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Perception and Covid-19 Vaccine Hesitancy among Pastoralist in Kebbi State, Nigeria

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A B S T R A C T

This study explores the perception and hesitancy towards Covid-19 vaccination among pastoralist communities in Kebbi State, Nigeria. Despite ongoing national immunization campaigns, vaccine uptake among marginalized groups such as pastoralists remains low, necessitating an in-depth investigation of the underlying factors. A mixed-methods approach was employed, integrating quantitative surveys and qualitative interviews to assess socio-demographic characteristics, awareness, and key drivers of vaccine hesitancy. Data were collected from 400 respondents across two livestock zones selected through stratified random sampling. The findings reveal that 55% of respondent's harbor skepticism towards the vaccine, with 48.5% attributing this to concerns about covert birth control efforts. Additionally, 72% of participants acknowledge preventive measures such as handwashing, indicating awareness but a disconnect in translating knowledge into vaccine acceptance. Gender disparities emerged, with 58.3% of participants being male, underscoring the influence of patriarchal structures in decision-making. The study identifies religious beliefs, misinformation, and distrust of external health initiatives as critical barriers. It recommends community-driven interventions, engagement with religious leaders, and mobile vaccination units tailored to the migratory nature of pastoralists. Addressing these challenges is essential for enhancing vaccine coverage and achieving equitable health outcomes in line with Sustainable Development Goals (SDGs). This research contributes to the broader discourse on vaccine hesitancy, emphasizing the need for culturally sensitive health policies targeting under-immunized populations.

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INTRODUCTION

The novel coronavirus disease 2019 (Covid-19) caused by the Severe Acute Respiratory coronavirus 2, is a viral disease that was first discovered in pneumonia cases in the Wuhan province of China (Zhou et al., 2020; Huang et al., 2020). This virus is highly infectious and has spread to more than 200 countries around the world and has been declared a pandemic by the World Health Organization (Cucinotta & Vanelli, 2020).

In Nigeria, the index case was reported on 27 February 2020, and as of today March 11, 2022, Nigeria has recorded 254,945 confirmed cases of Covid-19 with 3,142 deaths and 249,335 discharged from different isolation centres across the country. Kebbi has recorded a total of 480 laboratory confirmed cases and 16 deaths (NCDC, 2020). In most countries, normal daily life activities including socioeconomic have virtually come to a standstill as a result of the Covid-19 pandemic. Travel by air, sea and land have been severely affected as major airports and land borders were shut especially during the initial stage of the pandemic (Avwioro et al., 2021).

According to reports from Covid-19 Vaccine Tracker, as of 11 March 2022, out of a total population of 211 million Nigerians, only 4% were fully vaccinated and 8.7% have obtained at least one dose (Covid-19 Vaccine Tracker, 11 March 2022). This is a low rate even compared with other countries in Africa, for example in South Africa, the figure is 24%. Chidozie et al., 2021 reported lack of confidence in a novel vaccine and safety doubts as the major underlying factors of unwillingness to accept a potential Covid-19 vaccine in Nigeria.

With the short potency of Covid-19 vaccines, it has become imperative for government to encourage citizens to receive their shot. The AstraZeneca doses would normally be safe to keep for at least six months from the time of manufacture, under suitable conditions. Nigeria received 700,000 doses of the AstraZeneca vaccine from the UK in August, and 800,000 from Canada in September, with a further 500,000 coming from France in October. Around the same time, Nigeria also received four million doses of the Moderna vaccine and 3.6m Pfizer doses from the US. However, its emerged that Nigeria has a large stockpile of out-of-date vaccines which has gone unused. The health ministry says all expired vaccines have been withdrawn and will be destroyed (BBC, 2021).

Vaccination is one of the most successful and cost-effective interventions in public health (Ozawa et al., 2012; Abakar et al., 2018). In 2015 the World Health Organization estimated that 2–3 million deaths from vaccine preventable diseases (VPD) were averted annually due to vaccination. However, vaccination provision and uptake remain low across diverse settings with substantial gradients across population groups (Hosseinpoor et al., 2016; Restrepo-Mendez et al., 2016). The Sustainable Development Goals (SDGs) target reduction of inequities in an interdisciplinary manner with universal policies considering the needs of disadvantaged and marginalized populations (SDG, 2015). Although innovative approaches such as linking human and animal vaccination by utilizing interdisciplinary teams' increases vaccination uptake among mobile pastoralist communities (Belmaker et al., 2006; Kamadjeu

et al., 2015; Ndiaye et al., 2014; Schelling et al., 2007; Abakar et al., 2018), vaccination coverage among these groups is still lower than for rural settled populations. In Nigeria and other parts of West Africa, Nomadic pastoralists and other mobile groups such as migratory workers and refugees live beyond the reach of established health care programs that are designed to serve sedentary populations. As a result, these groups are often under-immunized, and out of the reach of existing disease surveillance activities (Global Immunization Division, 2014).

