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Gender Inequality: An Examination of the Islamic Religious Affiliation and Female Infant Mortality Rates among Muslim Wives in Nigeria

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Abstract

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Jodie Denise Sanders

MS, Walden University, 2015

BS, Alabama Agricultural and Mechanical University, 2009

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

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November 2022

Abstract

Muslim-majority countries of low socioeconomic status have higher rates of poor health and infant mortality. Among the six regions of Nigeria, Islamic religious affiliation is more common in the country's Northern region. Gender inequality is one of the most critical issues in the Muslim community. Female children are more likely to die because of gender inequality. Previous research has been conducted on gender inequalities and religion; however, researchers have not determined if a relationship exists between Islamic religious affiliation and female infant mortality rates among Muslim wives across the six regions of Nigeria. This study used a quantitative correlational research design grounded in the socioecological model to determine if residing in any of the six regions of Nigeria and Islamic religious affiliation influenced female infant mortality rates among Muslim wives after adjusting for age, education, and wealth index. Using the 2018 Nigeria Demographic and Health Survey, a multiple regression analysis was conducted on a population of 28,361 women who identified as wives residing in Nigeria. Results were that religious affiliations ($p < .001$), marital status ($p = 0.036$), and sex of the child ($p = 0.038$) were significantly associated with infant mortality rates. Social change implications included the potential to create religious-based support systems for such women and implement healthcare initiatives to increase survival from birth to age 1 for children of Muslim women.

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Dedication

I want to dedicate this research to my daughter Jaidyn D. Sanders. I love you with all my heart. I pray that I have demonstrated that the sky is the limit to achieving your dreams and goals. I would also like to thank my support system for motivating me to push forward when times were rough. Thank you to my mother (Tameca), my second dad (Paul), my daddy (Rodney), and my father (George). Thank you all sincerely. Over these last few years, I have learned to push and excel through my trials and tribulations, and you all were there to support me in my most challenging moments during this journey. I love you all and thank you sincerely. I deeply appreciate you all.

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Section 1: Foundation of the Study

Introduction

This quantitative study involved examining if living in any of the six regions of Nigeria (North Central, North East, North West, South East, South South, and South West) and Islamic religious affiliation influence female infant mortality rates among Muslim wives after adjusting for age, education, and wealth index. Gender inequality is prevalent throughout society with areas of a high prevalence of low socioeconomic status and plays a significant role in healthcare. Brinda et al. (2015) said females residing in low-income and poverty areas were subjected to gender inequality. Female children were more likely to die because of gender inequality (Iqbal et al., 2018). Islamic leaders in Israel demonstrated a concern related to infant mortality rates in their culture and advocated for Muslim communities to reduce infant mortality rates among Muslim people (Cohen-Dar et al., 2017). Parents are willing to spend more time and resources to ensure better health outcomes for male-born children (Uddin et al., 2021). This research involved evaluating whether there was an association between female infant mortality rates and Islamic religious affiliation among Muslim wives across the six regions of Nigeria. I examined whether gender inequalities were found in infant mortality rates and whether females were more likely to die before they reached age 1. I examined whether there were differences between the six regions across Nigeria and how they may be impacted by religious affiliations and gender inequality among Muslim wives in the country. The research problem that was addressed was whether there was an association between where a married woman resided among the six regions of Nigeria, Islamic

religious affiliation, and the likelihood of having a female infant born to a Muslim wife who died before the age of one. Although researchers have investigated this issue, there was little literature on the association between Islamic religious affiliation and female infant mortality rates among Muslim wives in Nigeria.

According to the Central Intelligence Agency (CIA, n.d.) Nigeria is in the western region of Africa. It is the most populated country in Africa and the sixth most populated country globally, with most of its population located in the South and South West regions. In 2021, the population of Nigeria was estimated to be 219,463,862, with over 250 ethnic groups and 500 languages spoken throughout the country (CIA, n.d.). Nigeria is primarily composed of the following major religious groups: Islam (53.5%), Roman Catholicism (10.6%), Christianity (35.3%), and others (.6%) (CIA, n.d.). Nigeria will exceed its current population and increase in people, leading it to be the fourth-largest country in the world by the year 2050. The average age for women to have their first child was 20.3 years, whereas the average number of births per woman was 4.67. The current infant mortality rate was 58.23 per 1,000 live births (63.67 per male and 52.46 per male; CIA, n.d.).

Background of the Study

The West African country of Nigeria is a federal republic made up of 36 states (United States Department of State, 2021). McKinnon (2021) said Christianity is primarily practiced among Nigerians residing in the country's Southern regions, while Islamic religious affiliations were found among those residing in the Northern regions.

