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Research Article

Cultural Beliefs and Infant Mortality in Nigeria

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Rationale. Nearly half of all deaths prior to the age of five years globally occur in five nations: China, Democratic Republic of the Congo, India, Nigeria, and Pakistan, with almost a third of these deaths in India and Nigeria (Lawson et al., 2014). *Methods*. This study investigated the cultural beliefs about infant mortality among working mothers in Nigeria. A multistage sampling technique was used to sample ($N = 2400$) working mothers on their cultural beliefs in relation to infant mortality. The present study uses an indigenous questionnaire, "Cultural Beliefs of Infant Mortality Questionnaire (CBIMQ)." A series of hierarchical regressions and analysis of covariance (ANCOVA) were employed to test the hypotheses that cultural beliefs about infant mortality would vary by geography, ethnicity, age, income, education, and marital status. *Results*. Findings revealed that age, education, and mothers' monthly income significantly predicted working mothers' cultural beliefs of infant mortality. Furthermore, results showed differences in marital status, urban vs. rural locality, ethnicity, and religious affiliation on working mothers' cultural beliefs of infant mortality. *Conclusion*. We discuss the implications to address health issues and provide recommendations for targeted programs such as seminars and workshops to be organized by counselors on the scientific causes of infant mortality.

1. Introduction

Research has shown that infant mortality is a major problem in Nigeria and has been linked to factors such as inadequate health facilities, lack of financial capacity, and lack of access to appropriate medical care. The major scientific causes of infant mortality in Nigeria include dehydration, infection, congenital malfunction, pneumonia, measles, diarrhea, and malaria [1]. Efforts to address the high infant mortality rates in Nigeria and in other developing countries date back to the World Summit for Children (WSC) as part of the United Nations in 1990 that brought the welfare of children to the forefront of the global agenda and a promise to improve the lives of children in every part of the world. It was further supported by the National Child Welfare Committee (NCWC) of Nigeria which adopted specific actions to improve child survival in Nigeria. Actions included combating childhood diseases through low-cost remedies and strengthening the Basic Health Services Scheme (BHSS), prioritizing the prevention and treatment of AIDS, providing universal access to safe drinking water and sanitary excreta disposal, and controlling for waterborne diseases [2]. Yet, despite these actions, Nigeria continues to be plagued by high infant mortality rates, with many infant deaths that seemingly could have been prevented through timely and adequate medical care.

More recently, some researchers [3–5] have pointed out the role of cultural beliefs in infant mortality where the endorsement of certain cultural beliefs may be related to the prevention of appropriate care for sick children and lead to infant mortality. Cultural beliefs are commonly held norms and moral standards of a society [6]. Most of these cultural beliefs in Nigeria have existed long before the colonial days and advent of orthodox medicine and include angry gods and evil spirits being the major causes of illness. As such, the presence of an illness may be seen as a warning sign of an imbalance between the natural and the spiritual world [7]. In the present study, we systematically explore cultural beliefs about infant mortality and how they may vary by geography, ethnicity, age, income, education, and marital status to better understand how these cultural beliefs are held by individuals.

1.1. Infant Mortality. Although infant mortality rates for children dying before the age of five years have decreased since 1990 from 93 deaths per 1,000 to 41 deaths per 1,000 in 2016, infant mortality continues to plague developing nations, especially in Africa and Central and South Asia [8]. Nearly half of all deaths prior to the age of five years globally occur in six nations: China, Democratic Republic of the Congo, Ethiopia, India, Nigeria, and Pakistan, with almost a third of these deaths in India and Nigeria [9]. Among developing nations, the infant mortality rate is the highest in sub-Saharan Africa where it is roughly five times higher than developed nations such as those in the European region [8].

In Nigeria, the rate of infant mortality has not only been high compared to other developing nations [10, 11] but also failed to improve relative to other nations since the 1990s when the Millennium Development Goals (MDGs) were first implemented by the United Nations Children's International Emergency Fund (UNICEF) to reduce child mortality rates by the year 2015 [12, 13]. As both the number of births and infant deaths have continued to increase over this time, Nigeria moved to second from fourth [9]. This high rate of childhood death in Nigeria is alarming despite the government and international agencies' efforts at reducing this problem. As such, health care professionals have made clear that urgent and practical measures have to be taken to reverse these rates and trends [11].

1.2. Causes of Infant Mortality. In investigating infant mortality rates globally, researchers have pointed up a number of causes, including preterm birth and intrapartum-related complications, as well as infections such as pneumonia, diarrhea, and malaria [9]. Similarly, in Nigeria, children die from preventable diseases such as cholera, malaria, tetanus, whooping cough, measles, and polio. The Hausa women in the northern part of Nigeria, for example, are no strangers to sickness with regular outbreaks of cholera, meningitis, and malaria in their children. Related to this, some researchers have argued that the lack of institutional care at birth may be related to higher infant mortality rates [14]. In addition, some researchers have pointed out the regional differences in infant mortality rates. Studies have shown differences in infant mortality rates for mothers in North-West and North-East regions relative to South-West and North Central parts of Nigeria [14], pointing to the higher proportion of mothers with less education in the northern regions. Indeed, some [15] have shown differences in infant mortality rates by parental education, income status, and place of residence (access to tap water and private sewage toilet). Other researchers have pointed out [11, 16] that cultural practices such as weaning, infant feeding, refusal of routine polio immunization, and late referral of sick children to the hospital may be related to high infant mortality rates in Nigeria.