LITERATURE REVIEW

For a vaccination program to succeed, implementers must first understand and contextualize the perception and hesitancy of the general public regarding Covid-19 vaccine, this study seeks to gather information from pastoralists in Kebbi State. The results obtained will help guide stakeholders on procedures to ensure positive perception and acceptance of Covid-19 vaccine among pastoral communities. This study aims to understand the perception and Covid-19 hesitancy among pastoralist in Kebbi State and proffer recommendation to increase Covid-19 vaccine intake within pastoralist.

Objectives of the Study

The broad objective of this study is to determine the Perception and Covid-19 Hesitancy among Pastoralist in Kebbi State, Nigeria.

The specific objectives of the study are to:

a. Assess the socio-demographic characteristics of sample population;
b. Investigate respondents' awareness about Covid-19;
c. Examine respondents' perception of Covid-19;
d. Identify the respondents' determinants of hesitancy factors of Covid-19;
e. Investigate pastoralist information source about Covid-19.

METHODOLOGY

This study adopts quantitative surveys. This ensures comprehensive data collection on Covid-19 perceptions and hesitancy among Kebbi State pastoralists. The sample size is determined using the Cochran formula (Cochran, 1977):

$$n = Z^2pq / e^2$$

Where:

- n = Sample size
- Z = 1.96 (95% confidence level)
- p = Estimated proportion (50%)
- q = 1 – p
- e = Margin of error (5%)

A total sample size of 400 respondents was calculated. A stratified random sampling method is applied. Kebbi State is divided into four livestock zones. Two zones were randomly selected, followed by the selection of two local government area (LGA) from each zone. Two pastoralist communities from each LGA are purposively selected. Households are randomly sampled to

ensure representativeness across diverse age groups and socio-economic backgrounds. Qualitative data is analyzed using thematic coding (Braun & Clarke, 2006). NVivo software facilitates coding and analysis. Key themes are identified to triangulate with quantitative data, enhancing transparency and validity.

RESULT AND DISCUSSION

Socio-Demographic Characteristics of Respondents

The study surveyed a total of 400 pastoralists in Kebbi State, and their socio-demographic characteristics are summarized in Table 1. This data provides essential context for understanding the perceptions and vaccine hesitancy among the respondents.

Table 1. Socio-Demographic Characteristics of Respondents

Characteristic	Category	Frequency	Percentage (%)
Age	18-30	100	25.0
	31-45	125	31.3
	46-60	85	21.3
	Above 60	90	22.5
Gender	Male	233	58.3
	Female	167	41.7
Marital Status	Married	292	73.0
	Divorced	25	6.3
	Widowed	17	4.2
	Single	83	20.8
Educational Attainment	Arabic Education	42	10.5
	Adult Education	67	16.8
	Primary Education	125	31.3
	Secondary Education	58	14.5
	Post-Secondary Education	8	2.0
	None of the above	100	25.0

Characteristic	Category	Frequency	Percentage (%)
	1-5	125	31.3
	6-10	167	41.8
	11-15	67	16.8
Household Size	Above 15	41	10.3

The socio-demographic analysis of the 400 respondents reflects key characteristics of the pastoralist population in Kebbi State, Nigeria. The largest age group (31.3%) falls between 31-45 years, indicating the critical role of middle-aged adults in decision-making and economic activities, consistent with findings from Abakar et al. (2018). Males constitute 58.3% of the sample, reinforcing male dominance in household leadership and healthcare decisions, as reported by Ndiaye et al. (2014). The marital status distribution highlights a predominantly married population (73.0%), pointing to the influence of family structures on health-seeking behaviour. Educational attainment remains low, with 25% lacking formal education, reflecting barriers to health literacy, a factor strongly correlated with vaccine hesitancy (Restrepo-Mendez et al., 2016). Primary education is the highest level attained by 31.3% of respondents, underscoring limited access to higher education. Household size data reveals that 41.8% of respondents live in households with 6-10 members, aligning with patterns typical of pastoralist communities (Hosseinpoor et al., 2016). These demographic insights highlight the importance of culturally tailored interventions to address vaccine hesitancy and improve health outcomes through targeted education and enhanced access to vaccination services.