The Centers for Disease Control and Prevention ([CDC], 2020) defined infant mortality as the loss of a child's life before age 1. The infant mortality rate was calculated as the number of deaths of infants per 1,000 live births (CDC, 2020). Each year millions of children die before their first birthday; in 2018, four million children died within the first year of their life (World Health Organization ([WHO], n.d.). Many deaths recorded globally occur in African regions (WHO, n.d.). Several factors contribute to infant mortality rates, such as congenital disabilities, preterm births, low birth weights, pregnancy-related complications, sudden infant death syndrome (SIDS), and injuries such as suffocation (CDC, 2020). Infant mortality rates were attributed to dehydration, infection, genetic malfunction, pneumonia, measles, diarrhea, and malaria (Bolu-Steve et al., 2020). Nigeria was ranked 14th globally, having the highest number of infants who die before their first birthday at 58.23 per 1,000 live births (CIA, n.d.). The rate of infant deaths in a country is an indicator of the country's health compared to others globally (CIA, n.d.). Overall, children of African descent have a lower chance of surviving infancy, and Blacks women have the highest rates of infant mortalities globally (CDC, 2020). Maxwell et al. (2017) said Africans and those of African descent have more complications during birth, health disparities, and low socioeconomic status compared to other ethnicities comparable globally. Ninety-nine percent of all infant deaths occur in developing countries with limited infrastructure, access to proper health, and minimum practice of proper hygiene (Maxwell et al., 2017). Ensuring adequate hygiene could potentially lead to less death caused by preventable infections.

Askeer et al. (2018) said poor health and child mortality in Muslim-majority countries (MMCs) were related to government oversight, conflict in the land, and lack of empowerment among women. Bolu-Steve et al. (2020) said cultural beliefs varied according to socioeconomic status (age, education, and income). Brinda et al. (2015) said gender inequalities were more prevalent in low to middle-income countries, and health services should create future interventions in conjunction with various social change initiatives to empower women and decrease child mortality rates. Kotsadam et al. (2018) said infant mortality rates decreased for families in areas that receive help from the government. Georgetown Institute for Women, Peace, and Security, & Peace Research Institute Oslo (2019) used the Women, Peace, and Security (WPS) index to highlight the relationship between gender inequality and maternal and infant mortality rates in 144 countries. Researchers concluded that Countries that scored lowest on the Women, Peace, and Security (WPS) index had the worst maternal and infant mortality rates, suggesting that empowerment and value of women were associated with the survival of both mother and child. Less importance placed on women and their health contributes to higher maternal and infant mortality rates among developing countries (Georgetown Institute for Women, Peace, and Security & Peace Research Institute, Oslo 2019).

Undelikwo et al. (2018) said cultural practices that lead to infant mortality in Cross River State, Nigeria, are superstitious and rely on traditions as opposed to modern medicine; areas such as this have the highest infant mortality rates as those living in regions of Northern Nigeria (Undelikwo et al., 2018). Uddin et al. (2021) examined gender inequalities and how they relate to infants' survival post-discharge after birth and

found that the gender of infants, caregivers, and medical care providers played a significant role in terms of adherence to post-discharge instructions, parents seeking future treatment, and recovery of sickly infants. Families were willing to spend more money and time to ensure the health of male children. Uddin et al. (2021) said discrimination among genders could increase mortality rates in low-income countries. Brinda et al. (2015) said gender inequalities were more prevalent in low to middle-income countries and suggested future interventions be created to empower women and decrease child mortality rates. Brinda et al. (2015) said the lack of education among women was associated with increased child mortality rates.

Islam is the second largest religion behind Christianity (DeSilver & Masci, 2017). Lipka and Hackett (2017) said the number of people affiliated with the Islamic religion would supersede the global number of Christians by 2050. The number of people who practice Islam will increase twice as fast as the number of people worldwide. These projections were set to rise by 70% (1.8 billion to 3 billion by 2050); during 2015, Muslims made up 24.1% of the world's population and are projected to increase to 31.1% by 2050 (Lipka & Hackett, 2017).

Lipka and Hackett (2017) said this religious group increased due to the number of children born to Muslim families. This religious group was found to have more children than other religious groups. In addition, Muslim women were more fertile than women affiliated with various religious groups. Muslim women started giving birth on average by age 24 compared to non-Muslim women at 32 (Lipka & Hackett, 2017). On average,

Muslim women have 2.9 children compared to Christians, with 2.6 (Hackett, 2017; Lipka & Hackett, 2017).

