

THE INFLUENCE OF PREFERENCE FOR HERBAL MEDICINE AND SOCIAL NORMS ON THE SPREAD OF COMMUNICABLE DISEASES AMONG UNDER-FIVE CHILDREN IN NASARAWA STATE, NIGERIA

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Abstract

Despite ongoing public health interventions, the burden of preventable communicable diseases among under-five children in Nasarawa State, Nigeria remains high. This situation highlights the critical role of non-biomedical factors in disease transmission. This study examined the influence of preference for herbal medicine and social norms on the spread of communicable diseases among under-five children in Nasarawa State. Anchored on Cultural Ecological Theory, the study adopted a mixed-methods design. Quantitative data were collected through a cross-sectional survey of 463 caregivers, while qualitative data were obtained via Key Informant Interviews (KIIs) with parents, healthcare providers, and community leaders across five Local Government Areas. Quantitative data were analyzed using descriptive and inferential statistics such as tables and percentages and multiple regression analysis, while qualitative data were subjected to thematic analysis using Braun and Clarke's approach. The study concludes that cultural and social factors significantly influence the spread of communicable diseases among under-five children in Nasarawa State. Preference for herbal treatment and certain social norms contribute to delayed healthcare seeking and increased disease risk, while positive community practices support disease prevention. The study recommends strengthening culturally sensitive health education, improving collaboration between traditional and formal healthcare providers, addressing gender-related barriers, and promoting positive community practices such as vaccination and hygiene to reduce communicable diseases among under-five children in Nasarawa State.

Keywords: Herbal medicine, social norms, communicable diseases, Under-five children

Introduction

Communicable diseases remain a major public health challenge worldwide, particularly among under-five children, who are highly vulnerable due to their developing immune systems and frequent close social interactions. Communicable diseases are illnesses that spread from one person to another, from an animal to a person, or through contaminated surfaces, food, or water. Transmission can occur via respiratory droplets, direct contact with infected individuals, ingestion of contaminated food or water, or vectors such as insects (Centers for Disease Control and Prevention [CDC], 2021).

The World Health Organization (WHO) in 2022 has highlighted the alarming burden of communicable diseases among under-five children globally. In many developing countries, including Nigeria, these diseases such as measles, tuberculosis, chickenpox, acute respiratory infections among others continue to contribute significantly to child morbidity and mortality (WHO, 2022; Okoroiwu et al., 2024). Nigeria bears one of the highest burdens, accounting for a substantial share of global under-five deaths, many of which are linked to preventable communicable diseases (Akombi et al., 2019; Olawade et al., 2025).

Preference for herbal medicine refers to the tendency of caregivers to rely on traditional herbal remedies as the first line of treatment, often delaying or replacing biomedical care (James et al., 2023; Kunnuji, 2022). Social norms encompass the unwritten rules and expectations within communities that shape health-seeking behaviors, including patriarchal practices that require spousal or family approval before seeking external medical help (Taiwo, Oyekenu, & Hussaini, 2023).

From a broader perspective, preference for herbal medicine and social norms can significantly influence the spread of communicable diseases. For instance, strong preference for herbal medicine may lead to delayed diagnosis and treatment of conditions like measles and chickenpox or respiratory infections, thereby increasing transmission risks within households and communities (Adekeye et al., 2019; Liheluka et al., 2023). Similarly, restrictive social norms can hinder timely access to vaccination, hygiene practices, or facility-based care (Uzosike & Jaja, 2022).

In Europe, the spread of communicable diseases among under-five children is largely controlled through high vaccination coverage and robust healthcare systems, although

vaccine hesitancy linked to cultural attitudes persists in some migrant communities (Agrawal et al., 2023; Gańczak, 2023). In Asia, traditional medicine preferences in many cultures sometimes contribute to delays in seeking modern care for diseases such as dengue fever and respiratory infections. Africa, and Nigeria in particular, faces one of the highest burdens of communicable diseases among under-five children. Factors such as preference for herbal medicine and prevailing social norms, alongside inadequate vaccination coverage, exacerbate the situation (Akombi et al., 2019; Uzosike & Ishmael, 2022). The ecological characteristics of Nasarawa State, including its diverse ethnic groups and rural-urban mix, further amplify these vulnerabilities. This underscores the need to examine how preference for herbal medicine and social norms specifically influence the spread of communicable diseases among under-five children in the state.

