citizens of Nigeria accused the government of providing an insufficient amount of the vaccine at the collection sites. Even though it was reported to be available, it was not accessible because of the long line of individuals waiting to receive the vaccine. These allegations raised questions about the vaccine's availability and accessibility. Prominent people had previously hijacked the vaccines. This finding relates to the perceived barriers of the HBM.

According to the participants, Participant 014, a male from Rivers State, argued, "Not really, except that one has to be transported to the hospital for the vaccine." Participant 005, a female from Enugu State, said,

> Yes, I thought for me, not believing in the vaccine, and not wanting to take it, if by any chance, I want to take it today, it is not easily accessible in my location. Also, if I were to take the vaccines today, I would not find them.

Participant 007, a male from Taraba State, who had no problem accessing the vaccine answered, "I have access to it; the collection point is close to my house. Well, in the villages, some people may have challenges to accessibility." Participant 010, a female from Kaduna State talked about vaccine unavailability and explained,

> The vaccine has been provided, but it is not in every area and even where it was made. It may be available, but people cannot take it for various reasons. If I decide today that okay, I want to take this vaccine; there is no vaccine in my area. Furthermore, it is not easily accessible. If I want to take it now, I must travel because it is unavailable in my location.

Participant 004, a female from Benue State, explained that

> When the vaccine came out, I was following it, yes. The first batch delivered was between 2 million and 4 million, which is not up to one percent of the Nigerian population through the arrangement. It targeted the vulnerable, the youth, and the older adults. That was what the NCDC told us they were going to do. Along the line, the bigwigs, the politicians, the rich, and the men of influence hijacked it. So, it took a long time before it came to the hinterlands, the lower places. Since they are not accessible and there is a delay in getting it, the routine of 1 to 3 shots on the same day instead of at different times based on the start date.

In this finding, some of the participants reported to me having difficulty accessing the COVID-19 vaccine in their location. This suggests that accessibility is a barrier to vaccination for some people in Nigeria. The participants who reported having difficulty accessing the COVID-19 vaccine may have higher perceived barriers to vaccination. This is because they believe that there is an obstacle to them getting vaccinated (i.e., the vaccine is not easily accessible in their location).

Discrepant Cases or Nonconforming Data

This study's targeted population was the unvaccinated population for COVID-19 disease of ages 18–60 in Nigeria. The study was designed to collect data from a representative sample of the Nigerian population. However, an unusual trend was observed in the data collection. Only Christians indicated interest in participating in the study. Muslim populations did not respond to the study. This means that the data collected is not representative of the Nigerian population. There are a few possible explanations for this discrepant case. A possibility is that Muslim Nigerians may be hesitant to participate in the study for religious and/or cultural reasons. It is also possible that the study design itself was biased in some way, making it less likely that Muslim Nigerians would participate. It is important to note that this discrepant case does not mean that the study is worthless. The study or data collected are valuable for understanding the perceptions of Christian Nigerians.

Summary

In answering RQ1, I developed four overarching themes from the transcripts. These include perceptions on COVID-19 disease, symptoms of COVID-19 disease, personal experience with COVID-19 disease, and others' experience of COVID-19 disease. The participants' perceptions on COVID-19 disease succinctly answered the perceived susceptibility and perceived severity domains of the HBM. Perceived susceptibility argues that if a person has personal experience with COVID-19 or knows someone who has had the disease, they are more likely to believe that they are at risk of developing the disease. The participants' awareness of the symptoms of COVID-19 disease can influence their perceived severity of the disease. Participants who had personal experience with COVID-19 are likely to have a high perceived susceptibility to the disease. Several participants mentioned that they had not personally met anyone who had COVID-19, or that they knew people who had COVID-19 but who only had mild symptoms. This suggests that these participants may have a lower perceived severity of COVID-19 than people who have had personal experience with the disease or who know people who have had serious cases of COVID-19, The findings also suggest that participants' perceptions of COVID-19 severity were influenced by the misinformation that they had encountered.

In answering RQ2, I developed three overarching themes by analyzing the transcripts using the HBM and IPA. The overarching themes include perceptions on the effectiveness of the COVID-19 vaccine, herbal medicine for treating COVID-19 disease, and individual preference for treating COVID-19 disease. These themes relate to the

perceived severity, perceived barriers, and perceived benefits domain of the HBM. Participants had concerns about the safety and effectiveness of the COVID-19 vaccine. These concerns are relevant to the perceived severity, perceived barriers, and perceived benefits domains of the HBM. The majority of the participants were aware of the potential use of herbal therapy to treat COVID-19 patients. They based their belief in the potency of herbs on personal experiences, traditional knowledge, and the perceived similarity between COVID-19 and malaria. The participants who favored the use of herbs and traditional remedies may have lower perceived susceptibility and perceived severity of COVID-19. They may also have lower perceived benefits of vaccines and higher perceived barriers to vaccination. The participants who believe that vaccines are the best way to prevent and treat COVID-19 may have higher perceived susceptibility and perceived severity of COVID-19. They may also have higher perceived benefits of vaccines and lower perceived barriers to vaccination.

In answering RQ3, I developed four overarching themes from the thematic and IPA of the data collected. These include knowledge influencing hesitancy to COVID-19 vaccine uptake, sociocultural factors influencing hesitancy to COVID-19 vaccine uptake, attitude influencing hesitancy to COVID-19 vaccine uptake, and other factors influencing hesitancy to COVID-19 vaccine uptake. The findings connect with the perceived barriers, self-efficacy, and perceived severity domains of the HBM. There are several misconceptions about COVID-19 disease among the participants. These misconceptions relate to the perceived susceptibility, perceived severity, perceived benefits, and perceived barriers domains of the HBM. Some participants have lower perceived

susceptibility to COVID-19, believing that they are not at risk of contracting the disease. Some participants have a lower perceived severity of COVID-19, believing that it is not a serious disease. Some participants believe that culture and traditional beliefs influence their decision to get vaccinated against COVID-19 and are likely to be influenced by social cues from their community members. Findings revealed that Participants 013, 010, 001, and 003 all expressed a strong sense of personal autonomy in their decision-making. The majority of participants reported that their religion encouraged them to take the COVID-19 vaccine. This suggests that religion can be a powerful cue to action for vaccination. Religion can also influence individuals' perceived benefits and perceived barriers to vaccination.

Other factors influencing hesitancy include conspiracy theories, death, health concerns, infertility, media, attitudes of healthcare professionals, the ineffectiveness of the vaccine, vaccine production time, etc. The lack of trust in COVID-19 vaccines among some people can be explained by the perceived barriers, cues to actions, and self-efficacy domains of the HBM constructs. The participants who expressed concerns about the safety and effectiveness of the COVID-19 vaccine have lower perceived benefits of vaccines and higher perceived barriers to vaccination, such as the fear of death. In Chapter 5, I have discussed the interpretation of the results, the study's limits, the recommendations, the implications for a constructive social transformation, and the conclusion.

Chapter 5: Discussions, Conclusions, and Recommendations

Introduction

In this study, I explored the knowledge, attitudes, and hesitancy toward COVID-19 vaccination uptake in Nigeria. Vaccine hesitance inhibits COVID-19 vaccination uptake among countries, including Nigeria, posing a severe challenge to governments and public health specialists in combating the pandemic (Okoli et al., 2019; Quinn et al., 2019). Sato and Fintan (2020) stated that vaccine hesitancy is common in underdeveloped nations like Nigeria. For instance, Islamic clerics in Nigeria reportedly abstained from the 2003 polio vaccination campaign because they lacked confidence in its effectiveness (Jegede, 2007).

According to Josiah and Kantaris (2021), Nigeria is experiencing a decline in COVID-19 vaccination uptake. According to research, high vaccination rates in Nigeria depend on the population's demand for and willingness to take the vaccine, vaccine availability, and the supply of the COVID-19 vaccine (Nigeria Health Watch, 2021). For vaccination interventions to be successfully implemented in Nigeria and to protect the general population, there must be universal vaccine acceptance (Nigeria Health Watch, 2021). Although literature exists on COVID-19 vaccine acceptability in Nigeria (Adetayo et al., 2021; Iliyasu et al., 2021; Tobin et al., 2021), media exposure, and COVID-19 vaccine (Anorue et al., 2021), no research has explored the reasons why the unvaccinated Nigerian population remained unvaccinated or hesitant to COVID-19 vaccination.

In this study, I examined the phenomenon of vaccine hesitancy through the HBM lens to further describe COVID-19 vaccine hesitancy among unvaccinated adults between

the ages of 18 to 60 years in Nigeria. I aimed to gain knowledge on the research phenomenon, contribute to the body of knowledge, bridge the gap in public health, and generate findings that may promote positive social change.

This study's IPA research tradition addressed the three central RQs. The rationale for choosing the research design was that IPA searches out study participants' opinions and interprets their interpretations of life events and experiences (Tanwir et al., 2021). According to Teherani et al. (2015), phenomenology is a type of inquiry that aims to describe the essence of a thing by looking at it through the viewpoint of individuals who have witnessed it. The goal of phenomenology is to explain the significance of the experience in terms of what happened and how it happened. IPA attempts to explain the participants' experience of the study phenomenon, using the interpretative approach to explain the concept, what happened, how it happened, where it happened, and when it happened (Neubauer et al., 2019).

The suggested number of participants to be interviewed was 10 to 16. I used purposive and snowballing selection sampling techniques to interview consenting participants via Zoom and WhatsApp internet phone conversations. After conducting 14 interviews, I determined saturation was reached when the data collected generated no new themes (Jackson et al., 2015; Middlemiss et al., 2015). At this point, I felt I had gained an understanding of the participants' perspectives as related to IPA (Tanwir et al., 2021). To ensure saturation, I conducted four additional interviews bringing the total to 18 but no new emergent themes were observed, so I stopped data collection (Saunders et

al. 2018). For instance, I heard the same comments over and over on the nature and origin of COVID-19, and about conspiracy theories shared on social media forums.