Religion Switching

An increase in individuals converting from Christianity to Islam was another reason this religious group was increasing across the globe (Lipka & Hackett, 2017). Reasons for religion switching vary among individuals. Religious converts said they chose to change their religion as they wanted to belong to a community, wanted to get married or develop a relationship with a religious foundation, or were introduced by a friend to the Islamic religion or converted due to a public figure (Mohamed & Sciupac, 2018). Those individuals who converted to Islam were faced with religious decisions that impacted their daily lives, interaction with family members, and potential benefits, risks, and outcomes related to health decisions (Attum et al., 2021). The religiosity of the Muslim people, when switching religions, must consider the type of health care provisions sought after while maintaining their religious identity during and after conversion. Islamic beliefs, practices, and principles vary regarding health and how medical conditions are attended to and treated. For instance, when a female patient has a male medical provider, all communication must be relayed through a male, such as a spouse or family member (Attum et al., 2021). Muslims request to be seen by a member of the same sex to limit interactions with members of the opposite sex (Alqufly et al., 2019). The inappropriateness of Muslim women being treated by male medical providers can cause conflicts in their healthcare services, thus contributing to unforeseen and unfortunate health outcomes that women are not prone to think of when making the

transition between religions. Vu et al. (2016) said Muslim women have an issue with seeking medical assistance as they are afraid of receiving assistance from male providers, fearing preserving their modesty during appointments.

Lack of Contraception Use in North Nigeria

Babalola and Oyenubi (2018) said contraception use in Nigeria was the worst in Northern Nigeria, which had the poorest health outcomes for women. Islamic religious affiliations contributed to the lack of contraceptive use among women residing in the Northern regions of Nigeria. Furthermore, partnerships with religious leaders of the Islamic community would be beneficial to increasing contraceptive use among Muslim women and those residing in the Northern regions of Nigeria. Aside from contraceptive use, giving birth in highly skilled areas such as hospitals and birthing centers was low in poverty areas such as Nigeria. Women were more likely to give birth at home and had less access to skilled workers and medical professionals. Many families live in poverty across Nigeria and have limited education and income, contributing to other health disparities involving access to quality health and prenatal care Babalola and Oyenubi (2018) said that many women in Northern Nigeria were affected the most.

Sixty-six percent of poverty-stricken people in Nigeria reside in the Northern regions (Babalola & Oyenubi, 2018). According to the World Bank (2020), 83 million people living in Nigeria live below the poverty line. Babalola and Oyenubi (2018) said culture, socioeconomic factors, and religious affiliations influence Nigerians' health across the country. Southern Nigerians were better off due to the influence of Western culture and religious practices such as Christianity (Babalola & Oyenubi, 2018). Nigeria

is divided by religion, with many Muslims residing in the Northern regions and those practicing Christianity living in more southern areas of Nigeria. Babalola and Oyenubi (2018) state that Northern Nigeria lacks proper healthcare facilities due to a lack of resources and government assistance. Therefore, many healthcare facilities do not have skilled and trained professionals to serve communities across Northern Nigeria. The Southern regions of Nigeria have more healthcare facilities with qualified medical professionals and better health outcomes (Babalola & Oyenubi, 2018). Adverse maternal and infant health indicators were more prevalent in the Northern regions of Nigeria due to the shortage of medical professionals and lack of access to adequate healthcare compared to the Southern regions. Lack of education and resources in these areas increases health disparities among women and families, health risks, inadequate use of contraceptives, and increased infant mortality rates. In addition, lack of spousal support, medical provider bias, large families, and lack of family planning have decreased contraceptive use in women in Northern Nigeria (Babalola & Oyenubi, 2018).

Regions of Nigeria

Jaiyeola and Choga (2020) said the country's northernmost regions have resources for production (i.e., oil, gas, and rich agriculture). However, the country is still declining in terms of its ability to support the health of its people. The six regions of Nigeria vary in terms of their ability to support the health of their people with resources produced by each region. For example, the majority of the population in North West Nigeria lives at or below poverty levels, with the Northern regions exceeding the poverty rate at 86.4% compared to 77.7% in North East, 76.3% in North West, and 67.5% in the

North Central regions. In addition, those residing in the Northern regions were farmers and agriculturalists with minimal education. Compared to the South South, South East, and South West, all have families that live in poverty (between 8 and 25%); however, these regions were better off than those living in the Northern regions of Nigeria (Jaiyeola & Choga, 2020).