Awareness and Knowledge about Covid-19

The respondents' awareness and knowledge about Covid-19 were assessed using a five-point Likert scale, with results presented in Table 2.

Table 2. Awareness of Covid-19 Preventive Measures

S/No	Awareness Statement	SA (%)	A (%)	N (%)	D (%)	SD (%)
1	Cleanse your hands often with soap	39.3	29.5	15.3	10.8	5.3
2	Maintain a safe distance	34.5	25.8	19.8	15.5	4.5
3	Do not touch your eyes, nose or mouth	30.5	29.3	20.3	14.8	5.3
4	Stay home if you feel unwell	25.3	34.0	24.5	10.5	5.8
5	Cover your face with a mask	29.8	30.5	15.8	19.0	5.0
6	Fever, cough, and difficulty breathing	20.8	39.8	24.5	10.0	5.0

S/No	Awareness Statement	SA (%)	A (%)	N (%)	D (%)	SD (%)
7	Follow medical directions of your local authority	24.3	30.8	20.8	15.8	8.5

The results indicate a substantial awareness of Covid-19 preventive measures among respondents, with 39.3% strongly agreeing and 29.5% agreeing to frequent handwashing as a critical prevention strategy. Mask usage also showed significant endorsement, with 29.8% strongly agreeing and 30.5% agreeing. Maintaining physical distance received slightly lower support, with 34.5% strongly agreeing, reflecting potential implementation challenges in communal settings (Bwire et al., 2021). Interestingly, 30.5% strongly agreed on the importance of avoiding face-touching, yet 14.8% disagreed, highlighting persistent gaps in behavioural adherence, consistent with findings in similar socio-economic contexts (Okonjo et al., 2020). Notably, 39.8% agreed that recognizing symptoms like fever and cough is crucial, although 24.5% remained neutral, signalling a need for enhanced symptom awareness campaigns. The results underscore the importance of culturally sensitive, community-driven interventions to bridge knowledge gaps and promote sustained behavioural change (Nwafor et al., 2022).

Perception of Covid-19

The perception of Covid-19 among the pastoralists was also evaluated using a five-point Likert scale, as shown in Table 3.

Table 3. Perception of Covid-19 Vaccination

S/No.	Pastoralist Perception	SA	A	DN	D	SD
1	I believe that covid-19 vaccine is harmful	38.5	34.0	16.3	5.8	5.5
2	I cannot take covid-19 vaccine because I do not trust the source	43.0	30.8	15.3	5.5	5.5
3	Covid-19 vaccines are meant for Africans	33.5	24.8	21.0	15.3	5.5
4	My religion does not allow me to take vaccines	28.3	19.5	26.5	16.0	9.8
5	I believe that covid-19 vaccines are meant for birth control	48.5	21.0	14.8	10.5	5.3
6	I believe that covid-19 vaccine is good for me	24.5	29.8	19.8	15.3	10.8
7	People should be vaccinated against covid-19 to prevent the scourge of the virus	39.3	33.5	16.3	5.5	5.5
8	I believe covid-19 has nothing to do with birth control	20.8	26.3	25.5	18.5	8.9
9	Covid-19 is only preventable through vaccines	29.5	31.0	20.3	12.5	6.8
10	I have not seen anyone that died as a result of taking covid-19 vaccine	34.0	28.5	21.5	10.0	6.0

The results highlight pervasive scepticism and misconceptions surrounding Covid-19 vaccination among pastoralists. A significant proportion (38.5%) strongly believe the vaccine is harmful, with another 34.0% agreeing, indicating entrenched fears about vaccine safety. Mistrust of the vaccine's origin remains high, with 43.0% expressing concern over vaccine sources.

Additionally, 48.5% of respondents are convinced that the vaccine serves as a form of birth control, a belief echoed in several marginalized communities where misinformation thrives (Wilson & Wiysonge, 2021). Religious opposition also plays a critical role, with 28.3% strongly agreeing that their faith prohibits vaccination, consistent with studies identifying religious barriers to immunization uptake (Karaivanov et al., 2022). Although 29.5% of respondents acknowledge that vaccines are crucial for prevention, a notable 18.5% disagree, suggesting the persistence of alternative views on disease prevention.