After transcribing the audio of the interviews, I cleaned the data by carefully reading the transcript while listening to the audio. I corrected any misspelled or omitted words likely caused by the study participants' dictation and pitching. I correctly labeled the participants from 001 to 018 using identifiers, then entered the transcribed texts into the NVivo qualitative data software Version 14 and started the data analysis. I ran a word query of 100-word frequency on the data. After that, I carefully examined the RQs for the study and each item (question) on the semistructured interview guide.

I came up with overarching themes from the data, which helped me respond to the RQs posed by the study. By producing subthemes, categories, and subcategories and clustering them, NVivo software helped with coding and developing emergent themes. This study's findings revealed that different perspectives of the interviewees on the COVID-19 disease led to misunderstandings about their willingness to receive the COVID-19 vaccine, inconsistent results of the diagnosis of COVID-19 disease, and the nature and symptoms of the disease, which were likened to malaria, among others were reasons, advanced to influence hesitancy to the uptake of COVID-19 vaccine by the population. These reasons included their knowledge of the conspiracy theory (that it was a chip to reduce the African population), the infectious nature of the disease (known as a foreign disease), the hot weather in Nigeria widely implied incorrect beliefs about the COVID-19 disease, which are widespread and differing, continue to affect participants' decisions on vaccination.

Interpretation of the Findings

RQ1: What is the relationship between COVID-19 knowledge and COVID-19 vaccine hesitancy among the unvaccinated population between the ages of 18 to 60 years in Nigeria?

RQ2: What attitudes to COVID-19 vaccination can influence vaccine hesitancy among the unvaccinated population between the ages of 18 to 60 years in Nigeria?

RQ3: How do sociocultural (education, occupation, religion, beliefs, culture, ethnicity) factors influence COVID-19 vaccination hesitancy among the unvaccinated population between the ages of 18 to 60 years in Nigeria?

I addressed the RQs with the findings obtained from the data collected and analyzed from the study's participants, who were selected using a purposive sampling technique for the semistructured interview. I discussed the overarching findings from the semistructured interview in relation to the peer-reviewed articles cited, and government and nongovernment publications on the study phenomenon that were reviewed or presented in Chapter 2 of this study. In addition, the overarching findings were examined within the context of the pillars of the HBM upon which the study was grounded to further explore why the participants remained hesitant about COVID-19 vaccination uptake, explicitly focusing on knowledge, attitude, and belief.

Comparison of Findings Literature

In this subsection, I present the study's findings in phases under the pillars of the HBM, the variations in the findings across gender, region, or states, and the research method to confirm, disconfirm, or extend knowledge in public health discipline by

comparing them (findings) with facts in the peer-reviewed literature described in Chapter 2.

Finding 1: Perception of COVID-19 Disease

I confirmed through the study that participants from different geopolitical zones in Nigeria had similar perceptions about COVID-19 disease. The findings suggested that participants had high perceived susceptibility and perceived severity of COVID-19 disease. This is because they all believed that COVID-19 was a serious disease that could kill people. Further, the findings suggested that participants had highly perceived benefits of taking preventive actions to avoid COVID-19 disease. This is because they all believed that taking preventive actions, such as social distancing and wearing a mask, could help them to stay healthy. The findings suggested that participants had positive beliefs and attitudes towards COVID-19 disease prevention. This means that they were more likely to take preventive actions to avoid the disease.

I carried out a cross-gender analysis, which revealed that the three male participants had similar perceptions on COVID-19 disease. They explained that COVID-19 was a respiratory infectious disease contractable by a virus that spreads through bodily fluids and contact with infected surfaces. Its symptoms include the common cold and severe acute respiratory syndrome. To buttress this finding, a male from Benue State said, "My understanding is that COVID-19 is an advanced stage of respiratory infection".

Similarly, the four female participants had the same perceptions of COVID-19 disease. They noted that COVID-19 disease was deadly, and it infects and kills people, especially those of young age and from the age of 50 and above because their immune

systems are not strong enough to fight the disease. To establish this finding, a female from Kaduna State noted that “COVID-19 is deadly because it has affected and killed many people, especially persons aged 50 and above.”

In addition, a related and overlapping pattern emerged when I triangulated the findings across the five geopolitical zones identified in the results or where the participants belonged. The two male participants from the North-Central Zone said that COVID-19 was an advanced respiratory infectious disease. For instance, a male from Benue State said, “My understanding is that COVID-19 is an advanced stage of respiratory infection.”

From the North-West, the participant reported that COVID-19 was a killer disease that targets both young and older adults but kills people 50 years and above. The result is consistent with the South-East finding. For instance, a female from Kaduna State stated that “COVID-19 is deadly. It has affected and killed many people, especially those aged 50 and above.”

From the South-South, the two female participants explained that COVID-19 disease was an infectious virus that can be deadly for individuals who contract it. A female from Cross River State said, “COVID-19 disease is an infectious disease caused by acute respiratory syndrome.” COVID-19 is a typical flu and fever that attacks Nigerians with full force. From the North-East, the male participant from Taraba State answered that “COVID-19 disease is an infectious virus that attacks through body fluids, that was identified in 2019.”

This finding is supported by evidence from peer-reviewed literature. As reported, COVID-19 was initially discovered in December 2019 in the Chinese province of Wuhan (Huang, J. et al., 2020; Michael et al., 2021; Paules et al., 2020), and it has since spread around the world and has become a severe public health risk (Malik et al., 2020; Pal et al., 2020; Wang et al., 2020b). COVID-19, known for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), causes pneumonia, severe respiratory sickness, and death (Zhou et al., 2020). Hager et al. (2020) corroborated that COVID-19 disease shares similarities with the Middle East respiratory syndrome Coronavirus (MERS-CoV) and the previously discovered SARS-CoV.

However, COVID-19 disease outbreaks have developed into a global pandemic. Since the first report of COVID-19 patients in Wuhan, China, in 2020 (Huang, J. et al., 2020; WHO, 2020), the disease has caused significant, previously unheard-of death and morbidity, leading to urgent public health crises (Huang, J. et al., 2020; WHO, 2020). Humans are infected with SARS-CoV-2 primarily by inhaling airborne droplets, close contact with infected individuals, mainly through mucus membrane secretions from the nose, mouth, or eyes, and touching contaminated surfaces, in addition to through the digestive tract (Carlos et al., 2020; Zhang et al., 2020).

Finding 2: Symptoms of COVID-19 Disease

On the symptoms, the study's findings confirmed that participants' views of the COVID-19 disease's symptoms have frequently been the same. Participants from both genders and all geopolitical zones in Nigeria reported similar descriptions of COVID-19 symptoms. The most common symptoms reported were headache, high temperature, sore

throat, persistent coughing, body weakness, sneezing, and fever. The findings suggested that participants were aware of the symptoms of COVID-19. This is important because perceived susceptibility is one of the key factors that influences people's health-related behaviors. If participants believed that they were at risk of contracting COVID-19 disease, they were more likely to take steps to prevent it, such as taking the COVID-19 vaccine. The findings also suggested that the participants perceived COVID-19 to be a serious disease. This is also important, as perceived severity is another key factor that influences people's health-related behaviors. If participants believed that COVID-19 disease is serious, they were more likely to take steps to prevent it.

The results of the cross-gender analysis showed that participants' descriptions of the COVID-19 disease's symptoms were identical for both men and women. The eight male participants noted that symptoms of COVID-19 included headache, high temperature, sore throat, persistent coughing, lethargy, coughing, sneezing, body weakness, sore throats, fever, breathing difficulty, diarrhea, and death. Accordingly, a male from Rivers State said, “The symptoms include a rise in temperature, fever, dried throat, cough, headache, difficulty breathing, and general body weakness.”

The COVID-19 disease symptoms, according to the nine female participants, included sickness, feeling feverish, a dry cough, a generalized weakness of the body, headache, fever, and cough, as well as signs of malaria, such as breathing difficulties, internal cold, and persistent coughing. For instance, a female from Enugu State explained that “you can tell if someone has this disease if you come into contact with them; they

have generalized body weakness, dry cough, nasal congestion, persistent coughing without throwing up anything, and fever."

Similarly, the cross-geopolitical analysis of the results across the five geographical zones showed that participants from all regions reported similar descriptions of COVID-19 symptoms. Participants from North-Central reported that COVID-19 symptoms, included but were not limited to headache, high temperature, sore throat, continuous coughing, loss of smell and shortness of breath, fever, coughing, and shortness of breath, mostly killing older adults, as well as malaria symptoms, including difficulty breathing, feeling cold inside, and malaria.

For the North-West zone, findings reported included feeling feverish, dry cough, and general body weakness. The South-South participants said a rise in temperature, fever, dried throat, headache, sneezing, body weakness, sore throats, breathing difficulty, diarrhea, death, coughing, and coldness were the symptoms of COVID-19. The North-East participants added that common signs and symptoms associated with COVID-19 were fever, cough, tiredness, headache, constant fever, lung disease, asthma, and difficulties in breathing. The South-East participants indicated the general weakness of the body, nasal congestion, dry cough, malaria, headache, difficulty breathing and fever, chills, and coughing consistently.

Accordingly, Zhou et al. (2020) reported that the severe acute respiratory syndrome coronavirus-2, which causes COVID-19, causes asymptomatic infection, fatal pneumonia, severe respiratory disease, and death. Similarly, Elsayed et al. (2022) reported that fever, drowsiness, dry cough, myalgia, and shortness of breath are among

the primary clinical symptoms of COVID-19. The virus was named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) by the International Committee on Taxonomy of Viruses. The WHO pronounced COVID-19 a global pandemic on March 11, 2020 (Cucinotta & Vanelli, 2020; Islam et al., 2021; Michael et al., 2021; WHO, 2020b, 2021), and a public health emergency of international concern on January 30, 2020 (WHO, 2020a).