Gender Inequality

Homan and Burdette (2021) said gender inequality in marriages and religion plays a role in negatively impacting women's health. Religious affiliation could contribute to gender inequality in marriages and has been associated with adverse health outcomes in women. Gender inequality was more likely associated with women being unable to receive quality access to healthcare, resources, and support. Gender inequality among women would increase factors associated with social determinants of health. Such factors were associated with exposure to violence, stress, harassment, and low social status among women. Women in religions where gender inequality was prevalent tended to suffer from anxiety, depression, and various ailments that increase the likelihood of mortality among women. Religious affiliations contributed to mortality and morbidity among women who struggle with religious beliefs. Religion was more likely to affect women's health than men's (Homan & Burdette, 2021). These religious practices were rooted in biblical teachings that promoted men as heads of the household and women as holding more submissive positions (Hackett, 2016; Homan & Burdette, 2021); (King James Version Bible, 2022, 1Tim. 3:5, Col. 3:18). Homan and Burdette (2021) said gender inequality among religions was associated with an increase in structural sexism,

leading to inequalities in terms of resources and social capacity for women. Therefore, women who were apart of such religious affiliations often suffered mental and physical ailments while trying to uphold the religious doctrine (Homan & Burdette, 2021).

Schnabel (2016) said countries with a majority of nonreligious affiliations have better gender equality among the population. Nonreligious countries were more likely to support efforts for gender equality. Religious affiliations among people were associated with attitudes among women and sexism across religious groups. The predominant religion influences attitudes in a country. The more religious a country is, the more likely it allows gender inequality. Christians were more prone to supporting gender equality among their religious groups and communities. Christians were more inclined to allow equality among men and women than Muslims. Muslims were more prone to gender inequality among men and women in Muslim-majority countries (Schnabel, 2016).

Glick et al. (2016) described how individuals associated with Islamic religious affiliations believe in the honor system. The honor system as women expected to be submissive to their husbands and seen as helpers rather than marriage partners. Consequently, women who believe in the honor system demonstrate obedience to their husbands through religious devotion and reservations about sexual thoughts and desires throughout their marriages, as described by the researchers. The honor system, supported by religious affiliations, also entails women being subjected to violence if seen as disobedient to their spouses. Gender inequality was attributed to societies lacking law enforcement and high measures of patriarchal beliefs (i.e., male dominance, control, and belligerence), where the men were responsible for the discipline, and women were

perceived as the weaker of the two genders. Islamic texts (i.e., the Qur'an) have been found to support, justify, and influence the subordination among women in cultures with high patriarchal religious affiliations. Glick et al. (2016) noted that those who practice the Islamic faith had been taught to believe that gender inequality was expected for those affiliated with the religious group, as women are viewed as inferior to men.

Karoui and Feki (2018) reported that the education attained by Muslim women was not acknowledged or valued, as women were not seen as equals. Muslims consider educating a woman the same as providing education throughout her family, which is viewed as the woman is more educated than her male counterparts (Karoui & Feki, 2018). The inequality surrounding men and women in the Islamic religious group was heavily divided due to the rules outlined in the Qur'an, which males have interpreted over the years (Darzi et al., 2021). Muslim countries with lower levels of education for women were among the developing countries (Karoui & Feki, 2018). As practices that created gender inequalities were reduced in Muslim countries, the demand for greater equality among males and females was improved, thus leading to higher education among Muslim women. Muslim countries must utilize all their resources, and women are essential to the economy's growth; however, they are not granted equal employment opportunities, which leads to economic growth for MMCs, due to the ideology of being the keeper of the home as outlined in previous religious doctrine which men have interpreted. Educating women in Muslim countries increased economic growth. Karoui and Feki (2018) said that women receiving education in Muslim countries could raise capital; however, limiting the fertility opportunities of women decreased the rate of infant mortality. Therefore,

stimulating the economy by promoting education for both men and women of future generations, as suggested by Karoui and Feki (2018).

Infant Male Versus Female Mortality Rates

Salawu et al. (2021) noted that the risk of male-born children dying before their first birthday was increased in low-income countries such as Nigeria. Iqbal et al. (2018) noted that females born in areas of vast gender inequalities were associated with higher infant and child mortality rates. Such outcomes occurred in lower- to upper-middle-income countries, and lower-income countries incorporate strategies to prevent inequalities among genders, especially those surrounding access to health care. Strategies incorporated to improve maternal health were essential to decreasing the rate of infant mortalities in lower-income countries. Education, income, and other factors associated with social determinants of health contribute to increased infant mortality rates worldwide. Societies deemed unequal for all genders tend to produce more struggles for female infants and children. Children were more prone to increased mortality rates if they were born in areas of increased poverty, a rural environment with limited household amenities, or born to a mother with little education. As significant importance was placed on cultural values in societies with a high prevalence of male dominance, women and children were disadvantaged when utilizing resources such as access to health, education, and income. The increase of male superiority placed on male-born children had been the foundation for demonstrating that females were inadequate or less important than males from birth (Iqbal et al., 2018).