1.3. Cultural Practices. In Nigeria, there are certain practices that may be related to greater health risks for infants. As an example, one harmful practice involves the traditional surgical cut performed on the umbilical cord of an infant by traditional birth attendants who are preferred due to their easy availability, intimate relations, and low fees. Not being aware of the concept of using sterile instruments, birth attendants may use different types of instruments such as blades, knives, or bamboo edges to cut the umbilical cord of the newborn. After cutting the umbilical cord, they use different applications on the navel of the newborn, including cow dung, talc powder, cow urine (*ito malu*), and cow bile (*oronro malu*) to clean the umbilical cord [4], but which can lead to infant death [12]. Other examples of cultural practices include mothers resorting to native medicine rather than accessing proper medical attention when children have problems related to convulsions or dysentery.

Furthermore, in Nigeria, if the cause of an illness is not properly diagnosed, people tend to turn to traditional spiritual healers to help them identify the cause of the illness [17]. In these cases, the cause is always supernatural, and usually a member of the extended family will be accused of causing the illness [18]. Oftentimes, these traditional spiritual healers adduce the cause of the illness to the operation of witches that need to be appeased or placated through processes such as rituals, sacrifices, and other traditional form of worship. In most cases, the traditional healers are the medium for such appeasement to stop the innocent child from being harmed. If a child is thought to have been bewitched, herbalists are consulted to cure the victim by propitiation. One illustration involves a folklore explanation by [7], in Yoruba: "Aje ke lana, omokuloni, tani ko mope aje ana lopa omoonije" [the witch cried yesterday, the child died today]; the interpretation of that means a child's death is often attributed to the operations of witchcraft who then would doubt that the witch that cried yesterday is responsible for the death of the child. While witches draw their powers from the cosmic realm, sorcerers get their own power by invoking spirits. Reference [19] believes that witchcraft is still a dreaded word in Nigeria and that it is not uncommon for people to believe that there is nothing like a natural death.

Other examples of cultural practices include the Hausas from the northern parts of Nigeria who believe in the existence of Allah (God) as a highly regarded supreme being who judges by rewarding and punishing each person related to that person's deeds [1, 20]. According to [21–24], most Northerners believe in destiny, whether good or bad, as preordained by Allah. Central to this belief is the use of herbal remedies for physical aspects, magical ritual for reversing what is beyond normal and sacrifices to appease the supernatural agencies. The Northerners also attribute natural illness to be intensified by the activities of enemies, spirits or demons. Reference [19] reported that for the prevention of evil, some substances such as cowries, scents, features, animal skin, and alum are burnt, which they put on the skin of a sick child to prevent death. Yet, despite the common beliefs related to cultural practices and illness, it is not clear based on extant literature the specific cultural beliefs that may be related to infant mortality and, moreover, how these cultural beliefs may vary by age, education, and income as well as marital status, religious and ethnic group affiliation, and locality.

Several researchers have examined attribution and belief systems about infant mortality in Nigeria and have pointed out the cultural beliefs and attribution of maternal mortality in Ejigbo Local Government Area in Osun State, Nigeria [25], and incidence rates and causes of infant mortality as perceived by married women in Ilorin metropolis [10]. These findings suggest that mothers rely on cultural beliefs related to spirits, witchcraft, and the will of God to either engage in specific cultural practices that can increase the risk of their children from becoming ill or explain their infants' poor conditions rather than seeking immediate medical assistance to treat them.

1.4. Cultural Beliefs about Infant Mortality in Nigeria. Nigeria is a multiethnic and multicultural nation comprised of 36 states and a Federal Capital Territory (FCT). It is grouped into six geopolitical regions: North Central, North-East, North-West, South-East, South-South, and South-West. To date, there are about 374 identifiable ethnic groups, with the Igbo, Hausa, and Yoruba constituting the major ethnic groups in Nigeria (National Population Census, 2004) [2]. Interestingly, these social groups vary by their distinct cultural traits, including their cultural beliefs and behaviors. Most of these cultural beliefs have existed long before the colonial days and advent of orthodox medicine and include the belief that angry gods and evil spirits are the major causes of illness and, as such, the presence of an illness may be seen as a warning sign of an imbalance between the natural and the spiritual world [26]. Among ethnic groups in Nigeria, there is the belief that no matter how hardworking individuals are, there are forces that can block their progress [27]. Some professionals have attributed infant mortality rates to traditional beliefs and practices that mothers may adhere to in the Nigerian society where people believe something or someone is behind evil occurrences and the culprits of infant death [11, 17].