Finding 3: Experience on COVID-19 Disease

On experience, the findings confirmed and extended knowledge on COVID-19 experience. The participants had varied experiences of COVID-19 disease, with some participants having contracted the disease and others not having contracted the disease. The findings suggested that the participants' experiences of COVID-19 disease may have influenced their beliefs and attitudes about the disease, and thereby their health-related behaviors. For example, the participants who had contracted COVID-19 had higher perceived susceptibility and perceived severity of the disease. This may have led them to be more likely to take preventive measures, such as getting vaccinated and wearing a mask. On the other hand, the participants who had not contracted COVID-19 had lower perceived susceptibility and perceived severity of the disease. This may have led them to be less likely to take preventive measures.

Further, the participants had varied experiences of COVID-19 disease. I grouped these experiences under two categories. The first were participants who had contracted the disease, and the other group had not. In the group of participants who had COVID-19 disease, the cross-gender findings showed that the male participant caught COVID-19

unexpectedly, and the experience did not feel like malaria. The participant could not assign the feeling to a specific symptom. Meanwhile, the COVID-19 disease-related symptoms experienced by the female participant were attributed to fever, a cold, and loss of appetite.

Among the group who had not experienced COVID-19 disease, both the male and female participants argued that they had not experienced COVID-19 disease and its associated symptoms. Further cross-geopolitical analysis findings showed that the two participants who contracted COVID-19 disease were only from the North-Central geopolitical zone. Their experiences represented COVID-19 symptoms such as loss of appetite, fever, chills, and death. Findings from the North-East, North-West, and South-East showed that they had not contracted COVID-19 disease.

In a similar study, Roberts et al. (2021) found that research participants experienced COVID-19 disease. They discussed physical experiences that impacted their health and sense of well-being. Overwhelming weariness, a loss of taste and smell, and neurological and musculoskeletal problems were among the experiences. The participants' psychological/emotional experiences frequently left them feeling angry, ashamed/embarrassed, and anxious. Participants described how fear caused them to lose control, feel alone, angry, ashamed or embarrassed, and stressed.

People now respond to infectious outbreaks and feel anxiety in various ways because of the plague and later pandemics. The anxiety and sense of loss frequently brought on by pandemics present themselves in various ways and serve as a defense mechanism to maintain control. To regain a sense of control over feelings of uncertainty

and loss of control, participants often purchase excessive amounts of goods like toilet paper, paper towels, and disinfectants. The participants spoke of their anger as being both furious with the illness and upset with others.

Finding 4: Others Experience With COVID-19 Disease

On the experience of others, the study findings confirmed and extended knowledge that many participants in the study had seen, heard, or known someone who had suffered from COVID-19. The symptoms reported were similar across geopolitical zones and included fever, malaria, cold, cough, and weight loss. Some participants also reported that people who died from COVID-19 were those who traveled out of Nigeria and contracted the disease abroad. The findings suggested that many participants have a high perceived severity of COVID-19. This is because they had seen, heard, or known someone who had suffered from the disease, and they had witnessed the serious health problems that COVID-19 can cause. The findings also suggested that some participants believed that COVID-19 is a disease that is more likely to affect people who travel out of Nigeria. This belief may lead some participants to avoid traveling, especially when the disease is widespread, which could be a positive health behavior.

Accordingly, I tallied at least six male participants who had seen, heard, or known someone who had suffered from COVID-19. According to the participants, the COVID-19 patients felt sick, feverish, malaria, cold, cough, etc. To substantiate this finding, a male from Rivers State noted that “the infected woman reported malaria symptoms and weight loss. They prayed for God's miracles to heal from common malaria. We never

believe she will die of it". The study's female participants' evidence included the same symptoms.

Similar cross-geopolitical findings on other people's experiences with the COVID-19 condition in Nigeria suggested related results. However, findings from South-South revealed that female participants argued that COVID-19 disease mostly infected people who traveled out and contracted it from abroad before returning to Nigeria. They died on their arrival in Nigeria, where the disease is not rampant. Experiences from geopolitical zones are similar to those who contracted and experienced COVID-19, suffered from the symptoms, prayed for God's miracle, were scared, Etc.

This finding is consistent with Ullah et al. (2021), who found that the migrant population in the host nations is already in a precarious position for various causes. Because of governmental lockdowns, the pandemic has made this vulnerability worse (Avato et al., 2010; Dustmann et al., 2010; Fasani & Mazza, 2020). Migrants are losing their jobs because of movement constraints, which led to their increasing debt. Days go by, and it is sure to become worse. There have been many instances of xenophobia, prejudice, and stigmatization. In other cases, migrants were expelled from their hotels or homes because they were perceived as significant virus spreaders and denied access to stores and restaurants. Migrants and returning citizens both experience prejudice issues as they are labeled as virus carriers.

Finding 5: Perceptions on the Effectiveness of COVID-19 Vaccine

On perceptions on the effectiveness, the study findings confirmed and extended knowledge on the effectiveness of the COVID-19 vaccine. There were two main

perspectives on the effectiveness of the COVID-19 vaccine among the participants. Some participants believed that the COVID-19 vaccine is ineffective, arguing that it did not protect recipients from contracting the disease or even dying from it. Other participants believed that the COVID-19 vaccine was effective, arguing that it prevented the disease or decreased the rate of susceptibility and mortality. The participants who believed that the COVID-19 vaccine was ineffective may have lower perceived benefits and higher perceived barriers to vaccination. They may also have lower self-efficacy for vaccination. The participants who believed that the COVID-19 vaccine was effective may have higher perceived benefits and lower perceived barriers to vaccination. They may also have higher self-efficacy for vaccination.

The cross-gender analysis of the findings revealed that male participants contended that the COVID-19 vaccination was ineffective since it did not protect recipients from contracting the disease after receiving it. Specifically, at least four male participants claimed that the COVID-19 vaccination was ineffective because those who received it developed the disease and died from it. To establish this finding, a male from FCT-Abuja observed that “everyone I watched on TV who gave testimonies about the vaccine complained of the mysterious death of victims who took the vaccine”.

However, female participants held divergent opinions on the efficacy of COVID-19 immunization. Three female participants argued that the COVID-19 vaccination left recipients weak and dizzy for days after receiving it but asserted that their goal of preventing COVID-19 sickness was achieved. To attest to this finding, a female from Anambra State narrated that

> Someone I know who took the vaccine did not complain of anything, mainly negative, but they said they experienced some changes in their body, but it was not for long. After a short period of experiencing time changes, they adjusted to baseline. They said they felt nauseous sometimes, dizzy, and tired most of the time after taking the vaccine for two to three days.

According to two other female participants, even though the vaccine made recipients weak and drowsy, it decreased the number of deaths during the pandemic in their area, which attests to the vaccine's effectiveness. They asserted that the vaccine that rendered recipients feeling lightheaded or faint was removed from circulation. As a result, after a day or two, the COVID-19 vaccine recipient may resume their usual activities. Establishing this finding, a female from Akwa-Ibom State said that "some people who have tried to take the vaccine I think they said the vaccine is working".

Triangulating this finding across the geopolitical zones; the North-Central data showed that participants claimed COVID-19 adversely affected vaccinated persons even after they received the vaccine. Therefore, there was no discernible benefit for those who received the vaccine compared to those who did not. For instance, a male from Nasarawa State stated that "some persons vaccinated still died of the disease, and the number of jabs (vaccine shots) required for protection is uncertain. I believe the vaccine does not elicit the required protection against the COVID-19 virus." Similar findings were observed from the North-East. Participants argued that COVID-19 vaccination was not effective because the vaccine does not protect recipients from contracting the disease,

even dying. They furthered that infected healthcare personnel made patients more susceptible to the illness.

In contrast, data from the South-East and South-South showed that participants believed the COVID-19 vaccine prevented the disease and decreased the rate of susceptibility and mortality. Although the recipient had no complaints, the body's systems had changed. To establish this claim, a female from Anambra State narrated that

> Someone I knew who took the vaccine did not complain of anything, particularly harmful, but they said they experienced some changes in their body, but it was not for long. It was just like for a short period, then soon they adjusted to their routine. Ok, they said they felt nauseous sometimes; they felt dizzy and tired most of the time after taking the vaccine for two to three days.

In line with the ineffectiveness of the COVID-19 vaccine, the WHO declared that since COVID-19 vaccines are not entirely effective, people will still need to engage in preventive behavior (such as wearing masks and keeping a distance) even after receiving the vaccination. It will be crucial to manage expectations and ensure that persons who have received vaccinations do not stop practicing protective behaviors and put themselves and others in danger (WHO, 2020).

In a systematic review and meta-analysis study, Rothschild et al. (2021) found that the efficacy of the vaccinations to prevent symptomatic disease in the elderly group showed no statistically significant difference. Although mRNA-1273 and Gam-COVID-Vac have the highest P-scores (0.899 and 0.816, respectively), indicating more robust protection against severe disease than other vaccinations, no vaccine was statistically and

significant with a lower risk for severe COVID-19 (Rothschild et al., 2021). The BNT162b2 and mRNA-1273 vaccines, which employ mRNA technology, were shown to have the best effectiveness in preventing symptomatic COVID-19 compared to other vaccinations in their indirect comparison. Engage community leaders, influencers, and local organizations to promote health education, preventive measures, and vaccination. Leveraging trusted figures can enhance the credibility of the information shared (Damian et al., 2017).

Finding 6: Herbal Medicine for Treating COVID-19 Disease

The findings confirmed and extended knowledge that there is a variation in the knowledge of herbal remedies for COVID-19 across gender and geopolitical regions in Nigeria. The findings of the study suggested that people who were aware of herbal remedies for COVID-19 may have a lower perceived susceptibility to the disease. This is because they believe that they have a way to treat the disease if they do contract it. However, it is important to note that the study did not assess the efficacy of the herbal remedies that were mentioned. Therefore, it is possible that some of the herbal remedies are not effective in treating COVID-19.