Qur'an

The Qur'an is the book of the Islamic religious faith practiced by Muslims (Encyclopedia Britannica, 2021b.). The Qur'an is a sacred book of God's words as written by the prophet Muhammad through the words of the archangel Gabriel (Encyclopedia Britannica, 2021b.). Glick et al. (2016) noted that the Qur'an explicitly states that all humans are equal; however, through the interpretations by men, the Qur'an has been interpreted to believe that men were superior and dominant to women and women were to be obedient and submissive to men as they were affiliated with this religious group. Naima Dib noted that the Qur'an had been misinterpreted over the years to believe that men were superior and women were inferior and submissive beings according to the word of the scriptures (Darzi et al., 2021). Darzi et al. (2021) noted that males had performed the early interpretations of the Qur'an, leading to subjective thinking on the scriptures written by the prophet Muhammed.

Islamic Ethics Related to Gender

Jomaa Ahmed (2020) noted that Muslim societies typically have struggles related to gender inequalities and poverty and reside under dictator types of authorities and ruling, which increased the need for women to be submissive throughout this culture; disadvantages in this culture prohibit population growth and further disrupt equality among men and women. Gender inequality among Muslim societies s defaulted communities negatively impacts populations' social and economic status. Countries with a high prevalence of practicing Muslim practices were not among countries where women could work and garner financial stability and independence. Muslim countries

have the “worse Global Gender Gap Index” (p.337). The Gender Gap Index, as described by Stoet and Geary (2019), measures gender equality relative to gaps in education, health, politics, and the economy among men and women. Jomma Almed (2020) said the gap between men and women in Muslim cultures could take more than 50 years to see improvement for women throughout such countries. Jomma Almed (2020) said that the Qur'an instructs men to take care of women; however, traditional views have been interpreted in a manner in which men find themselves superior to women and value women as unequal. Naima Dib said that the Qur'an had been misinterpreted over the years to believe that men were superior and women were inferior and submissive beings according to the word of the scriptures (Darzi et al., 2021). Thus, leading to unethical religious beliefs and practices among those affiliated with the Islamic religion. Jomaa Ahmed (2020) described unethical behaviors among those associated with the Islamic religion as greed, the need for power, egotistic behavior, introversion, and envy.

Infant Mortality in Nigeria

Kotsadam et al. (2018) noted that infant mortality was prevalent in developing countries such as Nigeria. The researchers mentioned that the infant mortality rates were higher among those living in poverty and socioeconomic disparities, such as in Northern Nigeria. Researchers noted that infant mortality was higher among those affiliated with the Islamic religion and was more prevalent among women lacking education. They also found that among such religious groups, Muslims experience bias when health improvement projects are set up in areas of higher mortality prevalence and those that experience higher rates of infant mortality. The researchers noted that infant mortality

was subjected to various factors and increased in developing countries such as Nigeria. The researchers noted multiple factors contributing to infant mortalities among Nigerians, including the mother's overall health, complications during pregnancy, the likelihood of disease prevalence, infections, the use of health service providers, and vaccinations and immunizations. Other factors include the accessibility to clean water, sanitation, food, income, and education of the parents (more likely that of the mother) (Kotsadam et al., 2018).

Kotsadam et al. (2018) noted that infant mortality could be decreased in poverty-stricken areas as education and resources were increased. As previously mentioned, education among women can improve the economic status of the family and the country (Karoui & Feki, 2018). An increase in education among Muslim women would decrease the fertility rate, thus discouraging women from receiving education and promoting self-sufficiency, as many women would be deemed better educated than the men of the culture (Karoui & Feki, 2018). Increasing education in areas such as Northern Nigeria can increase the survival rate of infants, thus decreasing the mortality rate of children residing in poverty-stricken areas and low education among women; the researchers noted that infant mortality was higher for Muslim women (Kotsadam et al., 2018). Muslims were found to have less education and income, according to Kotsadam et al. (2018). Adebowale et al. (2017) stated that Nigeria was ranked high for yearly infant mortalities across the African continent. The increased fertility rate among Nigerian women was directly associated with the number of children who did not reach their first

birthday. The lack of contraceptive use contributes to increased pregnancies throughout this African country (Adebowale et al., 2018).