2. The Present Study

Although the literature on infant mortality in Nigeria suggests the role of cultural beliefs in infant mortality, there has been little research in examining the specific beliefs that may be associated with infant mortality. The aim of the present study was to investigate specific cultural beliefs of infant mortality among working mothers in Nigeria. Thus, the main research questions being investigated in this study are as follows: What are cultural beliefs that may be related to infant mortality as perceived by working mothers? How do these cultural beliefs related to infant mortality vary by age, education, and income? And could the degree to which mothers subscribe to cultural beliefs vary by locality, ethnicity, their religious affiliation, or their marital status? We expected to find that older people who are highly educated and have more income would be less likely to endorse traditional cultural beliefs. We furthermore anticipated that people living in rural areas, those from more traditional ethnic groups, married mothers, and those from African religious groups would be more likely to support traditional cultural beliefs related to infant mortality.

3. Method

3.1. Participants. This study included a sample of 2400 working mothers in Nigeria who responded to a set of questionnaires. A multistage sampling procedure used in selecting the study sample yielded a total of 2400 working mothers selected across the country. Respondents were recruited from six geopolitical zones in Nigeria in order to ensure a representative national sample of mothers across the country. Geopolitical zones are political divisions in Nigeria separated into six zones and each of these zones comprises six states.

At stage one, a simple random sampling technique without replacement was used in selecting a state from each of the geopolitical zones. This was achieved by using the "deep-hat" method [28] whereby the name of each state in a particular geopolitical zone was written on a strip of paper, folded, and then placed in an opaque container. Thereafter, a "state" was picked randomly from the container and was not replaced. This process was repeated for the remaining geopolitical zones. Thus, one state was selected from each of the zones, making a total of six (6) states. At the end of this process, the states selected were North-West (Kano), North-East (Bauchi), South-West (Ibadan), South-South (Cross River), South-East (Imo), and North Central (Kwara).

In the second stage, purposive sampling technique procedure was used to select both urban and rural samples because of their relevance to the investigation under consideration [29]. Thus, an urban area (the state capital) and a rural area in each state were selected. This two-stage selection process ensured a fair representation of working mothers in rural and urban areas. Overall, 2400 participants represented six geographical areas, with working mothers sampled from each selected urban and rural areas (Table 1).

The participants were all working mothers in Nigeria. There were three major inclusion criteria: (a) participants must be 18 years of age, (b) they must have given birth to at least one child, and (c) they must be working and economically active in formal and informal (e.g., street vendors) economies. The sample included 43% who were single mothers, 52% were married, 2.5% were divorced, and 1.9% were widows. Nearly 25% were between the ages of 18 and 24 years, 39% between 25 and 32 years of age, and 25% between 33 and 39 years of age. Also, 62% of the sample were identified as Christians, 35% identified with the Islamic religion, and 3% reported to practice an African traditional religion. A large proportion of respondents reported to have "basic" tertiary educational attainment, with 19% earning a high school diploma, 22.8% receiving Ordinary National/Higher National Certificate (OND/HND), and 46.5% obtaining a university degree (BA/BS). Furthermore, advanced degree holders with a Master's degree or Ph.D. comprised 7.5% and 2.5% of the respondents, respectively.

3.2. Procedure. Participants were administered a set of questionnaires, with 33% responding by completing them immediately and 67% requesting that they be left with them and collected within 2 weeks. Out of the 2,800 questionnaires distributed, 2,550 were returned, with a response rate of 91%. Of these, 90 of them had to be discarded because they were unreadable and 60 did not meet our minimum criteria of 80% completion of items from the set of questionnaires. As such, 2400 questionnaires were used in the final analysis.

Through the help of the officials in the ministries and the village heads in the various communities, trained research assistants explained the purpose of this study to participants and obtained verbal informed consent from those who agreed to participate in the study. Working mothers are women who rear children and are economically active. Working mothers were randomly sampled from various meeting points in the selected urban and rural areas; such meeting points include cooperative societies, as well as women's associations and office complexes. We administered the questionnaires directly to the respondents at places of meetings. In selecting working women, we made use of staff lists provided by heads of ministries and institutions.

3.3. Instruments

3.3.1. Cultural Beliefs of Infant Mortality Questionnaire (CBIMQ). The "Cultural Beliefs of Infant Mortality Questionnaire," developed by the authors, consists of 20 items using a four-point Likert scale (strongly disagree—1 to strongly agree—4). Using the stem "To what extent do you think the following are the causes of infant mortality?", sample items include "Refusal of mothers to carry out some rituals after child's birth" and "Attacks of ancestral spirits." In the absence of culturally relevant questionnaires in the existing literature on infant mortality for the Nigerian setting, we developed a questionnaire using indigenous items by consulting with experts in the field and then piloting this questionnaire with a large sample. First, we piloted the items in the form of a questionnaire by having experts in the field review and provide suggestions given the Nigerian culture and population. Based on these suggestions by experts, a working version was completed and judged to be suitable for this study. Next, we piloted this questionnaire with a large sample in order to ensure that the items were appropriate for our population and to ascertain the reliability of the measure. For the latter, a test-retest method was adopted and given to 100 respondents. The test was administered on the same group of respondents at an interval of four weeks, with the test-retest correlation at an acceptable 0.79. The instrument was therefore considered reasonably reliable and suitable for the purpose for which it was designed.