For example, at least 11 participants knew that herbal medication helped treat COVID-19 disease, whether they learned it from personal experience, heard about it from others, or saw it for themselves. In contrast, four participants argued that they were unaware of any herbs or homemade medications for treating COVID-19 disease. According to the cross-gender analysis of the findings among the participants who claimed knowledge of the usage or effectiveness of herbal remedies for treating COVID-

19 disease, seven male participants reported that neem leaves concussion, "Dogon yaro" leaves, mango leaves, Guava, and other plants might be used to cure COVID-19 disease. Here, a male from Plateau State asserted that I am aware of some herbs like moringa leaves, "Dogon yaro" leaves, mango leaves, and Guava. When boiled and steamed, then consumed to cure COVID-19. Similarly, four female participants corroborated this finding and stated that neem leaves, typhoid herbs, Etc., are effective for treating COVID-19. Here, a female from FCT-Abuja affirmed that "she knew of neem tree and bitter kola."

However, the opposite gender group showed a different result. Two male participants stated that they were unaware of using homemade or organic remedies to treat COVID-19. Similarly, two female participants claimed they had never heard of any herbs for the treatment of COVID-19. To buttress this finding, a female from Akwa-Ibom State indicated "she had never heard of any herbs". Also, a male from Taraba State re-echoed the same thoughts mentioned above, saying "he lacked knowledge of herbs as a cure."

An in-depth look into the geopolitical analysis of the results showed that the North-Central and North-West regions had a consensus finding that they were aware of using homemade or natural remedies for treating COVID-19 disease. In contrast, the South-South, South-East, and North-East regions had conflicting findings. While some individuals claimed to be aware of the medicinal properties of herbal medicines in treating COVID-19 sickness, others disagreed.

In a related study, Lin et al. (2020) found that only seven RCTs examining the efficacy of herbal medicine for COVID-19 treatment were identified through a systematic search. The meta-analysis revealed significant effects of herbal medicine and Western medicine co-therapy after the intervention compared to Western Medicine for the total effective rate, disappearance rate (cough and sputum production), TCM syndrome score (cough, fever, dry and sore throat, and fatigue), and complete blood count (white blood cell and lymphocyte counts, lymphocyte percentage, and level of procalcitonin and C-reactive protein; Lin et al., 2020).

Consistent with this finding, Demeke et al. (2021) found that using herbal medication is a viable platform for managing different forms of the COVID-19 virus. The use of herbal medicine and its bioactive fractions as supporting and COVID-19 preventative strategies has the potential to be advantageous. By preventing SARS-CoV-2 multiplication and access into its host cells, many potent herbal remedies can affect COVID-19 pathology. Different plant biochemicals are the most attractive herbal beverage or fruit that may be used as an adjuvant component in the therapy of COVID-19. They can also lower fever and cough, which are COVID-19's most frequent complications because they have an anti-inflammatory impact. Gymnanthemum, Amygdalinum, Azadirachta indica, Nigella sativa, and Eurycoma longifolia are a few examples of herbal items that can be administered. However, several herbal medications, including ginseng, G. glabra, Thymus vulgaris, Allium sativum, and Althea officinalis, may be successful in managing COVID-19 by enhancing the immune system (Demeke et al., 2021).

Finding 7: Individual Preference for Treating COVID-19 Disease

On individual preference, the study findings confirmed and extended knowledge that participants expressed a variety of treatment preferences for COVID-19, including herbal remedies, antibiotics, natural immunity, and vaccines. The different treatment preferences expressed by the participants can be explained by their different beliefs about COVID-19 and their perceived benefits and barriers to different treatment options. For example, participants who preferred herbal remedies may have lower perceived severity of COVID-19 or higher perceived benefits of herbal remedies. Participants who preferred antibiotics may have believed that COVID-19 is a bacterial infection that can be treated with antibiotics. Participants who preferred natural immunity may have believed that the COVID-19 vaccine is ineffective, or that natural immunity is more effective than vaccine immunity. Participants who preferred the COVID-19 vaccine may have had higher perceived susceptibility or severity of COVID-19 or lower perceived barriers to vaccination.

The cross-gender analysis revealed that three male and one female participant agreed that using herbal medicine to treat COVID-19 was preferable. Since homemade medicine is devoid of rumors or conspiracies, they preferred it over the vaccine for the disease. They also said that herbs are more straightforward to use than vaccines and have a more credible reputation. Here, a female from FCT-Abuja added that “she knows of Neem tree and Bitter kola and would recommend it to treat the symptoms, which are the same as other common diseases in Nigeria.”

A group of participants consisting of two males and a female considered antibiotics, not herbs or COVID-19 vaccine, has an alternative treatment regimen for treating COVID-19. They indicated cough syrup or malaria medication. Accordingly, a male from Benue State believes that is what he needs. Considering the condition of COVID-19 as an infection, he would not be hasty for vaccines but would prefer antibiotics.

In another opinion, four female and two male participants argued that they would not recommend or treat COVID-19 disease with local herbs because they are not sure if it is certified as a cure for the virus. Therefore, they preferred taking the vaccine in a registered facility rather than the option. Moreover, since COVID-19 is a foreign disease, it does not need herbal medicine treatment. They are also concerned that the herb could harm any human organ when consumed because it is not medically processed.

In a different preference, two male participants opted for natural immunity as a treatment regimen for the disease and declined the use of the COVID-19 vaccine or herbal medicine. This choice is based on their observed ineffectiveness of the COVID-19 vaccine, which made no difference between them and recipients of the COVID-19 vaccination. For example, a male from Taraba State said “I have strong immunity and will handle the illness without a problem. Natural immunity (immunity after natural infection) is better than vaccine immunity.” The last group is male and female participants who preferred the COVID-19 vaccine despite hesitating to receive it. According to them, a male from Delta State said “vaccination is the only control he could look at now because we are always together in Africa, and there are no face masks”.

Panyod et al. (2020) confirmed that participants prefer nutrition (boosting immunity) and herbal medicine. Nutrition is used to treat coronavirus; for example, treating influenza with very high doses of vitamin C has been used for decades. Since they all belong to the same coronavirus family, the common cold, SARS-CoV-1, and SARS-CoV-2 are considered the same viral type. Therefore, clinical research is needed to determine whether vitamin C is beneficial against COVID-19. Evidence suggested that vitamin D reduced the probability of COVID-19 breakout during the winter when 25(OH)D levels are often low. Intake of vitamin D may lower the incidence of COVID-19 and influenza infections and the associated mortality (Panyod et al., 2020).

In addition, numerous foods and plants have been shown to have antiviral and immunomodulatory properties. There have been reports of the immunomodulatory effects of Aloe vera, Angelica gigas (Korean angelica), Astragalus membranaceus (Mongolian milkvetch), Ganoderma lucidum (lingzhi fungus), Panax ginseng, and Scutellaria baicalensis (Chinese skullcap) (Panyod et al., 2020). The bioactive ingredients of foods and plants have been reported in several studies to be effective against the influenza virus and SAR-CoV-1 despite only being tested in vitro, in vivo, and in ovo. Since most clinical investigations have been done on food and herb combinations or traditional Chinese recipes, very few studies have been conducted on the benefits of particular foods and herbs against the influenza virus and SAR-CoV-1 (Panyod et al., 2020).

Consistent with the findings, Huang, C et al. (2020) reported a long history of using natural items and herbal remedies to treat respiratory infections, and many of them have been licensed as medications, over-the-counter foods, or food additives. These

goods' safety characteristics are typically adequate. Natural products and herbal medications are excellent preventive choices for long-term usage due to low toxicity (Huang, C. et al., 2020). Various natural compounds have been discovered to be highly effective in suppressing the human coronavirus's enzyme function and membrane receptors based on recent in-silico research. Such bioactive chemicals may be moderately dosed to prevent or at least delay the SARS-CoV-2 infection process. Anti-inflammatory herbs will be a viable method to reduce such catastrophic symptoms because the evolution of COVID-19 is also characterized by uncontrolled inflammation, such as cytokine release syndrome (Huang, C. et al., 2020).

In contrary findings, Tahir et al. (2021) found that most respondents (70.8%) said they would take the COVID-19 vaccine if it were accessible, and 66.8% said they preferred vaccination. Significant factors impacting the acceptability of the COVID-19 vaccine include monthly household income, education level, and self-diagnosis of the disease or a diagnosis from a friend, family member, or coworker (Tahir et al., 2021). One of the main arguments against vaccination was the assumption that people are inherently resistant to COVID-19. When mandated by the government, less than half (48%) of those who reject will vaccinate themselves (Tahir et al., 2021).

Finding 8: Knowledge Influencing Hesitancy to COVID-19 Vaccine Uptake

The study findings confirmed that there is a lot of controversial knowledge about COVID-19, which is influencing participants' hesitancy to uptake the COVID-19 vaccine. Perceived susceptibility is one of the key constructs in the HBM. Perceived susceptibility refers to the individual's belief that they are at risk of contracting a disease.

The participants who expressed doubts about the existence of COVID-19 or who believed that it is not a serious disease have lower perceived susceptibility. This is because they do not believe that they are at risk of contracting COVID-19.

Findings from the North-Central region of Nigeria affirmed that there is controversial knowledge of COVID-19, influencing hesitancy to uptake the COVID-19 vaccine. Findings among the male participants showed that some believed the disease to be a lethal, contagious virus. A male participant countered that the illness was no more severe than malaria. Another participant, a man, asserted that it was a manufactured chip used to manage the African population. Yet still, another male participant challenged the cause of COVID-19 disease and contended that it is untrue because no diagnosis supporting its presence has been made. The results of the tests performed in the medical laboratory on the afflicted individuals have been inconsistent. Similarly, a female participant from the same area claimed that COVID-19 is a big guy's disease because it primarily affects rich men in Nigeria.