Salawu et al. (2021) said that the infant mortality rate across Nigeria was 67 deaths per 1,000 live births. The infant mortality rate increased among those infants delivered in the Northern regions of Nigeria (i.e., North East and North West). Women in Nigeria had increased high-risk birth behavior determining their children's survival and contributing to the infant mortality rate. Preexposure to small birth weights, inability to receive appropriate immunizations and the lack of contraceptive use increased the likelihood of infant mortality for those born in Northern Nigeria.

Salawu et al. (2021) said the infant mortality rate in Nigeria as a receipt of health status throughout the population among the type of health care and prenatal care available to this country's people. Infant mortality rates had decreased worldwide except in Nigeria. Nigeria is affected by the increase in infant mortalities due to the prevalence of preventable diseases, pregnancy-related complications, socioeconomic factors, and the genetic makeup of the expecting mother. The higher the number of high-risk birth behaviors the expecting mother demonstrates, the likelihood of a child losing their life before their first birthday. An increased number of childbirths among expecting mothers has been associated with an increased risk of infant mortality among Nigerians. Salawu et al. (2021) said the increase in births and high-risk birth behaviors among women living in Nigeria are associated with low socioeconomic status. Lack of education and training have demonstrated that many women residing in such areas of Nigeria were subjected to

neglect; thus, their children were less likely to survive and risk losing their lives before their first birthday (Salawu et al., 2021).

Problem Statement

Gender inequality is prevalent throughout society and plays a significant role in health care. Lussier and Fish (2016) defined gender inequality as one of the most critical issues in the Muslim community. Muslim-majority countries (MMCs) that depend on natural resources for economic stability rather than the principles aligned with the Islamic faith have higher instances of gender inequality (Lussier & Fish, 2016). Nigeria has one of the world's largest populations of Muslims, at 53.5 %, with much of the Muslim population residing in Northern Nigeria (CIA, n.d.). Brinda et al. (2015) also noted that females living in low-income and poverty areas were highly subjected to gender inequality. Female children were more likely to die because of gender inequality (Iqbal et al., 2018). Islamic leaders in Israel have demonstrated a concern related to infant mortality rates in their culture; they were willing to advocate for the communities to reduce the infant mortality rates among Muslim people (Cohen-Dar et al., 2017). The 2018 Nigeria Demographic and Health Survey concluded that two in three women between the age of 15 to 49 residing in one of the six regions of Nigeria receive proper prenatal care; of those born to these women, only two out of five births were conducted in a health care delivery center, and one in eight children would die before their fifth birthday.

Uddin et al. (2021) said parents were more willing to spend more time and resources to ensure better health outcomes for male-born children. (This research

evaluated whether there was an association between female infant mortality rates and Islamic religious affiliation among Muslim wives across the six regions of Nigeria. The research problem that was addressed through this study was whether there was an association between where a married woman resided among the six regions of Nigeria (North Central, North East, North West, South East, South South, and South West), Islamic religious affiliation and the likelihood of a female infant born to a Muslim wife dying before the age of one.

Purpose

The purpose of this quantitative study was to examine if the location or region of residence in Nigeria (any of the six regions North Central, North East, North West, South East, South South, and South West) and Islamic religious affiliation are associated with female infant mortality rates among Muslim wives after adjusting for age, education, and wealth index.

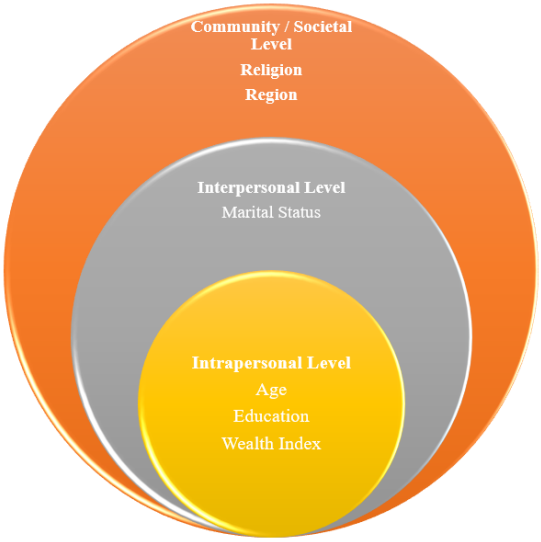
Theoretical Framework

The logical connections between the framework presented and the nature of this study include the social-ecological model. The social-ecological model (SEM) consists of the interaction between individuals, relationships, community, and societal factors and how they influence behavior (Hayden, 2019). SEM demonstrates how varying elements influence health status from pregnancy to birth by identifying factors contributing to the relationships between oneself and others, the type of medical care provided during and after pregnancy, social and cultural norms, and community involvement (Kim et al., 2018). SEM demonstrated whether female infant mortalities were influenced by Islamic