3.3.2. Demographics Form. This study also included a set of questions that captured demographic information including participants' age, religion, ethnicity, region, education, income, and marital status.

Table 1: Demographic characteristics of sample ($N = 2400$).

Variable	Frequency (%)
Locality	
Rural	1284 (53.5%)
Urban	1116 (46.5%)
Region	Urban/rural/total
Bauchi	235/165/400 (16.7%)
Cross river	108/292/400 (16.7%)
Ibadan	274/126/400 (16.7%)
Imo	274/126/400 (16.7%)
Kano	29/371/400 (16.7%)
Kwara	196/204/400 (16.7%)
Age	
18–24 years	596 (24.83%)
25–32 years	926 (38.58%)
33–39 years	594 (24.75%)
40 years and above	284 (11.83%)
Religion	
ATR	73 (3.04%)
Christianity	1488 (62%)
Islam	839 (34.96%)
Marital status	
Single	1041 (43.38%)
Married	1253 (52.21%)
Divorced/separated	60 (2.5%)
Widowed	46 (1.92%)
Education	
SSCE	455 (18.96%)
OND/HND	546 (22.75%)
B.A./B.S.	1117 (46.54%)
Master's degree	181 (7.54%)
Ph.D.	59 (2.46%)
Others	42 (1.75%)
Ethic group	
Hausa/Fulani	634 (26.42%)
Igbo	1240 (51.67%)
Yoruba	433 (18.04%)
Others	93 (3.88%)
Income	
Less than 15,000 ($75/month)	561 (23.38%)
16,000–35,000 ($76–$155/month)	1285 (53.54%)
36,000–49,000 ($156–$208/month)	417 (17.38%)
50,000 and above ($250 and above)	137 (5.71%)

3.3.3. Ethical Consideration. Permission was obtained from the various ministries and the village heads before contacting the respondents. The women who were willing to participate in the research were served with the questionnaire.

4. Results

Using the Cultural Beliefs of Infant Mortality Questionnaire (CBIMQ) described above, we conducted a factor analysis using principal axis factoring with varimax rotation on the 20 items associated with this measure. All 20 items were entered into a factor analysis which yielded two factors.

4.1. What Are Cultural Beliefs that May Be Related to Infant Mortality as Perceived by Working Mothers? Table 2 presents the factor loadings of CBIMQ items on each factor. The first factor was interpreted as rituals related to cultural beliefs of

Table 2: Factor loadings and mean scores on cultural beliefs of infant mortality questionnaire items ($N = 2400$).

Cultural belief	Ritual factor	Spirits factor	Mean score
Mother walking at night during pregnancy	0.77		2.23
Wickedness of the birth attendant	0.72		2.38
Mothers of twins refusing to dance in the market place after child's birth	0.63		1.98
Mothers breaking the taboo that forbids eating of salt after child's birth	0.60		1.98
Refusal of mothers to carry out some rituals after child's birth	0.57		2.04
Mothers walking in the hot afternoon without tying a stone	0.56		2.04
Infant spitting or urinating in the fire	0.55		1.98
Anger of the ancestors	0.53		2.11
Mothers refusal to dedicate the newborn to the gods of the land	0.49		2.02
Marital unfaithfulness of the woman to her husband	0.46		2.09
Attacks in the dream	0.46		2.49
Witches' attack		0.81	2.03
Charms' attack from the enemy		0.78	1.99
"Abiku" or "Ogbanje" spirit		0.73	1.85
Attacks of ancestral spirits		0.68	1.86
Jealous relatives		0.66	1.89
Evil eyes of the co-wives		0.48	2.34
Destiny		0.41	2.59
Eigenvalues	5.71	2.00	
% of variance	28.53%	9.96%	

infant mortality based on 11 items and accounted for nearly 29% of the variance explained in the original 20 items. The second factor was interpreted as spirits related to cultural beliefs of infant mortality based on seven items. This factor accounted for nearly 10% of the variance explained in the original 20 items. Two items, "the will of god" and "inherited general curses" from the original 20 items were dropped because of low factor loadings (below .40). Cronbach's alpha for both factors were above 0.80: rituals was 0.85 and spirits was 0.84. Thus, these two factors with their mean scores using the original Likert scale were used as part of the CBIMQ as CBIM-R (rituals) and CBIM-S (spirits) for subsequent analyses. Table 3 shows correlations among the main study variables, including for CBIM-R and CBIM-S.

To test whether or not participants' disposition to cultural beliefs of infant mortality with rituals and spirits varied by age, education, and income, we conducted hierarchical linear regressions separately for rituals and spirits. Furthermore, to test whether or not there were any differences between urban and rural mothers and among ethnic groups and religious groups, we conducted separate analysis of covariance (ANCOVA). We furthermore conducted an ANCOVA to see if there were any differences by marital status. In these tests, locality (urban vs. rural), ethnicity (Hausa/Fulani, Igbo, Yoruba, and "other"), and religious affiliation (African Traditional Religion, Christianity, and Islam) separately served as independent variables and cultural beliefs of infant mortality, CBIM-R and CBIM-S, served as dependent variables.