From another geopolitical zone, the South-South, findings were controversial on COVID-19, influencing hesitancy to the COVID-19 vaccine. A male participant stated that "white men orchestrated COVID-19 to reduce the population and make money from the vaccine sales." A female Cross River State participant argued that "COVID-19 is an imported disease." Thus, it only attacked the rich, not the poor. Further argument from this region further claimed COVID-19 cannot survive in hot weather such as Nigerian weather, and thus, the COVID-19 campaign was politically motivated in Nigeria.

In North-East Nigeria, a male participant from Taraba state argued that “there is no COVID-19 in Nigeria.” The symptoms attributed to COVID-19 are malaria symptoms, which include muscle pain, headache, pink eye, nausea, etc. He, however, claimed that COVID-19 was propagated politically to siphon funds from the government. Another view from a male participant attested that COVID-19 cannot survive in Nigeria due to the hot weather, which explains why many people do not believe in its existence in Nigeria. In the South-East, a female participant from Enugu State attested that “there is controversial knowledge on COVID-19 disease.” While some people believe COVID-19 is inaccurate, some believe it is malaria, and others think it is not curable. Meanwhile, others viewed it as a disease of older people.

The above findings are consistent with scholarly findings and posit that a critical obstacle to community-wide acceptance of COVID-19 vaccination is false or contradictory information (Adetayo et al., 2021). Also, health-related factors (such as risk perception, severity, knowing someone who has COVID-19, having co-morbidities), as well as vaccine-related knowledge (vaccine confidence, source of information, perceived vaccine), according to MacDonald (2015) are directly related to vaccine hesitancy. Further, pre-existing medical conditions influence COVID-19 vaccine hesitancy (MacDonald, 2015; Murphy et al., 2021; Samarasekera, 2021).

Similarly, Adane et al. (2022) found that compared to healthcare workers (HCWs) who had positive perceptions of COVID-19 vaccinations, those with negative perceptions were 4.73 times more likely to refuse the vaccination. Contrary to other HCWs, being a nurse or midwife (which determines the level of participants' knowledge) was

substantially related to receiving the COVID-19 vaccination. Most pharmacists declined vaccinations, but the relationship was not statistically significant (Adane et al., 2022). Also, Beleche et al. (2021) found that the likelihood of being hesitant was lower for individuals with college degrees than for those without one, and this difference grew with time for most categories.

Finding 9: Sociocultural Factors Influencing Hesitancy to COVID-19 Vaccine Uptake

On sociocultural factors, the study findings confirmed and extended knowledge that there is no conclusive evidence that culture or religion has a significant influence on vaccine uptake in Nigeria. However, individual decisions and the influence of family and friends appear to be more important factors. The findings suggested that individual decisions and the influence of family and friends are more important factors in vaccine uptake than culture or religion. This is consistent with the HBM construct of perceived benefits. Individuals are more likely to take preventive action if they believe that it will benefit them and if they have the support of their family and friends. The findings also suggested that perceived barriers may play a role in vaccine uptake. For example, some participants reported that they were hesitant to get vaccinated because they believed that the vaccine was ineffective or that it was not culturally inclined. These are all perceived barriers to vaccination.

The cross-geopolitical and gender analysis of the evidence on the influence of the determinants on vaccination uptake, however, did not turn up any conclusive evidence. In substantiating the assertions on cultural factors, the North-Central findings confirmed that culture has an impact on the uptake of the vaccine. Two male participants disagreed on

the use of the vaccine and claimed that it was not culturally inclined. They believed herbs should be used to treat the disease because the symptoms are synonymous with malaria and other known diseases, ever treated with herbs. More so, the disease is for rich people, which makes many people reject the vaccine as the disease does not affect poor people.

The North-West findings argued against cultural influence. A female participant from Kaduna State did assert that culture has no influence on hesitancy to vaccine uptake but an individual's decision that influences hesitancy to the vaccine. Similarly, North-East findings are unanimous on culture. Findings revealed that culture does not influence vaccine uptake. However, other reasons influenced hesitancy among the people. A male participant from Taraba argued that people generally acclaimed COVID-19 as a disease for the rich, not the poor. More so, it is not an African disease, and the affected rich people are those who traveled to the white men's countries. Another male participant from Kaduna State said that culture does not affect vaccine uptake because indigenous people have received various vaccines for a long time.

Regarding the influence of family and friends on the participants' hesitancy to COVID-19 vaccination uptake, there is a consistent finding across the geopolitical zones of the participants. For instance, findings from the North-Central availed that the influence of family and friends is not common because it is usually a personal decision. South-South findings collaborated that individual decisions prevail in taking the vaccine or not. Similarly, South-East findings attested that while it is an individual decision, no family member has taken the vaccine because it is considered ineffective. This finding is synonymous with the North-East geopolitical zone results.

Regarding the impact of religion on hesitation to receive the COVID-19 vaccinations, participants from all geopolitical zones had agreed that their religious affiliation, for example, Christianity, had no adverse effects on their decision to receive the vaccination. Almost every participant noted that their religion had provided an environment that made getting the vaccine possible for them. The church authorities made the vaccination uptake announcement during church services. They arranged with health officials to bring the vaccination location into the church setting to make it easier for church members to receive the vaccinations. Only two individuals claimed that their church did not speak about the vaccine; nonetheless, they did not feel that the church hurt their decision to receive the vaccine.

A body of evidence has shown that factors such as socio-demographics (for example, sex, age, education, income, and occupation) and health-related problems (for example, risk perception, severity, knowing someone who had COVID-19, having co-morbidities) are factors influencing COVID-19 vaccine hesitancy (Khubchandani et al., 2021; Lazarus et al., 2021; Murphy et al., 2021; Razai et al., 2021a; Sallam, 2021). Further evidence confirmed that participants in Nigeria's three primary religions, Christianity, Islam, and Traditional Religious Practices or Atheists, did not differ in their attitudes towards vaccination. Religion did not have as much of an impact on vaccine attitudes as ethnicity did (Ojewale et al., 2022). Men receive the COVID-19 vaccine because they make more independent decisions concerning their health than women.

Wang et al. (2020b) believe that male participants in China were more inclined to receive the COVID-19 vaccine. In a Polish study, males were more likely than females to

accept a vaccine (Neumann-Bohme et al., 2020). Ethnicity impacted people's attitudes, which were linked to ethnic preferences in treating sick people, such as using herbs among the Yorubas in Nigeria. Beleche et al. (2021) found that disparities in intent to receive the COVID-19 vaccine remain amongst racial and ethnic groupings, ages, educational levels, socioeconomic status, and geographic regions.

Finding 10: Attitude Influencing Hesitancy to COVID-19 Vaccine

On attitude, the study confirmed and extended knowledge that participants from all geopolitical zones in Nigeria were hesitant to receive the COVID-19 vaccine. This was due to a variety of factors, including (1) belief in conspiracy theories about the vaccine, (2) lack of perceived benefit from the vaccine, (3) concern about the side effects of the vaccine, and (4) belief in natural immunity. The participants had a variety of beliefs and attitudes about the COVID-19 vaccine that were consistent with the HBM. For example, some participants had low perceived susceptibility to COVID-19, low perceived severity of COVID-19, low perceived benefits of the vaccine, and high perceived barriers to vaccination.

The results from the cross-gender and cross-geopolitical analysis showed that participants were hesitant to receive the vaccine, as evidenced by results from the North-Central that demonstrated the people were still hesitant about receiving the vaccine. A male participant from FCT-Abuja revealed his fervent belief in a conspiracy against the vaccine. A female participant from Benue State claimed that “individuals who received the vaccine did not experience any beneficial changes”. Regardless of how many shots

one receives, protection remains to be determined, remarked a male participant from Nasarawa State.

The results from the South-South were similar to those from the North-Central. No dialogue can make me change my mind about receiving the vaccination, the participant from Delta had insisted. According to a male participant from River State, "There is no need for the vaccine because his natural body immunity is sufficient, and if God cannot heal him, then the vaccine cannot heal him either". Similarly, findings from the North-East and South-East share a similar opinion on their natural immunity providing needed protection. Participants debated the validity of the vaccine's claims to boost immunity or provide protection against COVID-19 disease. They inferred a lack of benefit from vaccine uptake because it cannot cure the COVID-19 disease or protect the receiver from contracting it. They believe it causes the recipient to feel discomfort for about three days and prevents such from engaging in valuable activities that would have enhanced his/her standard of living.

In a related finding, Cordina et al. (2021) reported that participants doubting whether to receive the vaccination requested additional details. Different views that showed a general lack of confidence in vaccinations were displayed by those who were categorically unwilling to get the vaccine. Also, many of the participants' perspectives impact vaccination uptake considerably. There was a significant positive relationship between the desire to receive the vaccination, the significance placed on friends' and family's opinions, and the value placed on medical professionals' recommendations.

Males were more inclined than females to value medical professionals' guidance on the efficacy of the vaccination.

In corroborating these findings, Khan et al. (2022) found that four participants reported having anti-vaccination attitudes and not believing in COVID-19, while a few others said they were hesitant to get the vaccine since there are alternative ways to protect themselves, such as maintaining distance, routine hand washing, the use of hand sanitizers, and masks. The participants believed that the COVID-19 virus is identical to the influenza virus and that the latter is fast mutating its genetic makeup, making vaccines ineffective. As a result, they claimed that the vaccination would not be successful in reducing the spread and intensity of the virus.

Finding 11: Other Factors Influencing Hesitancy to COVID-19 Vaccine Uptake

The study confirmed and extended knowledge that several factors contribute to vaccine hesitancy among the participants in this study, including (1) concerns about the safety of the vaccine, (2) beliefs about the ineffectiveness of the vaccine, (3) concerns about the rapid production of the vaccine, (4) concerns about the attitude of healthcare workers, (5) concerns about the availability and accessibility of the vaccine, and (6) conspiracy theories about the vaccine.