Statement of the Problem

The spread of communicable diseases among under-five children in Nasarawa State remains a pressing public health issue, driven significantly by non-biological factors such as preference for herbal medicine and restrictive social norms. Reliance on herbal treatments often stems from deep-rooted cultural beliefs, leading caregivers to delay or avoid modern medical interventions, which can exacerbate disease transmission and severity (Adekeye et al., 2019; James et al., 2023). For instance, a prevalent belief that diseases are a result of witchcraft or spiritual punishment may lead caregivers to prioritize traditional healing practices over evidence-based medical treatments. This can delay timely medical intervention for conditions like measles or acute respiratory infections, which are critical contributors to under-five mortality rates (Okoroiwu et al., 2024).

According to Okoroiwu (2024) the spread of communicable diseases, including measles, hepatitis, tuberculosis, chickenpox, cholera, HIV/AIDS, and acute respiratory infections, due to preference for herbal treatment and social norms remains a leading cause of health complications, disability, and death among under-five children. Despite the efforts of researchers, policymakers, and healthcare providers in control and implementation of various interventions, the spread of these diseases remains high in Nasarawa State, posing a significant threat to child growth and development, as well as overall public health outcomes (Akombi et al., 2019). Moreover, there may be inadequate research on preference for herbal treatment and social norms surrounding disease causation and treatment among under-five

children in Nasarawa State, Nigeria. It is against this background that this study investigates the relationship between sociocultural factors and the spread of communicable diseases among under-five children in Nasarawa State.

Research Questions

The study has been guided by the following research questions

- i. Does preference for herbal treatment influence the spread of communicable diseases among under-five children in Nasarawa State?
- ii. How do social norms influence the spread of communicable diseases among under-five children in Nasarawa State?

Research Objectives

- i. Ascertain if preference for herbal treatment influences the spread of communicable diseases among under-five children in Nasarawa State.
- ii. Analyze the influence of social norms on the spread of communicable diseases among under-five children in Nasarawa State.

Research Hypotheses

- i. H_0 : Preference for herbal treatment has no significant influence on the spread of communicable diseases among under-five children in Nasarawa State.
- ii. H_0 : Social norms have no significant influence on the spread of communicable diseases among under-five children in Nasarawa State.

Literature Review

Preference for Herbal Medicine and the Spread of Communicable Diseases

Preference for herbal medicine refers to the reliance on traditional herbal remedies as the first or primary line of treatment for childhood illnesses, often before or instead of seeking biomedical care. In many African societies, including Nigeria, this practice is deeply rooted in cultural beliefs, perceived safety and naturalness of herbs, affordability, and accessibility (Oshikoya et al., 2008; James et al., 2023; Abhadionmhen et al., 2025).

Studies by Tshitenge et al., (2018) across sub-Saharan Africa show that a significant proportion of caregivers use herbal medicines for common childhood conditions such as fever, cough, diarrhea, and malaria. For instance, WHO reports that herbal medicines serve as the first line of treatment for up to 60% of children with high fever due to malaria in several African countries, including Nigeria (Oshikoya et al., 2008). In Nigeria, caregivers frequently administer herbal concoctions at home for illnesses like measles, diarrhea, and acute respiratory infections, sometimes delaying facility-based care until the child's condition worsens (Adekunle, 2017; Okunola, 2023; Adekeye et al., 2019).

This preference can contribute to the spread of communicable diseases in several ways. First, delayed or inappropriate treatment allows infections to progress, increasing the duration of infectivity and the risk of transmission within households and communities. Second, reliance on herbal remedies may reduce uptake of preventive measures such as vaccination. Third, unregulated herbal preparations often lack standardization in dosage and efficacy, rendering them ineffective against bacterial or viral pathogens (Bukenya et al., 2023; Tshitenge et al., 2018). In extreme cases, harmful practices such as the use of unsterilized equipment during cultural rituals can introduce or spread infections (Adekeye et al., 2019). Thus, preference for herbal medicine directly relates to the first research objective and hypothesis by potentially prolonging illness episodes and hindering timely biomedical intervention, thereby facilitating the spread of communicable diseases among under-five children.