On a positive note, 34.0% strongly affirm that they have not witnessed deaths linked to the vaccine, challenging fear-based narratives. However, 25.5% remain undecided about the relationship between vaccines and birth control, underscoring the complexity of prevailing beliefs. These findings align with global research, which emphasizes that vaccine hesitancy in rural settings is shaped by a mix of cultural, religious, and socio-economic factors (Betsch et al., 2021; Solís Arce et al., 2021). Addressing these issues necessitates a multi-pronged approach, involving community engagement, targeted public health messaging, and collaboration with religious and traditional leaders to dispel myths and build vaccine confidence (Pugliese-Garcia et al., 2018).

Determinants of Vaccine Hesitancy

Determinants contributing to vaccine hesitancy were evaluated using a five-point Likert scale, as shown in Table 4.

Table 4. Determinants of Vaccine Hesitancy

S/No.	Pastoralist Hesitancy	SA	A	DN	D	SD
1	When injected one may fall sick and die	54.8	24.3	11.0	5.5	4.5
2	Religiously prohibited	39.5	29.8	15.8	10.3	4.8
3	Birth control vaccine in disguise	49.5	26.0	14.3	6.0	4.3
4	Rich man sickness	34.8	24.5	19.8	15.5	5.5
5	Disease caused by mosquito	59.5	19.5	10.8	5.0	5.3
6	There is no Covid-19	64.5	19.8	9.5	3.5	2.8

The results reveal significant vaccine hesitancy among pastoralist communities, driven by a mix of misconceptions and cultural beliefs. The perception that vaccination could lead to illness or death was the most prevalent, with 54.8% of respondents strongly agreeing, a finding consistent with similar studies that highlight fear of adverse effects as a major barrier to vaccine acceptance (Lin et al., 2021). Additionally, 49.5% of respondents believed that Covid-19 vaccines serve as a form of birth control, reflecting widespread misinformation that parallels narratives observed in other African settings (Jegede, 2020). Religious objections were also pronounced, with 39.5% strongly agreeing that vaccination is prohibited by their faith. This aligns with previous findings indicating that religious interpretations can significantly shape health-seeking behaviours (Karaivanov et al., 2022). The belief that Covid-19 is a "rich man's disease" was endorsed by 34.8%, highlighting socio-economic dimensions of vaccine hesitancy often found in marginalized populations (Solis Arce et al., 2021). Alarmingly, 64.5% of respondents strongly

believed that Covid-19 does not exist, indicating entrenched disbelief and distrust in public health messaging.

Addressing these challenges necessitates community-cantered interventions that leverage trusted local voices, such as religious leaders and traditional healers, to correct misinformation and foster vaccine confidence (Pugliese-Garcia et al., 2018). Additionally, health communication strategies must be culturally sensitive, emphasizing the safety and necessity of vaccination through tailored outreach programs (Wilson & Wiysonge, 2021).

CONCLUSIONS AND RECOMMENDATIONS

This study underscores the complex determinants influencing COVID-19 vaccine hesitancy among pastoralist communities, highlighting the interplay of cultural beliefs, misinformation, religious concerns, and economic barriers. The findings reveal that over 55% of respondents believe vaccination may lead to illness or death, with others distrusting vaccine sources or perceiving vaccines as instruments of population control. These insights reflect broader public health challenges, consistent with existing literature that identifies socio-cultural and economic factors as key drivers of vaccine hesitancy in marginalized populations (Ozawa et al., 2012; Kamadjeu et al., 2015). The results emphasize the need to address not only individual attitudes but also structural and systemic barriers that hinder vaccine uptake. This study contributes to the growing body of evidence that calls for inclusive, community-cantered approaches to improve health interventions in underserved populations.

To reduce vaccine hesitancy among pastoralist communities, public health initiatives must adopt culturally sensitive and context-specific strategies. Key recommendations include:

1. Community Engagement and Education-Partner with local leaders, religious figures, and traditional healers to dispel misinformation and promote vaccine safety through trusted channels.
2. Improved Accessibility-Expand mobile vaccination services to reach remote pastoralist settlements, addressing logistical and economic barriers to healthcare access.
3. Localized Health Campaigns-Develop tailored health education programs that address prevalent myths and emphasize the benefits of vaccination, utilizing local languages and culturally resonant messaging.
4. Policy Integration-Embed vaccine awareness initiatives into broader healthcare services and routine immunization programs to ensure sustainability and continuity.
5. Monitoring and Feedback-Establish community feedback mechanisms to continuously assess vaccine perception trends and adapt interventions based on emerging concerns.

FURTHER STUDY

This research still has limitations so further research is still needed on this topic “Perception and Covid-19 Vaccine Hesitancy among Pastoralist in Kebbi State, Nigeria”.

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