religious affiliation among Muslim wives across the six regions of Nigeria. The relationships among Muslim women and their families and community and societal standards were evaluated to determine if any significant association exists between Islamic religious affiliation and female infant mortality rates while controlling for age, education, and wealth index. SEM evaluated varying factors and how they contribute to female infant mortality rates among Muslim wives across the six regions of Nigeria. Three of the five levels associated with SEM (i.e., intrapersonal, interpersonal, and societal) were used to discuss the relationships between the identified variables regarding infant mortality rates such as religion, relationship to head of household, regions, age of the infant at death, and sex of child while controlling for age, education, and wealth index.

Figure 1.

Social-Ecological Model using Variables



SEM was used in this doctoral study as it contributes to a researcher's understanding of the behavior of an individual or a population while viewing the influences provided through internal and external factors. Urie Bronfenbrenner created SEM in 1974 (Hayden, 2019). SEM describes varying factors in an individual's life that can influence their behavior. The five levels of SEM describe how behaviors are influenced by self, relationships, community, and public policy. Using these levels, one can understand how relationships are influenced. Each level builds on the previous level predicting the outcome of the individual's behavior. The core of the model in which every influential factor encompasses is the individual, also known as the intrapersonal level. This level includes the individual's beliefs, attitude, health literacy, and self-efficacy when adopting and implementing a new behavior. The next level, called intrapersonal, includes the relationships that the individual has established that influence their behaviors. For example, the intrapersonal level includes the opinions of others close to an individual and examines how they play a role in the success or failure of the behavior. Such relationships have family, friends, healthcare providers, and the individual's colleagues or coworkers, as Hayden (2019) mentioned.

The third level focuses on the institutional influences that aid in adopting new behaviors in an individual. "Rules, regulations, and policies" are common factors influencing an individual's behavior (Hayden, 2019p. 230). The community is the fourth level, and it also includes the rules outlined in activities in which the individual is associated or plays a role. Such factors include being a committee member and participating in a community outreach program. The final level of the model is the

societal level. The normalcy associated with an individual's social life and culture can influence new behavior at the societal level. This study evaluated influences according to the interpersonal, intrapersonal, and societal levels and how they influenced the infant mortality rates among Muslim wives residing in Nigeria according to religious affiliation.

Nature of the Study

To address the research questions of this quantitative study, I performed a multiple regression analysis using secondary data from the Nigeria Standard Demographics and Health Survey 2018 with a causal-comparative research design to understand how regions in Nigeria and Islamic religious affiliation are associated with female infant mortality rates among Muslim wives. The Durbin-Watson statistic was used to test for autocorrelations between the independent and dependent variables. The values for the Durbin-Watson statistic range from zero to four, whereas values less than two indicate a positive autocorrelation, values greater than two indicate a negative autocorrelation, and a value of two represents no autocorrelation (Kenton, 2021).

The 2018 Nigeria Standard Demographics and Health Survey contains all the variables needed to conduct the study, religion, relationship to head of household, regions, age of the infant at death, and sex of child while controlling for age, education, and wealth index.

The wealth index was defined as "scores based on the number and kinds of consumer goods they own, ranging from a television to a bicycle or car, and housing characteristics such as a source of drinking water, toilet facilities, and flooring materials" (Nigeria Standard Demographics and Health Survey 2018, p.15). These scores were

derived using … the household score of each usual (de jure) household member, ranking each person in the household population by her or his score, and then dividing the distribution into five equal categories (Poorest, Poorer, Middle Richer, Richest), each comprising 20% of the population. (p.15). Both Figure 2 and Table 1 display the wealth index for the total population of the doctoral study. Tables 2-13 provide an overall breakdown of the items included in the wealth index section of the household survey.