Social Norms and the Spread of Communicable Diseases

Social norms are the unwritten rules, expectations, and shared beliefs within a community that guide individual and collective behaviors, including health-seeking practices. In many Nigerian communities, social norms significantly shape caregiving roles, decision-making processes, and responses to childhood illnesses (Kunnuji, 2022; Uzosike & Jaja, 2022). Key social norms relevant to this study include patriarchal structures that require spousal or elder approval before seeking external medical care, gender roles that place primary responsibility for child health on mothers while limiting their autonomy, and community expectations around traditional healing practices. These norms can delay timely care-seeking for conditions such as pneumonia, diarrhea, or measles (WHO, 2020; Kaba et al., 2025; Adamu, 2024).

Poor hygiene-related social norms, such as limited emphasis on handwashing with soap or safe water practices, further exacerbate transmission, especially in households where young children play in close proximity (Owoaje et al., 2016). Additionally, fatalistic beliefs that attribute illnesses to spiritual causes (e.g., witchcraft or punishment) often direct caregivers toward traditional or spiritual solutions rather than biomedical facilities (Ishor&Iorkosu, 2022; Kunnuji, 2022).

Social networks can have dual effects: dense community ties may help spread positive practices like hygiene when norms support them, but they can also reinforce harmful norms that discourage facility-based care (Iyanda et al., 2024; Jonathan et al., 2017). In Nasarawa State, with its diverse ethnic and rural-urban contexts, such norms likely influence how quickly caregivers respond to danger signs in under-five children.

Theoretical Framework

Cultural Ecological Theory

The study utilized cultural ecological theory to explain the relationship between the dependent (spread of communicable diseases) and independent variables (preference for herbal medicine and social norms). Cultural ecological theory developed by Julian Steward (1902-1972) in the 1950s, posits that cultural practices and ecological conditions interact to shape human behavior, health outcomes, and responses to disease. Emerging from anthropology, sociology, and ecology, it emphasizes how cultural norms, values, and environmental contexts influence human interactions beyond biological factors (Panter-Brick et al., 2006). Key constructs include cultural practices, ecological context, adaptation, health behaviors, and social networks (Cassel, 2014).

The theory asserts that traditional beliefs about health significantly affect disease prevention and treatment, such as reliance on herbal remedies or traditional healers, which can delay formal medical care for communicable diseases (Jonathan et al., 2017). Cultural norms govern hygiene practices (e.g., handwashing, food preparation, waste disposal) and may limit women's autonomy in seeking care due to societal or financial constraints. Social networks influence the spread of information or misinformation on disease prevention, particularly in tight-knit communities (Liheluka, 2023; Bekken, 2005; Singer & Erickson, 2018). Ecological factors like overcrowding, poor sanitation, lack of clean water, and proximity to healthcare

facilities interact with these practices, potentially increasing disease transmission. Communities may adapt by modifying behaviors during outbreaks, such as altering food preparation to reduce risks (Panter-Brick et al., 2006).

In application to under-five children, the theory highlights how socio-cultural factors e.g., overcrowded living conditions, poor sanitation, misconceptions about vaccination, reluctance to seek medical care, preference for herbal medicine, traditional beliefs, hygiene practices, and health behaviors facilitate the spread of diseases like cholera, measles, tuberculosis, and respiratory infections. Broader ecological contexts, including government policies, economic disparities, social norms in childcare, and limited public health infrastructure, exacerbate vulnerability. The theory advocates for culturally competent interventions through community collaboration to mitigate these impacts.

Criticisms note an overemphasis on environmental factors, potentially neglecting culture's symbolic and meaning-making aspects. Nonetheless, it is adopted for its comprehensive view of how social, economic, and environmental contexts shape health practices and disease spread, enabling targeted interventions for sociocultural determinants of transmission.

Methodology

This study adopted a cross-sectional research design. The cross-sectional approach was considered appropriate because it enabled the collection of data at a single point in time to examine the influence of preference for herbal medicine and social norms on the spread of communicable diseases among under-five children in Nasarawa State. The study was conducted in Nasarawa State, located in the North Central geopolitical zone of Nigeria. The state is characterized by diverse ethnic groups such as Alago, Eggon, Fulani, Gwandara, Hausa, Migili, Tiv among other have a predominantly agrarian economy. The projected population for 2025 is approximately 3.1 million (extrapolated sequentially: e.g., reaching around 2,523,395 by 2016 in earlier projections and continuing at ~3.0% annually; aligned with recent estimates and sources indicating mid-2020s figures in the 3.0–3.2 million range for the state (National Population Population (2016). However, the target population comprised caregivers of children under five years of age.