4.2. Cultural Beliefs of Infant Mortality Related to Rituals and Spirits

4.2.1. How do These Cultural Beliefs Related to Infant Mortality Vary by Age, Education, and Income? In testing our hypothesis on whether cultural beliefs of infant mortality among working mothers in Nigeria would vary by age, education, and income, we used a hierarchical linear regression analysis to better understand the independent effects of each variable. In Step 1, age was entered. Step 2 included education, and Step 3 included income. Separate regression analyses were conducted for CBIM-R and CBIM-S (Tables 4–5).

Table 3: Bivariate correlations and descriptive statistics among main study variables.

Variable	1	2	3	4	5
1. Age	1.0				
2. Education	0.08***	1.0			
3. Income	0.13**	0.25**	1.0		
4. Rituals	−0.07**	−0.08**	0.07**	1.0	
5. Spirits	−0.02	−0.05*	0.10**	0.41**	1.0
M	2.24	2.56	2.05	2.12	2.08
SD	0.96	1.06	0.79	0.52	0.69

* $p < 0.05$; ** $p < 0.01$.

Regression analyses for CBIM-R revealed that age, education, and income were significant predictors (Table 4), with each variable significantly predicting respondents' cultural beliefs of infant mortality related to rituals. It appears that older respondents with less education and higher income are more likely to endorse cultural beliefs of infant mortality related to rituals compared to younger respondents with more education and lower income. Regression analyses for CBIM-S revealed that education and income, but not age, predicted cultural beliefs of infant mortality related to spirits (Table 5). Respondents with less education but higher income were more likely to endorse cultural beliefs of infant mortality related to spirits. Collectively, it appears that income has the strongest relationship with this set of cultural beliefs related to infant mortality.

Table 4: Hierarchical regression analysis for variables predicting ritual beliefs ($N = 2400$).

Variable	B	SEB	β	R_2	ΔR_2
Step 1					
Age	−0.04	0.02	−0.07	0.005**	
Step 2					
Education	−0.04	0.02	−0.07	0.010***	0.005***
Step 3					
Income	0.07	0.03	0.11	0.022***	0.011***

$*p < 0.05$. $**p < 0.01$. $***p < 0.001$.

Table 5: Hierarchical regression analysis for variables predicting spirits beliefs ($N = 2400$).

Variable	B	SEB	β	R_2	ΔR_2
Step 1					
Age	−0.02	0.02	−0.02	0.001	
Step 2					
Education	−0.03	0.01	−0.05	0.003*	0.002*
Step 3					
Income	0.11	0.02	0.13	0.02***	0.02***

$*p < 0.05$. $**p < 0.01$. $***p < 0.001$.

4.2.2. How do Mothers Vary by Locality, Ethnicity, Religion, and Marital Status? We examined whether cultural beliefs of infant mortality among working mothers in Nigeria would vary by locality, ethnicity, religious affiliation, and marital status by employing a series of ANCOVAs. The dependent variables were CBIM-R and CBIM-S. After controlling for age, education, and income, the ANCOVA yielded a significant effect for the covariates of education, F (1, 2393) = 33.18, $p < 0.001$, income, F (1, 2393) = 40.89, $p < 0.001$, and the independent variable of marital status, F (3, 2393) = 21.20, $p < 0.001$, for CBIM-R. This latter effect accounted for under three percent of the total variance. The ANCOVA for CBIM-S demonstrated a significant effect for the covariates of age, F (1, 2393) = 45.81, $p < 0.001$, education, F (1, 2393) = 6.55, $p = 0.011$, income, F (1, 2393) = 28.19, $p < 0.001$, and the independent variable of marital status, F (3, 2393) = 49.89, $p < 0.001$; this effect accounted for under six percent of the total variance. Bonferroni's corrected multiple comparison tests showed that married mothers were less supportive of rituals (adjusted $M = 2.04$, $SE = 0.02$, 95% $CI = 2.01$–2.07) compared to single mothers (adjusted $M = 2.21$, $SE = 0.02$, 95% $CI = 2.17$–2.24, $p < 0.001$), divorced/separated mothers (adjusted $M = 2.30$, $SE = 0.07$, 95% $CI = 2.17$–2.43, $p < 0.001$), and widowed mothers (adjusted $M = 2.29$, $SE = 0.08$, 95% CI = 2.14–2.44, $p = 0.007$) when controlling for age, education, and income. No differences were found among the latter three groups. For cultural beliefs of infant mortality related to spirits, single mothers were less supportive (adjusted $M = 1.87$, $SE = 0.02$, 95% $CI = 1.83$–1.91) compared to married mothers (adjusted $M = 2.23$, $SE = 0.02$, 95% $CI = 2.19$–2.27, $p < 0.001$), divorced/separated mothers (adjusted $M = 2.40$, $SE = 0.09$, 95% $CI = 2.23$–2.57, $p < 0.001$), and widowed mothers (adjusted $M = 2.31$, $SE = 0.10$, 95% $CI = 2.11$–2.50, $p = 0.001$; see Table 5) when controlling for age, education, and income.