The factors that contributed to vaccine hesitancy among the participants can be linked to a number of the domains in the HBM. Concerns about the safety of the vaccine and beliefs about the ineffectiveness of the vaccine can be linked to perceived barriers. The participants believed that there were obstacles to taking the vaccine, such as concerns about its safety and effectiveness. Concerns about the rapid production of the vaccine and

concerns about the attitude of healthcare workers can be linked to perceived barriers. The participants believe that there are obstacles to taking the vaccine, such as concerns about the speed of its development and the attitudes of healthcare workers. Conspiracy theories about the vaccine can be linked to perceived susceptibility and perceived severity. The participants believed that they were more susceptible to the vaccine's side effects than to the virus itself, or that the vaccine is more dangerous than the virus itself.

The cross-gender analysis of the findings revealed that two men and two women from North-Central and South-South regions concurred that the vaccination was a chip the Western World had manufactured to lower the population of Africa. It is either the antichrist's mark or a chip for the Cold War. Others claimed it is a chip designed to reduce male fertility and prevent conception as a population control measure. To substantiate this finding, a male from Rivers State had cautioned never to accept the vaccine, primarily if targeted towards fertility. Also, a male participant from Plateau State went as far as to say that vaccines are the mark of the antichrist or the mark of the beast. Similarly, findings from two male and two female participants in the North-Central, North-East, and South-South regions showed that the vaccine did not affect the black population since they are immune against the disease. A male participant from Nasarawa state argued that a label on the vaccine instructed that it should not be administered in Europe or America, which raised trust concerns.

Nine participants, consisting of seven male participants and three female participants from South-South, North-West, North-Central, and North-East, asserted that death is never a reason to influence them to receive the vaccine. They believed that death

was inevitable, and they worried that the effect of the vaccine may extend beyond death. According to the participants, a male from Rivers State adds that death was never a sufficient reason to take the vaccine. You can fact-check me; all the projections about Africa died on arrival. More so, they commented that the vaccine may harm their health because several people have died after receiving it, making them hesitant to become compliant.

Other important factors include the attitude of healthcare workers, ineffectiveness of the vaccine, vaccine production time, fraudulent or corrupt practices, and availability and accessibility of the vaccine, which are cross-gender and cross-geopolitical findings that receive consensus comments from the participants. Specifically, three male participants from North-Central raised concern about the rapid production of the vaccine within a short period of the disease being declared a pandemic. They believe vaccine production typically requires more time than manufacturing the COVID-19 vaccine.

Also, eight participants consisting of four male and four female participants across the five geopolitical zones lamented the ineffectiveness of the vaccine. They argued that the vaccine failed the purpose meant to achieve. A male from Nasarawa State commented that my personal belief is that the vaccine does not elicit the required protection against the COVID-19 virus. The vaccine does not protect 100 %. As such, I do not trust the efficacy of the vaccines.

Scholarly evidence corroborated these findings that COVID-19 vaccination hesitancy exposed more people to infectious diseases and the advancement of sickness among those already ill (Afolabi & Ilesanmi, 2021). Research indicates that other

vaccine-related issues (such as vaccine trust, source of information about vaccines, perceived vaccine efficacy, safety, and adverse effects) all affect vaccine hesitancy (Lazarus et al., 2021; Murphy et al., 2021; Sallam, 2021; Samarasekera, 2021). Also, political variables are significant determinants of vaccine hesitation, including faith in vaccine developers, the vaccine approval procedure, the vaccine country of origin, and recommendations (Kreps et al., 2020; Tobin et al., 2021).

According to researchers, the respondents' top attitudes that prevent them from taking the COVID-19 vaccine include concerns about unintended consequences, a preference for natural immunity, widespread distrust of the benefits of vaccines, and worry about corporate profiteering (Adetayo et al., 2021). Factors influencing vaccine acceptance include general mistrust of expected health benefits, the safety of vaccines, concerns about unanticipated effects, and specific knowledge of vaccines that would affect the desire to vaccinate (Adetayo et al., 2021; Paul et al., 2021).

In a similar finding, Adane et al. (2022) found that nearly half (46.9%) of the HCWs believed that vaccinations may exacerbate any underlying medical issues. However, 44.1% of the respondents believed that without vaccinations, it would not be able to lower the prevalence of COVID-19 (Adane et al., 2022). The respondents based their opinion on the COVID-19 vaccine's ability to protect against the disease and its safety enhanced people's willingness to be vaccinated. According to the bivariable regression analysis, assuming that the vaccine has side effects or poses more risks than standard vaccinations reduces one's desire to receive vaccinations (Adane et al., 2022).

Findings in the Context of the Theoretical Framework

In this sub-section, I analyzed and interpreted the study findings based on the framework of the HBM. It involved discussing the key findings concerning the six components (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy) of the HBM to establish further the nexus between the findings and the theoretical underpinnings of this study.

Finding 1: Perceptions, Symptoms, Experiences, and Others' Experience of COVID-19 Disease

The findings revealed different perspectives held by the participants on the COVID-19 disease and its highly contagious nature, which aided in its pandemic globally. Although not all the participants have contracted COVID-19, they are all aware of the disease and its highly infectious nature. They described COVID-19 symptoms to include temperature, sore throat, persistent coughing, lethargy, coughing, sneezing, body weakness, sore throats, fever, breathing difficulty, diarrhea, and death. Even though not all the participants have contracted COVID-19, they are all aware of the disease's highly infectious characteristics. They described COVID-19 symptoms to include sore throat and persistent coughing, lethargy, coughing, sneezing, body weakness, sore throats, fever, breathing difficulty, diarrhea, and death.

The fact that the participants were all aware of COVID-19 and its highly contagious nature suggested that they had high perceived susceptibility and perceived severity. This is an important finding, as it means that the participants were more likely to be motivated to take preventive actions against COVID-19, such as getting vaccinated

and wearing a mask. According to Groenewold et al. (2006) and Tarkang and Zotor (2015), when people believe they are susceptible to an illness, they are more likely to take the required precautions to prevent it.

Finding 2: The Effectiveness of COVID-19 Vaccine

Findings revealed that despite having different arguments, the participants' opinions on the COVID-19 vaccine's effectiveness were the same. The opinions were from their (participants) observations of people who had received the vaccination and had harmful side effects in their bodies. In a similar view, they claimed that whether someone received the vaccination made no difference because they may still be susceptible to COVID-19 infection.

The participants' concerns about the safety and effectiveness of the COVID-19 vaccine are related to the HBM domains of perceived risks and benefits. Perceived risks are the individual's belief that taking a preventive action will have negative consequences. Perceived benefits are the individual's belief that taking a preventive action will have positive consequences. The participants who expressed concerns about the safety of the COVID-19 vaccine have high perceived risks of vaccination. They believed that vaccination could have harmful side effects. The participants who expressed concerns about the effectiveness of the COVID-19 vaccine have low perceived benefits of vaccination. They believed that vaccination does not prevent COVID-19 infection.

Finding 3: Herbal Medicine and Preference for Herbal Medicine for Treatment of COVID-19 Disease

Findings confirmed that participants acknowledged that herbal medication helped treat COVID-19 disease, whether they learned it from personal experience, heard about it from others, or saw it for themselves. The herbs include Neem tree, Dongo yaro (Moringa), Ogogoro (local gin), bitter kola, Moringa leaves, Mango leaves, and Guava. These herbal concussions are treatment affirmations based on personal experience or things they have learned or witnessed from others that serve as prompts to take action in the fight against COVID-19 disease.

This finding connects to the perceived benefits domain of the HBM. Perceived benefits refer to the participant's belief that taking preventive action such as the receipt of the COVID-19 vaccine, will benefit them. The perceived benefit associated with utilizing herbal medicine was highly valued by participants who thought herbs could help treat COVID-19 disease. This is because they thought that herbal remedies could help them recover from COVID-19. According to Wagle (2022), a person's course of action to prevent (or treat) sickness depends on thought, evaluation of one another's evaluated susceptibility, and perception of advantage; for example, if the COVID-19 vaccination uptake is considered favorable, a person would choose that course of action.

Finding 4: Knowledge Influencing Hesitancy to COVID-19 Vaccine Uptake

The participants differing perspectives on COVID-19 included knowledge of the conspiracy theory that it was a chip to reduce the African population, the infectious nature of the disease known as a foreign disease, and the hot weather in Nigeria. These

factors widely implied these incorrect beliefs about the COVID-19 disease, which, unfortunately, widespread and differing, affected participants' decisions on vaccination uptake. Others are inconsistent results of the diagnosis of COVID-19 disease; the nature and symptoms of the disease were likened to malaria and other diseases advanced to influence reluctance in the population's uptake of the COVID-19 vaccine.

The misconceptions about COVID-19 that participants highlighted were likely to affect participants' perceptions of susceptibility, severity, benefits, and barriers to COVID-19 vaccination. For example, participants who believed that COVID-19 was a foreign disease or that Nigeria's hot weather would kill the virus had lower perceived susceptibility and perceived severity of COVID-19. They also had lower perceived benefits of vaccination and higher perceived barriers to vaccination. As posited by the perceived severity of the HBM, unless one is aware that developing a disease will have health and social repercussions, realizing one's susceptibility to a problem or condition does not always encourage one to take the appropriate preventive measures (Groenewold et al., 2006). Perceived severity furthers that people must regard COVID-19 as a severe disease with substantial effects and consequences on their bodily and social lives (such as morbidity, disability, and mortality) before they will be encouraged to adopt appropriate preventative measures against COVID-19 disease (Groenewold et al., 2006).

Finding 5: Sociocultural Factors Influencing Hesitancy to COVID-19 Vaccine Uptake

Findings confirmed that culture, religion, personal choice, and family and friends are the four major sociocultural elements influencing people's hesitation to receive the COVID-19 vaccine. While there are divergent views among the participants, there is a

consensus that religion has no influence on the hesitation to receive vaccination and that the decision to receive vaccination is a matter of personal choice for the participants. However, there are divergent opinions regarding the impact of culture on people's reluctance to receive vaccinations.