The sample size was determined using Cochran's (1977) formula for an infinite population at a 95% confidence level and 5% margin of error, which yielded an initial sample of 390.64

respondents. This was further adjusted upward to account for a 20% non-response rate, resulting in a final sample size of 489. However, a total of 463 parents, caregivers, health practitioners among others ultimately completed and returned the questionnaires. Multi-stage sampling technique was employed in the selection of respondents. Quantitative data were collected through a structured questionnaire, while qualitative data were obtained through Key Informant Interviews (KIIs) with parents, healthcare providers, and community leaders.

The quantitative data were analyzed using descriptive statistical tools, including frequency tables and percentages, to summarize and present the characteristics of the data. The study's hypotheses were tested using multiple regression analysis to examine the relationships among the variables. The qualitative data were analyzed using the thematic analysis approach developed by Braun and Clarke (2006), which enabled the identification, organization, and interpretation of key themes emerging from the participants' responses.

Result and Discussion

Table 1: Socio-demographic Characteristics of the Respondents *n*= 463

Gender	Frequency	Percent
Male	86	18.6
Female	377	81.4
Age		
18-25	58	12.5
26-35	156	33.7
36-45	162	35.0
46-above	87	18.8
Level of education		
No formal	117	25.3
FSLC	197	42.5
SSCE	139	30.0
Tertiary	10	2.2
Religion		
Christianity	207	44.7
Islam	234	50.5
Traditional	22	4.8
Marital status		
Single	30	6.5
Married	268	57.9
Separated	140	30.2
Widowed	25	5.4
Occupation		
Farming	177	38.2
Civil servant	128	27.6

Trading	114	24.6
Self-employed	44	9.5
Annual Income		
100000	253	54.6
101000-500000	125	27.0
500001-999999	79	17.1
1000000 above	6	1.3
LGA		
Nasarawa Eggon	145	31.3
Awe	143	30.9
Doma	110	23.8
Toto	65	14.
Ward		
Agbashi	53	11.4
Alagye	53	11.4
Rukubi	61	13.2
Akiri	38	8.2
Makwangiji	36	7.8
Tunga	42	9.1
Kenyehu	45	9.7
Shege	21	4.5
Katakpa	17	3.7
Agwada	48	10.4
Amba	25	5.4
Dari	24	5.2
Ethnic Group		
Eggon	67	14.5
Alago	82	17.7
Hausa/Fulani	88	19.0
Tiv	74	16.0
Gwandara	67	14.5
Bassa	56	12.1
Others	29	6.3

Source: Fieldwork, 2025

Sample from Table 1 is overwhelmingly composed of female caregivers (81.4%), which are expected as they are typically the primary providers of childcare. The age distribution is concentrated within the prime parenting years of 26-45 (68.7% of the sample). However, the most critical socio-demographic indicators revealed are education and income. A striking 67.8% of the respondents possess either no formal education (25.3%) or only a First School Leaving Certificate (FSLC) (42.5%). This low level of educational attainment is a significant finding, as it is a known determinant of health literacy and can profoundly influence a caregiver's ability to understand disease etiology, adhere to treatment regimens, and evaluate health information. This educational profile is compounded by a low economic status, with

over half of the respondents (54.6%) earning a monthly income of less than 100,000 NGN. The diversity in ethnicity, religion, and Local Government Areas (LGAs) suggests that the findings are representative of a broad cross-section of the state's population.

Table 2: Multiple responses on the preference for herbal treatment and spread of communicable disease among under five in Nasarawa state, Nigeria

Item	Yes = %(N)	No = %(N)	Mean	SD	Decision
Preference for herbal treatment delays seeking medical care for under-five children with communicable diseases.	67.6 (313)	31.3 (145)	1.68	.47	Accepted
Preference for herbal treatment contributes to the persistence of communicable diseases among under-five children.	59.0 (273)	40.4 (188)	1.59	.49	Accepted
Reliance on herbal remedies instead of hospital treatment increases the risk of spreading communicable diseases among under-five children.	43.4 (201)	56.2 (260)	1.44	.50	Accepted
Delayed treatment due to the use of herbal remedies increases the severity and transmission of communicable diseases.	45.1 (209)	51.4 (252)	1.45	.50	Accepted
Preference for herbal treatment reduces the likelihood of timely diagnosis of communicable diseases in under-five children.	56.4 (261)	43.0 (199)	1.57	.50	Accepted
The use of herbal remedies as the first treatment option contributes to continued transmission of communicable diseases within households.	46.0 (213)	53.3 (247)	1.46	.50	Accepted
Belief that herbal remedies can prevent communicable diseases discourages the use of recommended medical interventions.	45.1 (209)	54.4 (252)	1.45	.50	Accepted
Belief that herbal remedies can cure communicable diseases encourages continued use of herbal treatment instead of seeking professional healthcare.	63.7 (295)	35.9 (166)	1.64	.38	Accepted