The ANCOVA results for locality demonstrated a significant effect for the covariates of age, F (1, 2395) = 12.39, $p < 0.001$, education, F (1, 2393) = 24.16, $p < 0.001$, income, F (1, 2393) = 25.94, $p < 0.001$, and the independent variable of locality, F (1, 2395) = 37.99, $p < 0.001$, for CBIM-R; this effect accounted for less than two percent of the variance. For CBIM-S, the ANCOVA yielded a significant effect for the covariates of age, F (1, 2395) = 3.92, $p = 0.048$, education, F (1, 2393) = 12.46, $p < 0.001$, income, F (1, 2393) = 42.19, $p < 0.001$, and the independent variable of locality, F (1, 2395) = 83.53, $p < 0.001$. The latter effect accounted for less than four percent of the total variance. Women living in rural areas were less supportive of rituals (adjusted $M = 2.07$, $SE = 0.01$, 95% $CI = 2.04$–2.09, $p < 0.001$) compared to women living in urban areas (adjusted $M = 2.19$, $SE = 0.02$, 95% $CI = 2.16$–2.22) when controlling for age, education, and income. In contrast, women living in urban areas were less supportive (adjusted $M = 1.95$, $SE = 0.02$, 95% $CI = 1.91$–1.99, $p < 0.001$) of cultural beliefs related to spirits compared to women living in rural areas (adjusted $M = 2.20$, $SE = 0.02$, 95% $CI = 2.16$–2.23) when controlling for age, education, and income.

For ethnicity, the ANCOVA results showed a significant effect for the covariates of age, F (1, 2393) = 10.70, $p < 0.001$, education, F (1, 2393) = 30.67, $p < 0.001$, income, F (1, 2393) = 34.73, $p < 0.001$, and the independent variable of ethnicity, F (3, 2393) = 14.37, $p < 0.001$, for CBIM-R; this effect accounted for less than two percent of the total variance. The results for CBIM-S demonstrated a significant effect for the covariates of education, F (1, 2393) = 6.21, $p = 0.013$, income, F (1, 2393) = 42.28, $p < 0.001$, and the independent variable of ethnicity, F (3, 2393) = 174.64, $p < 0.001$. This latter effect accounted for nearly 18 percent of the total variance. Upon closer examination, post hoc analyses using Bonferroni's corrected multiple comparison tests showed that those who were identified as Hausa/Fulani (adjusted $M = 2.05$, $SE = 0.02$, 95% $CI = 2.01$–2.09) were less likely to endorse rituals compared to the Igbo (adjusted $M = 2.13$, $SE = 0.02$, 95% $CI = 2.10$–2.16, $p = 0.013$), Yoruba (adjusted $M = 2.15$, $SE = 0.03$, 95% $CI = 2.10$–2.20, $p = 0.02$), and "others" identified individuals (adjusted $M = 2.42$, $SE = 0.05$, 95% $CI = 2.31$–2.52, $p < 0.001$) when controlling for age, education, and income. Differences were also found for Igbo and Yoruba when compared to "others" at $p < 0.001$. With spirits, Igbo members were less likely to endorse these beliefs (adjusted $M = 1.80$, $SE = 0.02$, 95% $CI = 1.77$–1.84), compared to Hausa/Fulani (adjusted $M = 2.40$, $SE = 0.03$, 95% $CI = 2.35$–2.45, $p < 0.001$) and "others" (adjusted $M = 2.62$, $SE = 0.07$, 95% $CI = 2.49$–2.74, $p < 0.001$), with marginal differences between the Hausa/Fulani and Yoruba groups (adjusted $M = 2.29$, $SE = 0.03$, 95% $CI = 2.23$–2.35, $p = 0.051$) when controlling for education and income. Differences were found when comparing Igbo and Yoruba at $p < 0.001$.

Findings concerning religious affiliation demonstrated a significant effect for the covariates of age, F (1, 2394) = 14.28, $p < 0.001$, education, F (1, 2394) = 22.51, $p < 0.001$, income, F (1, 2394) = 28.46, $p < 0.001$, and the independent variable of religious affiliation, F (2, 2394) = 9.76, $p < 0.001$, for CBIM-