The four sociocultural elements identified in the findings can be connected to the HBM in the following ways: Lack of trust in the government and the healthcare system can influence participants' perceived susceptibility to COVID-19, their perceived severity of the disease, and their perceived benefits of vaccination. For example, the participants who did not trust the government believed that they were less susceptible to COVID-19 than the government claims, or that the vaccine is not safe or effective.

Misinformation and disinformation influenced participants' perceived susceptibility, perceived severity, perceived benefits, and perceived barriers to vaccination. For example, participants who had been exposed to misinformation about COVID-19 believed that they were less susceptible to the disease than they are, or that the vaccine is more dangerous than it is. Cultural beliefs and practices influenced participants' perceived susceptibility, perceived severity, perceived benefits, and perceived barriers to vaccination. For example, participants who came from a culture that had a history of medical racism were hesitant to trust the healthcare system or to get vaccinated.

Personal choice influenced participants' perceived susceptibility, perceived severity, perceived benefits, and perceived barriers to vaccination. For example, an individual who believed that they were not at risk of contracting COVID-19, or that the

vaccine is more dangerous than the disease, chose not to get vaccinated. According to the model, several obstacles may influence people's choices of action. Perceived barriers are perceived obstacles to action, like getting vaccinated against COVID-19. It refers to a person's perspective on the risks of receiving the COVID-19 vaccine (Groenewold et al., 2006).

Finding 6: Attitudes Influencing Hesitancy to COVID-19 Vaccine

Almost all of the participants in the study were hesitant to receive the COVID-19 vaccine because their pre-existing beliefs, thoughts, observations, and experiences surrounding COVID-19 or the vaccine predominated in their minds. Perceived susceptibility and perceived severity are two of the key constructs in the HBM. The participants have low perceived susceptibility to COVID-19 or low perceived severity of COVID-19. This may be due to their pre-existing beliefs, thoughts, observations, and experiences surrounding COVID-19 or the vaccine. For example, they believed that COVID-19 is not a serious disease or that they are not at risk of contracting COVID-19.

Finding 7: Other Factors Influencing Hesitancy to COVID-19 Vaccine Uptake

Conspiracy theories, death, health concerns, infertility, media, attitudes of healthcare professionals, the ineffectiveness of the vaccine, vaccine production time, selling of the rights to produce the vaccine, lack of availability and inaccessibility of the vaccine, and long wait times involved in receiving the vaccine are all perceived barriers to COVID-19 vaccine uptake. The findings suggested that participants had negative beliefs about the COVID-19 vaccine, which prevented them from getting vaccinated.

These negative beliefs include concerns about the safety of the vaccine, its effectiveness, and its availability.

Perceived barriers are perceived obstacles to action, like getting vaccinated against COVID-19. It refers to a person's perspective on the risks of receiving the COVID-19 vaccine. The model proposes that the individual evaluates the initiatives' efficacy in contrast to beliefs that they might be expensive, risky (for instance, side effects, iatrogenic outcomes), unpleasant (for instance, painful, challenging, upsetting), inconvenient, time-consuming, or result in untimely death (Janz & Becker, 1984). Costs, difficulty, discomfort, phobic reactions, accessibility problems, psychological and physical limitations, and personality traits are some of the perceived barriers to engaging in preventative activities (Agha et al., 2001; Rosenstock et al., 1988). Additional perceived barriers include costs, duration, the complexity of the required behaviors, and the availability of resources enabling starting and maintaining the essential activities (Polit & Hungler, 1999).

Limitations of the Study

The study's conduct experienced several limitations. First, unvaccinated persons between the ages of 40 and 60 with a stable source of income had a negative response to the study. Several of them chose not to participate in the study because they did not want to be bothered and claimed to be preoccupied with their careers. The time difference between the United States (US), where I reside, and the study participants (Nigeria) was six hours. Meeting with a participant at convenient hours was challenging because it was either too early on my side or too late overseas.

The sample distribution or selection was biased. Most of the participants ranged in age from 25 to 38. This age group was enthusiastic about participating in the study, even though the older and younger groups did not think it was worthwhile. Also, a vaccination scheme expressly excludes non-government employees in Nigeria. Government employees needed to be immunized; otherwise, they would not be allowed to report to work during the lockdown. Except for compromised individuals, those who needed to keep their jobs received vaccinations.

Completing my "thank you gift" through Boss Revolution Corporation (BRC) proved more difficult than I had anticipated. After I made seven purchases, the bank started to question the frequency of my purchases. They issued numerous bank alerts via emails, messages, and phone calls to me. I acknowledged being aware of the transactions, but further purchases were prohibited. The bank informed me that there were enough purchases for one day. Redeeming my promise was prolonged; I became anxious, afraid to be labeled negatively, as this exceeded the date set for the delivery of the thank-you gift. Furthermore, the BRC sent only data (usable for 30 days) rather than plans that include phone minutes and data for some of the purchases made. Requests to convert Data to cell minutes or refund monies immediately were not honored. I made additional purchases spanning out on multiple days. I disputed the data transactions through my bank and fortunately, I was reimbursed.

It took much work for the participants to access infrastructure facilities, including electricity, the internet, other communication tools, and suitable interview locations. In Nigeria, the electricity supply was constantly epileptic, resulting in participants' mobile

phones or computer batteries not being electively charged or having low battery levels, which interfered with the conduct of the study's interviews. I occasionally postponed interviews because of blackouts or anxiety mode during interviews, as the phone might be out of charge. it occurred twice, unfortunately. I lost some potential recruits because of the phone losing power; the participant was not online when scheduled, or the phone switched off to conserve power and data. Similarly, the participants' plan's allocation of internet service could have been more manageable. Some participants complained about their internet connection's slowness. The lengthy interview of 45 minutes lasted longer than their allotted data time.

Recommendations for Future Research in Nigeria

This qualitative study explored the perceptions of the knowledge and attitudes towards hesitancy regarding COVID-19 vaccination uptake among unvaccinated people ages 18-60 years in Nigeria. The participants in this study were all educated and Christians. Gaps exist as no other faith (Muslims or atheists) participated. Future research must address the study phenomenon among the uneducated and Muslim or atheist populations to understand why they are hesitant to receive COVID-19 vaccination. The study may serve as a comparison analysis in understanding the intricacies surrounding the two participant groups' hesitation towards receiving COVID-19 immunization and assist in designing necessary interventions to address COVID-19 vaccine uptake challenges in Nigeria.

Further, future research is required to investigate the phenomenon under study using different methodological approaches, such as mixed methods or quantitative

analysis, so that the participants' responses can be quantified and analyzed for inferential analysis, further establishing this study finding among the target population. Future clinical research should also obtain the nutritional and biochemical components of the herbal medicine participants described in this study to examine how they can cure viral infections like COVID-19. The results of this study will contribute to proving the efficacy of herbal medicine in treating COVID-19, as suggested by the study's participants.

Implications

Implications for Positive Social Change

The study's findings showed that the COVID-19 disease was generally recognized. However, COVID-19 vaccination knowledge and attitude could have been more positive. To help the public comprehend the complexities surrounding the disease and the treatment of the disease, the Nigerian Ministry of Information should implement appropriate communication mechanisms to educate the public about the COVID-19 vaccine and vaccination uptake.

Through the Ministry of Health, the Nigerian government should step up efforts to train healthcare staff in the utilization of universal precautions, vaccination skills, healthcare education, and management so they will understand the necessary system structures needed when conducting vaccination activities. It may help address the issues surrounding the healthcare service delivery barriers limiting the uptake of the COVID-19 vaccination. Health workers can use these measures to encourage proper hygiene when administering the COVID-19 vaccine. The management of local health authorities should

comprehend pertinent aspects when locating and localizing vaccination facilities to increase public access to and availability of the COVID-19 vaccine in communities.

The Nigerian government, through collaboration with the Ministry of Health and the Ministry of Planning and Budgeting, should make an effort to conduct a COVID-19 vaccination post-evaluation study across the six geopolitical zones to document the success, barriers to uptake, and facilitators and enablers of COVID-19 vaccination uptake. It could support the Ministry of Health's initiatives to develop corrective strategies for addressing hesitancy toward COVID-19 immunization uptake and offer crucial information required to carry out future vaccination interventions for the populace.

The Nigerian Federal Ministry of Health, in collaboration with the State Ministry of Health, should optimize the routine immunization program run at the state and local levels to increase public awareness of COVID-19 disease and vaccine vaccination and consequently reduce hesitancy to the COVID-19 vaccine. Adhering to the COVID-19 Science Advisory suggestions may encourage vaccination uptake, such as outlining the process of vaccine creation, normalizing fear, recognizing healthcare workers who have decided to be vaccinated, and providing simple access to vaccination, Etc. These sensitization efforts should concentrate on educating and reassuring the public, particularly adult men and women, work or social groups, by giving additional information regarding the safety of the COVID-19 vaccination.

Contributions to the Field of Public Health

Public Health Practitioners' primary task is to represent our communities by tackling emergent health problems and improving health. Emergent diseases such as COVID-19 pose serious public health challenges. Evidence-based approaches such as vaccines and personal protective equipment have been developed to counter the rising trend of the COVID-19 threat. Unfortunately, the issue of hesitance inhibits the general acceptance of vaccines scientifically proven to improve immunity against COVID-19 disease. In Nigeria, for instance, Lain and Vishwanath (2022) reported, "The Country's vaccination campaign is in a race against vaccine hesitancy."

The approaches discussed below will assist public health practitioners in the field to better understand the study phenomenon and design appropriate interventions to manage the COVID-19 disease.

Improved Communication & Dissemination: In this era of advanced technology, effective communication can be leveraged through trusted social media platforms such as blogs, Chart Rooms, WhatsApp, LinkedIn, Facebook, and Twitter to enhance the credibility of shared information to the target audience (Damian et al., 2017). Disseminating information directly to the target audience establishes trust, educates the people, and creates awareness with positive feedback.