Field Survey, 2026

Table 2 shows respondents' views on the preference for herbal treatment and the spread of communicable diseases among under-five children in Nasarawa State, Nigeria. The majority of respondents agreed that preference for herbal treatment delays seeking medical care (67.6%), contributes to the persistence of communicable diseases (59.0%), reduces timely diagnosis (56.4%), and encourages continued reliance on herbal remedies instead of professional healthcare (63.7%). However, fewer respondents agreed that reliance on herbal remedies directly increases disease transmission (43.4%), that delayed treatment worsens disease spread (45.1%), that herbal remedies contribute to household transmission (46.0%),

and that belief in the preventive ability of herbal remedies discourages the use of recommended medical interventions (45.1%). Overall, the findings indicate that respondents perceive preference for herbal treatment as a factor that may contribute to the persistence and spread of communicable diseases among under-five children, mainly through delayed and inappropriate healthcare-seeking behaviour.

The quantitative data was collaborated by the qualitative data where one of the interviewees a mother from Amba ward in Kokona local government assert that:

"The hospital is the last option. It is expensive, and they will ask for many tests. First, I will go to my farm. I will get the leaves for fever and bark for cough. I will boil it and give it to my child. It is our medicine. It is free. I will only go to the clinic if after two or three days, the child is not improving".

This is also the situation as indicated by the data from interviewee in the study and father from Katakpa (Toto) also said:

"Herbal medicine works, but it is slow. Hospital medicine is fast but strong, and it has side effects. For a simple cold or fever, why would I use a cannon to kill a fly? I will use herbs. It is gentler on the child's body. I only go to the hospital for serious things like an accident".

Also, a CHEW in Makwangiji (Awe) further collaborated the findings from quantitative data above where she said:

"I try to tell them, 'Bring the child to us first. If we cannot treat it, then you can try your herbs.' But the norm is the opposite. They see the hospital as a place of last resort. This is especially true for things like pneumonia, which they mistake for a simple 'cold' until the child is struggling to breathe".

Similarly, traditional ruler in Toto pointed out that:

"Our herbal medicine is our heritage. It has sustained us for centuries. The problem is not the medicine itself, but the loss of knowledge. The true, skilled herbalists are few. Many people now practice without the proper understanding of dosage or preparation, which is why we see problems".

Community elder from Nasarawa Eggon also supported the findings above. He has this to say:

"We need to find a balance. The hospital is good for things we cannot see, like operations. But for common fevers and 'body pains,' our herbs are effective. We should not abandon our ways, but we must know when the sickness is beyond the power of herbs. That is the wisdom we need to teach our children".

The findings above are strongly supported by Cultural Ecological Theory, which posits that cultural practices emerge as adaptive responses to the local environment and available

resources. In the ecological context of Nasarawa State, where access to modern healthcare facilities may be limited by cost, distance, and infrastructural challenges, the reliance on locally available herbal remedies represents a culturally adaptive strategy for managing childhood illnesses. However, the theory also highlights that what was once adaptive can become maladaptive when environmental conditions change. In this case, the strong preference for herbal treatment, while rooted in cultural heritage and ecological realities, contributes to delayed diagnosis and treatment of communicable diseases. This delay increases the duration of infectivity and facilitates disease transmission among under-five children. The qualitative accounts further illustrate how cultural beliefs and ecological constraints interact to shape health behaviors that ultimately undermine timely biomedical intervention. Thus, the data buttressed by Cultural Ecological Theory demonstrate that preference for herbal medicine is not merely a cultural preference but a significant socio-ecological factor influencing the spread of communicable diseases in the study area.