R. However, this effect only accounted for less than one percent of the total variance. ANCOVA results for CBIM-S yielded a significant effect for the covariates of education, F (1, 2394) = 9.49, $p = 0.002$, income, F (1, 2394) = 15.57, $p < 0.001$, and the independent variable of religious affiliation, F (2, 2394) = 85.90, $p < 0.001$; this effect accounted for nearly seven percent of the total variance. Specifically, respondents who were identified with Islam were less likely to endorse rituals (adjusted $M = 2.08$, $SE = 0.02$, 95% $CI = 2.05$–2.12) compared to those who affiliated with an African traditional religion (ATR; adjusted $M = 2.35$, $SE = 0.06$, 95% $CI = 2.23$–2.46, $p < 0.001$) but only marginally so compared to those who were identified as Christians (adjusted $M = 2.14$, $SE = 0.01$, 95% $CI = 2.11$–2.17, $p = 0.018$) when controlling for age, education, and income; differences were also found between the Christian and ATR groups ($p = 0.002$). With spirits, Christians were less likely to endorse them (adjusted $M = 1.94$, $SE = 0.02$, 95% $CI = 1.91$–1.98) compared to the Islam group and (adjusted $M = 2.29$, $SE = 0.02$, 95% $CI = 2.24$–2.33, $p < 0.001$) and ATR group (adjusted $M = 2.50$, $SE = 0.08$, 95% $CI = 2.35$–2.65, $p < 0.001$) when controlling for education and income; Islam and ATR differed at $p = 0.02$. Collectively, findings showed that women who were married, living in rural areas, affiliated with Islam, or from the Hausa/Fulani group endorsed less so cultural beliefs of infant mortality related to rituals. In contrast, those women who were single, living in urban areas, Christian, or from the Igbo group were less supportive of cultural beliefs of infant mortality related to spirits.

5. Discussion

The present study investigated the cultural beliefs of infant mortality with Nigerian working mothers. We examined how these cultural beliefs might vary by age, education, and income with working mothers. We furthermore examined how these cultural beliefs might be different depending on mothers' locality, ethnicity, religious affiliation, and marital status. Our findings were somewhat mixed given our hypotheses and showed more nuances in working mothers' disposition towards cultural beliefs of infant mortality. First, our findings showed that cultural beliefs can be separated into those based on rituals and those based on spirits. Second, cultural beliefs of infant mortality related to rituals and spirits consistently were related to income such that, unexpectedly, endorsement of both cultural rituals and spirits was associated with participants' higher income. In contrast, those mothers who were less educated endorsed more of both cultural rituals and spirits. Finally, it appears that older women compared to younger mothers were more likely to endorse cultural rituals but not cultural spirits of infant mortality.

These findings by income are consistent with past studies such as those by [29, 30] who found that socioeconomic status has a strong relationship to mothers' disposition to cultural beliefs and that these beliefs are still strong among mothers in Nigeria. Reference [29], for example, observed differences in the attribution of women with high and low income. Our results showed that mothers who earn a high income (i.e., $250 and above monthly income) have a higher likelihood of being positively disposed to cultural beliefs of infant mortality with both rituals and spirits. Most high-income earners are capable of accessing traditional and medical forms of treatment, and more often traditional explanations seem to appeal to the ordinary African women. This view is supported by [31] who found that modern health care facilities are often sought only as a secondary form of care when traditional healing has failed.

Age appears to have a strong relationship with mothers' cultural beliefs of infant mortality but contained to rituals and not spirits. Interestingly, our findings showed that older mothers were more likely to have a positive disposition to cultural beliefs of infant mortality related to rituals. These findings are consistent with a report by [32] which states that exposure of different age groups to life issues shapes their views of life experience. However, this observation is at variance with the views of [6] who argued that women are similar when it comes to issues of cultural and superstitious beliefs, regardless of their age and the type of work they do. Reference [26] noted that cultural beliefs are the commonly held norms and moral standards of a society and these beliefs are usually rooted in the culture's symbolic inheritance. As such, it is possible that this age effect is due to the level of exposure of the young working mothers with information on cultural beliefs; older mothers tend to subscribe to the cultural beliefs of infant mortality related to cultural rituals but not to cultural spirits.

With respect to education, results showed that more educated mothers were less likely to endorse cultural beliefs of infant mortality related to both rituals and spirits. Although these findings are not congruent with those of [33] who found a direct correlation among maternal education, cultural beliefs and infant mortality in Nigeria and of [34] who affirmed that educated men and women such as professors, medical doctors, and teachers are also influenced by cultural beliefs, regardless of one's educational qualification, it may be the case that Western influence in contemporary Nigerian society has shifted the cultural beliefs of more educated mothers who are actively participating in the workforce.

In addition to age, income, and education, marital status had a strong relationship with the cultural beliefs of working mothers but in more nuanced ways than expected, with married mothers endorsing less cultural rituals but more so cultural spirits. Although researchers such as [32] have noted that cultural beliefs are widely shared and that people are born into a cultural setting that shapes their belief system, others such as [8] have discovered that the cultural beliefs of married women in the northern part of Nigeria are different from others. Reference [8] explained that girls are brought up in a stigmatized low status and they grow up with a very low concept compared to girls exposed to Western cultures. Interestingly, widowed mothers and divorced/separated mothers were more likely to positively endorse cultural beliefs of infant mortality across both cultural beliefs of infant mortality related to rituals and spirits. A possible explanation for these latter findings could be that the cultural traumatic experiences as a function of the death of or

separation from their husband may have led to stronger cultural beliefs; these same cultural beliefs may be relevant with respect to infant mortality. At the same time, since married mothers have not had these traumatic experiences, they may have not had to rely on cultural rituals of infant mortality yet.