Information should be transparent to avoid historical mistrust, as in the case of the USPHS Syphilis Study at Tuskegee in 1932 (CDC, 2022a). Presenting information that includes scientific data in a simple format and language that is easy to understand for verification will rekindle trust in vaccine programs (CDC, 2022a).

Education and Empowerment: Developed materials should be deliberate and culturally sensitive. Provide educational materials that explain the disease, transmission, and preventive measures in clear and accessible language. Supporting individuals with the knowledge to make informed decisions about their health is essential and gives them the feeling of being part owners.

Community Engagement: Establishing partnerships, engaging in town hall meetings, observations, and conducting community-based interviews and surveys with stakeholders, healthcare providers, philanthropists, non-governmental organizations, and public health practitioners will promote active participation and acceptance of preventive measures such as vaccination (CDC, 2022d).

Resource Distribution Centers: Collaborating with the three tiers of government (Federal, State, local) and non-governmental/local organizations to set up social infrastructures such as primary health centers to provide access to health care, transportation services, and resource distribution (vaccine availability) is highly beneficial to the success of community programs. Other health resources include hotlines, counseling services, and coping strategies, which can lead to a change in altitude and break down hesitance.

Implementation, Monitoring & Evaluation: Public Health Professionals (PHP) may partner with the Center for Disease Control & Prevention to access global technical tools, guidance, and policy on COVID-19 vaccinations and disease management strategies (CDC, 2022b). The Center for Diseases Control (CDC), through their COVID-19 International Vaccine Implementation and Evaluation Program (CIVIE), supports

partner organizations under seven priority areas specifically to regions, namely: vaccine policy development, program planning, vaccine confidence and demand, data management and use, workforce development, vaccine safety, and evaluation (CDC, 2022b).

The issue of vaccine hesitance falls under implementation. The technical tools program will assist with vaccine implementation challenges, opportunities, and applicable lessons learned from prior experiences with Ebola and influenza, where vaccines were introduced (CDC, 2022b). Screening the people before vaccination and conducting rapid community assessments will provide insights into public health issues and the community's needs, which could be incorporated into the vaccine program's design (CDC, 2022d). Risk assessment on individuals with pre-existing conditions and allergy history should be done before vaccinations (CDC, 2022d). Evaluating the impact of COVID-19 vaccinations on the targeted population by collecting and analyzing data will assist in measuring expected outcomes (CDC, 2022d). Implementation and guiding policy adjustments can be made to ensure that set goals for the vaccination programs are achieved.

Public Health Practioners (PHP) must advocate for policy changes that favor COVID-19 vaccination intervention programs and create awareness through trusted social platforms to ensure resources are available to help individuals connect, share medical and personal experiences, and access professional guidance on COVID-19 vaccination uptake and other preventive measures. By addressing the specific needs of the vulnerable population and applying evidence-based strategies, public health

professionals can play a vital role in promoting resilience, well-being, and recovery in efforts to curb the emergent COVID-19 disease.

Conclusion

This qualitative study grounded on the HBM and using the Interactive phenomenological Approach was conducted to understand better why some persons in the community are hesitant to accept scientifically proven vaccines that can protect them from becoming very sick or dying from COVID-19 infection (Huang, J. et al., 2020; WHO, 2020). Opinions expressed over the COVID-19 vaccine from study findings show participants' knowledge and attitudes, in addition to trust mitigated against COVID-19 vaccine hesitancy, as such decision on uptake of vaccine remained persistently low among participants consistent with reports shared by Josiah and Kantaris (2021).

The perspectives of the population's hesitancy to accept the COVID-19 vaccination include the variable findings of the diagnosis of the COVID-19 disease and the nature and symptoms of the disease, which were likened to malaria. Research studies show similarities in symptoms between COVID-19 and other conditions, such as malaria and the common cold. What distinguishes COVID-19 from other conditions is its emergent nature with origins traced back to China (Huang, C. et al., 2020; Paules et al., 2020; Michael et al., 2021), the tendency to spread quickly, highly contagious, lethal, and declaration as a global pandemic due to its threat to humanity (Carlos et al., 2020; Zhang et al., 2020).

Statistics between January 01, 2020, and August 16, 2023, according to the WHO situation report (n.d.), in Nigeria, show a high global mortality rate of 266,675 confirmed

cases of COVID-19, including 3155 deaths. As of August 15, 2023, 127,697,675 vaccine doses have been administered in Nigeria (WHO, n.d.). So far, only 50% of the target to vaccinate at least 70% (2022) of the eligible population has been met, according to Adebowale-Tambe (2023). It has become imperative to implement evidence-based measures and social infrastructures that will decrease the upward trend and another SARS-CoV-2 outbreak. Achieving a buy-in in medical outreach programs can be very difficult when there is declining trust in the government and its policies, complexity in information, fake communication heralded by social media, individual lack of knowledge, and gross negative attitude towards COVID-19 vaccines (Anorue et al., 2021).

This anomaly can be eliminated by initiating changes in health policy, identifying and prioritizing areas for intervention, increasing funding to the health sector, increasing surveillance, maintaining compliance with quarantine protocol, and implementing control measures that meet standards (masks, PPEs, distance, Etc.), advocacy, infrastructural development, and resource redistribution (CDC, 2023a). Collaboration and open channels of communication for better understanding between health authorities, public health practitioners, medical practitioners, pharmaceutical companies, non-governmental organizations, researchers, and society will assist with the issue of trust, increase confidence, advocacy, and the successful implementation of vaccine programs at the grassroots levels for a healthier society (CDC, 2022).

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Appendix A: Participants' Invitation Letter

Dear Sir/Madam,

Complements of the season.

My name is Dominique Mbachie. I am a doctoral candidate in the Department of Public Health at Walden University with an Emphasis on Community Health. In fulfilling my study requirements, I am researching the "Knowledge, Attitudes, and Hesitancy to COVID-19 Vaccination-Uptake in Nigeria". To conduct this study, I am looking for 10-16 volunteer participants living in Nigeria to participate in my study's semi-structured interview. These individuals aged 18 to 60 years have previously not received any COVID-19 vaccination.

Would you be interested in volunteering yourself for this interview? If yes, I would like to share with you this study's informed consent form which states your rights as a participant in the study. Kindly note that your participation in the study will remain confidential and any information you give will be used only for this study. The information will not be shared with any other person or third party. The interview will be scheduled at your desired location, day, and time to avoid any unnecessary inconveniences. It is recommended to use a less distracting venue to aid the interview to proceed with no distractions.

The interview will be conducted within 45 minutes. For my timeline, I wish to commence the semi-structured interview proceedings on May 07th and conclude on May 16th, 2023.

Please let me know if you are available and would like to be a participant in this study via my email address: *XXX@waldenu.edu*.

Thank you for your time and looking forward to hearing from you.

Sincerely,

Dominique Mbachie.

Appendix B: Semistructured Interview Guide

I thank you for participating in this semi-structured interview on the "Knowledge, Attitudes, and Hesitance to COVID-19 Vaccination-Uptake in Nigeria." Within the next 45 minutes, I will seek your perceptions by asking you questions about the study phenomenon. You are encouraged to provide your comments exhaustively to the questions. Further, let me know if you have any questions or if you would want me to repeat any questions, at any time during the interview. If you have no questions, we may proceed with the interview.

1. Please, introduce yourself:
    a. How old are you?
    b. What is your highest level of education?
    c. What is your religious denomination?
    d. What is your marital status?
    e. What is your tribe?
    f. What is your state of origin?

Perceived Susceptibility

2. What do you know about COVID-19 disease? Please, mention COVID-19 disease symptoms that you know.
3. What are the misconceptions about COVID-19 disease and other diseases such as malaria?
4. What is your experience when you (if applicable) or someone you know contracted COVID-19 disease?

5. What do you know about the COVID-19 vaccine and the vaccination uptake in Nigeria?
6. Are you aware of any herbs or homemade medications for curing COVID-19 disease? Why do you prefer or would have recommended the use of homemade or herb medication for treating COVID-19 disease?

Cue to Action

7. What impacts do your family, friends, or colleagues have on your decision not to receive the COVID-19 vaccine?
8. What is your religion or denomination's disposition to COVID-19 vaccination uptake?
9. What are your cultural inclinations on COVID-19 disease and COVID-19 vaccine uptake?

Perceived Severity

10. What are the consequences of contracting COVID-19 disease you know? In what way is death a sufficient reason for you to take the COVID-19 vaccine as a preventive measure?

Self-Efficacy

11. How would you describe your personal beliefs about receiving the COVID-19 vaccine now? Tell me what you know or have seen about people who received the COVID-19 vaccine and how it has no negative consequences on their health.
12. Can you share any of your personal beliefs for or against the effectiveness of the COVID-19 vaccine as a cure for COVID-19 disease?

Perceived Barriers

13. What are the barriers constraining you or your willingness to receive the COVID-19 vaccine?
14. What is your religious belief (Christian or Muslim) and position on COVID-19 disease and COVID-19 vaccine uptake?
15. What are the reasons why you or other persons you know or have discussed with, are hesitant to receive the COVID-19 vaccine?
16. Can you describe any health, financial, and other implications or challenges COVID-19 vaccine uptake might pose to you if you receive the COVID-19 vaccine?

Perceived Benefits

17. What are the health, financial, and other benefits you will receive if/when you accept the COVID-19 vaccine?
18. What benefits persuade or deter you from receiving the COVID-19 vaccine?
19. What are your thoughts on the effective control of COVID-19 disease?
20. Can you tell me anything you would like to share with me about your hesitancy to receive the COVID-19 vaccine?

I sincerely appreciate your sharing your experience and thoughts on this study. As stated in the consent form, I will not share advertently or inadvertently the information you have provided for this study. You are entitled to receive a copy of these study findings upon request. I can be reached at XXX@waldenu.edu. Once again, thank you for your participation.