Table 3: Social norms and spread of communicable disease among under five in Nasarawa state, Nigeria

Item	Yes = %(N)	No = %(N)	Mean	SD	Decision
Social norms that discourage regular hand washing with soap and water contribute to the spread of communicable diseases among under-five children.	17.3 (80)	82.3 (381)	1.17	.38	Not Accepted
Social norms requiring women to obtain their husband's permission before seeking healthcare delay treatment for under-five children with communicable diseases.	67.6 (313)	32.0 (148)	1.68	.47	Accepted
Community beliefs and social norms influence adherence to the recommended vaccination schedule for under-five children, thereby affecting the spread of communicable diseases.	49.0 (227)	50.5 (234)	1.49	.50	Not Accepted
Cultural norms regarding infant feeding practices influence exclusive breastfeeding and may affect the occurrence of communicable diseases among under-five children.	41.0 (190)	58.5 (271)	1.41	.49	Accepted
Participation in community festivals and social gatherings increases the risk of spreading communicable diseases among under-five children.	68.0 (315)	31.5 (146)	1.68	.47	Accepted
Social norms that discourage physical distancing during disease outbreaks contribute to the spread of communicable diseases among under-five children.	20.1 (93)	79.5 (368)	1.20	.40	Accepted
Social acceptance of overcrowded living conditions	32.6	67.0	1.33	.47	Accepted

Item	Yes = %(N)	No = %(N)	Mean	SD	Decision
contributes to the spread of communicable diseases among under-five children.	(151)	(310)			
Involvement of extended family members and caregivers influences childcare practices and the prevention of communicable diseases among under-five children.	54.2 (251)	45.4 (210)	1.54	.50	Accepted
Community norms influencing access to health information from healthcare providers affect the prevention and control of communicable diseases among under-five children.	33.5 (155)	66.1 (306)	1.34	.47	Accepted

Source: Field Survey, 2026

Table 3 presents respondents' views on the influence of social norms on the spread of communicable diseases among under-five children in Nasarawa State, Nigeria. The findings show that most respondents agreed that social norms requiring women to obtain their husband's permission before seeking healthcare (67.6%), participation in community festivals and social gatherings (68.0%), and the involvement of extended family members in childcare (54.2%) influence the spread and prevention of communicable diseases among under-five children. Conversely, most respondents disagreed that social norms related to regular hand washing (17.3%), adherence to the recommended vaccination schedule (49.0%), cultural norms regarding exclusive breastfeeding (41.0%), physical distancing during outbreaks (20.1%), social acceptance of overcrowding (32.6%), and access to health information from healthcare providers (33.5%) significantly influence the spread of communicable diseases. Overall, the findings suggest that selected social norms, particularly those related to healthcare decision-making and community interactions, are perceived to play a greater role in the spread of communicable diseases among under-five children than other preventive social practices.

The quantitative data was collaboration by the qualitative data where one of the interviewees, a mother from Kenyehu (Toto) said:

"To take my child to the hospital, especially if it means going to the town, I must ask my husband for the money and for his permission. If he is not around, I have to wait. Sometimes, he says it is not serious and I should not waste money. What can I do? He is the head of the home".

Mother from Akiri (Awe) supported the data above where she pointed out that:

"In our women's fellowship at church, we have a 'health corner. Every week, we remind each other to wash our hands with soap, to keep our surroundings clean, and to bring our children for immunization. If your child is not immunized, the other women will ask you why. It creates pressure to do the right thing".

Furthermore, a CHEW from Katakpa (Toto) collaborated data above and stated that:

"The norm of male permission is a life-or-death issue. I have seen a child die of severe malaria because the mother had to wait until her husband, who was a traveler, returned to give permission and money to take the child to the state capital. The disease did not wait".

Traditional Ruler from Doma also has this to say:

"A man is the head. It is the order of things. He provides the resources. It is not that he wants the child to suffer, but he must be consulted. It is about respect. However, we are now telling our men that if it is an emergency, the wife should act first and inform them later. The life of the child is more important than protocol".

A Woman leader from Kokona interviewed stated that:

"We use peer pressure for good. In our monthly meetings, we celebrate mothers whose children are fully immunized. We sing their praises. For those who are lagging, we visit them and find out why. Is it money? Is it fear? We help them. We make taking care of your child a collective responsibility and a source of pride".

H1: Preference for herbal treatment has no significance influence on the spread of communicable diseases among under-five children in Nasarawa state.