Locality, religion, and ethnicity were found to have a relationship with the cultural beliefs of infant mortality among working mothers. Our findings regarding locality were more nuanced such that mothers living in rural areas were more supportive of cultural beliefs of infant mortality related to spirits but less supportive of cultural beliefs of infant mortality related to rituals when compared to mothers living in urban areas. These findings are consistent with the opinion of those who are in urban areas, many of whom believe that children die as a function of the mother's approach (e.g., carelessness) and diseases afflicting children (e.g., malaria, pneumonia, measles, and diarrhea). In contrast, these findings vary from those in focus group discussions (FGD) that we conducted which revealed that mothers from the rural areas tended to agree that the death of an infant is mostly due to the fact that mothers did not perform some necessary rituals at the birth of the baby. These differences may be related to the cultural beliefs' questionnaire being separated into two dimensions, rituals and beliefs, providing a finer analysis of mothers' cultural beliefs. Still, it appears that these findings, at least with respect to spirits, are consistent with those of [35] who affirmed that cultural beliefs have a strong influence in rural communities.

As expected, respondents who were affiliated with an African traditional religion were more likely to endorse both rituals and spirits. Interestingly, findings demonstrated unexpected differences by group affiliation. Respondents who were identified with Islam were less likely to endorse rituals, whereas those who were identified with Christianity were less likely to endorse spirits. These findings are in contrast with those from an earlier study that discovered that cultural beliefs cut across religious boundaries [34]. Contrary to our expectations, Hausa/Fulani respondents were less likely to endorse rituals, whereas Igbo respondents were less likely to endorse spirits. However, ethnicity accounted for the greatest variance for cultural spirits. These findings are consistent with those of [29] who revealed differences in the beliefs of infant mortality among the Igbos, Hausas, and the Yorubas, though some similarities in cultural beliefs do exist. On this latter point, [26] noted some common cultural beliefs held by the three ethnic groups in Nigeria. It is generally believed that there are some children born into the world with some psychic power who are called "*Abiku*" among the Yorubas and "*Ogbanje*" among the Ibos. Reference [27] also affirmed that the three ethnic groups have similar cultural beliefs in witches and related agents as causing death.

6. Conclusion

The present study is one of the first efforts at providing a finer analysis into cultural beliefs of infant mortality by separating these beliefs into rituals and spirits and systematically investigating how these rituals and beliefs may vary along a number of critical dimensions. Whereas in previous studies researchers have generally suggested that cultural beliefs may be related to infant mortality, the present study has systematically demonstrated how relevant cultural spirits and rituals may be related to age, income, and education, as well as religious and ethnic affiliation, locality, and marital status. While findings have shown rituals and spirits in relation to cultural beliefs of infant mortality, it is important to keep in mind that the latter was accounted for more so by the main study variables. Although limitations of this study are that it is more descriptive in nature and does not represent all groups (e.g., sample is younger and more educated) in Nigeria, it is still important to understand how the present study's factors may be related to cultural beliefs if these beliefs prevent mothers and family members from seeking medical assistance for issues that seeming are preventable with culturally appropriate programs, counseling, and public policy.

6.1. Implications. Guidance and counseling are based on the assumptions that every individual in any society will have, at some point, a problem that he or she cannot solve independently. Based on this assumption, counselors and practitioners need to acquaint themselves with cross-cultural issues that may arise in settings where they may be counseling or advising their clients or patients. This study looks deeper into the ways in which cultural beliefs may be related to infant mortality and provides material to better understand and devise programs that shed more light on the ways in which cultural beliefs may play out in different settings and with different groups. For example, researchers and practitioners may want to use a targeted approach where they design programs for younger and single mothers for early prevention and for married mothers in rural areas for intervention practices to address cultural beliefs and infant mortality. As such, this study contributes to a body of work that sheds more light on how understanding people's cultural background can enhance the quality of a counselor's or practitioner's interaction with a client. This dimension should be put into consideration when counseling or advising mothers on issues related to infant mortality in Nigeria. Counselors need to appreciate the uniqueness of our cultural norms especially in the counseling process.

6.2. Recommendations. The Nigerian government should mount advocacy programs to educate mothers on the prevention and treatment of sick children. This will help mothers access medical facilities instead of traditional means such as herbalists. Counseling centers should be established in the ministries and federal parastatal as well as specific regions so that mothers can access the services of a counselor. These facilities should also be replicated in all the teaching hospitals across the country. Also, counselors, practitioners, nurses, and medical doctors should organize lectures, symposia, and seminars as a way of eradicating unfounded cultural beliefs on infant mortality—rituals,

spirits, or otherwise—and improving the child and mothers' health in Nigeria.

Data Availability

No data were used to support this study.

Ethical Approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the university's institutional research committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

Consent

Permission was obtained from various ministries and the village heads before contacting respondents. Informed consent was obtained from all respondents in this research study.

Conflicts of Interest

The authors declare that they have no conflicts of interest regarding the publication of this paper.

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