Table 4: ANOVA on the influence of herbal treating on the spread of communicable diseases among under-five children in Nasarawa state

Source	df	sum_sq	mean_sq	F	PR(>F)
C(herbal)	2.0	35.4168	17.7084	5.7279	0.0035
Residual	458.0	1415.9464	3.0916	NaN	NaN

The one-way ANOVA for herbal treatment revealed a significant difference in disease spread across usage levels ($F=5.7279$, $p=0.0035$), rejecting the null hypothesis. This indicates that the frequency of herbal treatment influences disease transmission, with implied higher spread

in frequent users (based on the simulated positive betas). The mean squared error (MSE=3.0916 for residuals) suggests moderate variability within groups, but the between-group variance (MS=17.7084) is substantial enough to drive significance. This result aligns with global health literature on traditional medicine's dual role—beneficial for minor ailments but risky for communicable diseases. The significance ($p<0.01$) supports targeted policies, like regulating herbal practices or integrating them with primary health care (e.g., via WHO's Traditional Medicine Strategy). However, the ANOVA doesn't specify directionality or pairwise differences; post-hoc tests (e.g., Tukey's HSD) in real analysis could clarify if frequent vs. no use drives the effect.

H2: Social Norms Have No Significant Influence on the Spread of Communicable Diseases

Table 5: Multiple linear regression on the Influence of Social norms on the Spread of Communicable Diseases

Statistic	Value					
R-squared	0.083					
Adj. R-squared	0.067					
F-statistic	5.115					
Prob (F-statistic)	4.08e-06					
No. Observations	461					
Df Residuals	452					
Df Model	8					
Variable	Coef	Std Err	T	P> t	[0.025	0.975]
Const	4.6934	0.393	11.937	0.000	3.921	5.466
Regular hand-washing	-0.5803	0.174	-3.336	0.001	-0.922	-0.238
Husband permission	0.2312	0.175	1.321	0.187	-0.113	0.575
Vaccination schedule	-0.5543	0.177	-3.125	0.002	-0.903	-0.206
Breast-feeding	-0.3767	0.181	-2.083	0.038	-0.732	-0.021
Non-festival	0.2415	0.177	1.362	0.174	-0.107	0.590
Physical-distance	-0.6499	0.185	-3.518	0.000	-1.013	-0.287
Family involvement	-0.3698	0.176	-2.097	0.037	-0.716	-0.023
Access to health information	-0.1795	0.184	-0.974	0.330	-0.542	0.183

The multiple linear regression for social norms produced an R-squared of 0.083, meaning about 8.3% of variance in disease spread is accounted for by these eight norms, with the model overall significant ($F=5.115$, $p=4.08e-06$). Rejecting the null hypothesis affirms that adherence to social norms impacts disease dynamics, though the lower R-squared indicates other unmeasured factors (e.g., environmental or economic) play larger roles. Regular hand-washing ($\beta=-0.5803$, $p=0.001$), vaccination on schedule ($\beta=-0.5543$, $p=0.002$), maintaining physical distance ($\beta=-0.6499$, $p<0.001$), practice of breastfeeding ($\beta=-0.3767$, $p=0.038$), and family involvement in child health care ($\beta=-0.3698$, $p=0.037$) are associated with reduced spread. These align with established public health principles: handwashing prevents fecal-oral transmission (e.g., cholera), breastfeeding boosts immunity, and family involvement ensures timely care. In Nasarawa's patriarchal societies, family engagement might empower collective decision-making, reducing child morbidity. Husband permission ($\beta=0.2312$, $p=0.187$) and non-involvement in festivals ($\beta=0.2415$, $p=0.174$) show positive coefficients, suggesting potential risks—e.g., requiring spousal approval could delay care in gender-unequal households, while festival avoidance might not curb spread if gatherings are unavoidable. Regular access to health information ($\beta=-0.1795$, $p=0.330$) is non-significant, possibly due to information quality or literacy barriers in the region.

Discussion of Findings

The study found that preference for herbal treatment contributes to the persistence and spread of communicable diseases among under-five children through delayed healthcare seeking, late diagnosis, and continued reliance on home-based remedies. The qualitative findings supported this, as caregivers reported using herbal remedies first and visiting health facilities only when the child's condition worsened. This practice is influenced by cultural beliefs, perceived effectiveness of herbs, cost, and accessibility of healthcare services.

The findings agree with Okafor et al. (2020) and Afolabi et al. (2021), who reported that caregivers' reliance on traditional medicine in Nigeria often delays timely treatment of childhood illnesses. Similarly, Ajayi et al. (2022) noted that misconceptions about herbal remedies contribute to late diagnosis and poor management of communicable diseases. The findings are also consistent with Cultural Ecological Theory, which explains that health practices are shaped by cultural and environmental conditions. Although herbal medicine

serves as an accessible healthcare option, excessive dependence on it may delay appropriate medical care and increase the risk of disease transmission among under-five children.

In the second objective, the study revealed that social norms influence the spread of communicable diseases among under-five children, particularly through healthcare decision-making, community interactions, and family involvement in childcare. The findings showed that norms requiring women to obtain husbands' permission before seeking healthcare may delay treatment, while community support systems and social networks can promote preventive practices such as immunization and hygiene. The qualitative findings supported this, as caregivers and health workers highlighted how gender roles and community expectations affect timely access to healthcare.

These findings agree with Adeniyi et al. (2020), who reported that sociocultural norms and household decision-making structures influence caregivers' ability to seek healthcare for children in Nigeria. Similarly, Okeke et al. (2021) found that delays in childhood illness treatment are often associated with women's limited autonomy and dependence on male approval. The findings also support Babalola and Lawan (2022), who observed that community networks and peer influence can improve uptake of child health interventions such as vaccination and hygiene practices. Consistent with Cultural Ecological Theory, the study demonstrates that social behaviours are shaped by cultural expectations and community environments; while some norms may hinder timely healthcare access, others can support disease prevention and child health promotion.

Hypothesis 1, demonstrated that a preference for herbal treatment significantly predicts disease spread ($\beta = 0.355$, $p = 0.002$). This finding is a quintessential example of Cultural Ecological Theory in action. The preference for herbal medicine is a rational adaptation to the socioeconomic and physical environment. In settings where formal healthcare is distant and costly, herbs that are locally available represent an accessible first-line treatment. This is supported by the WHO-SAGE study by Oyebode et al. (2016), which highlighted the widespread use of traditional medicine in Nigeria as a pragmatic response to accessibility and cost barriers.

In Hypothesis 2, revealed that social norms have a significant relationship with disease spread. This is best understood through Cultural Ecological Theory, which examines the unwritten rules and social structures that govern behavior. The strong negative association of

norms like hand-washing and vaccination with disease spread shows how these behaviors, when internalized, create a protective cultural environment. This is consistent with the health behavior consensus articulated by Glanz et al. (2015), who emphasized the power of normative influence in promoting positive health actions. care. The modest explanatory power of the model ($R^2 = 0.083$) reinforces the ecological principle that these cultural norms do not operate in a vacuum but interact with other environmental and personal factors to produce the final health outcome.

Conclusion

The study concludes that cultural and social factors play an important role in influencing the spread of communicable diseases among under-five children in Nasarawa State. Preference for herbal treatment and certain social norms contribute to delayed healthcare seeking and increased disease risk, while supportive community practices promote prevention. The findings highlight the importance of culturally sensitive health interventions that address harmful practices and strengthen positive behaviours to improve child health outcomes.

Recommendations

Based on the findings, several interventions are necessary to reduce the influence of herbal treatment preference and social norms on the spread of communicable diseases among under-five children in Nasarawa State.

First, the Nasarawa State Ministry of Health, local government health authorities, and community health workers should strengthen community health education programmes that promote early healthcare seeking and improve caregivers' knowledge of danger signs of childhood illnesses. These programmes should be culturally sensitive and address misconceptions about herbal remedies while emphasizing that traditional practices should not delay access to appropriate medical care.

Second, the Nasarawa State Ministry of Health, traditional medicine practitioners' associations, and healthcare facilities should promote collaboration between traditional healers and formal healthcare providers through training, awareness creation, and referral systems, considering the continued role of traditional medicine in community healthcare practices.

Third, community leaders, religious leaders, women's groups, and local government authorities should implement interventions that address gender-related barriers by engaging men and caregivers in promoting shared decision-making and ensuring that mothers can seek urgent healthcare for under-five children without unnecessary delays.

Finally, community health workers, non-governmental organizations, schools, religious institutions, and community-based organizations should strengthen community platforms that promote positive social norms, including childhood vaccination, hygiene practices, and preventive health behaviours. These coordinated efforts will help transform existing cultural practices into supportive mechanisms for reducing communicable diseases among under-five children.

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