This study is significant because research on gender inequality among Islamic religious affiliation and female infant mortality rates is limited to the best of my knowledge. The study's significance is that it may better understand the support Muslim wives need to increase their infant daughter's survival rate. This study may contribute to public health by providing evidence on the factors contributing to infant mortality among females in regions across Nigeria where the Islamic religion is practiced. Findings from this may foster the development of culturally appropriate interventions to meet the Muslim community's specific needs. Strategies could be identified to reduce further deaths through increased knowledge about the risks associated with female infant mortalities. Although current interventions do not include gender-specific discharge instructions, future interventions could include such information to host open discussions regarding the challenges in caring for a female infant in areas that practice the Islamic religion across Nigeria.

This study's social change implications for health educators and providers may include collaborating with community, state, and government organizations to develop

female infant mortality prevention interventions that prioritize Muslim wives. The intervention could consist of the support of family, friends, and religious leaders to create accountability for female infants' survival from birth to their first birthday. Health policy planners may also utilize the study findings to conduct health promotion campaigns via the hospital and birthing centers targeting Muslim women, which may improve infant-related health outcomes.

Figure 2.

Wealth Index of Total Population

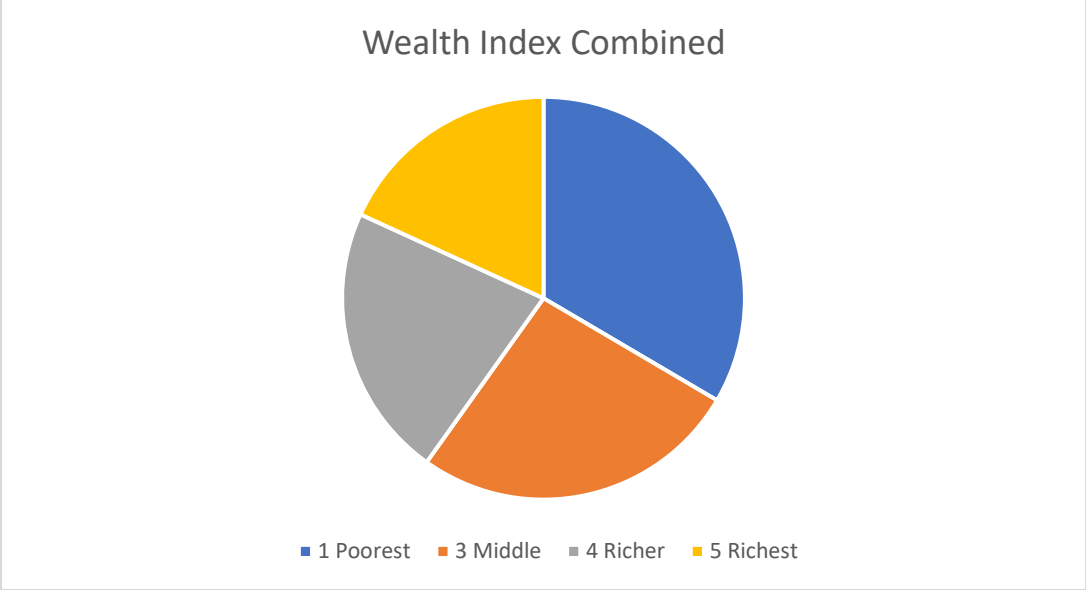


Table 1

Wealth Index Combined

		Frequency	Percent
Valid	1 Poorest	7273	25.6
	2 Poorer	6628	23.4
	3 Middle	5736	20.2
	4 Richer	4777	16.8
	5 Richest	3947	13.9
	Total	28361	100.0

Table 2

Source of Drinking Water

	N	%
Piped into dwelling	467	1.6%
Piped to yard/plot	496	1.7%
Piped to neighbor	157	0.6%
Public tap/standpipe	1943	6.9%
Tube well or borehole	9574	33.8%
Protected well	2855	10.1%
Unprotected well	6110	21.5%
Protected spring	170	0.6%
Unprotected spring	513	1.8%
River/dam/lake/ponds/stream/canal/irrigation channel	3209	11.3%
Rainwater	458	1.6%
Tanker truck	182	0.6%
Cart with small tank	725	2.6%
Bottled water	89	0.3%
Sachet water	1301	4.6%
Other	52	0.2%
Not a dejure resident	60	0.2%

Table 3

Type of Toilet Facility

	N	%
Flush to piped sewer system	686	2.4%
Flush to septic tank	2685	9.5%
Flush to pit latrine	1665	5.9%
Flush to somewhere else	225	0.8%
Flush, don't know where	16	0.1%
Ventilated Improved Pit latrine (VIP)	1110	3.9%
Pit latrine with slab	7460	26.3%
Pit latrine without slab/open pit	7007	24.7%
No facility/bush/field	7182	25.3%
Composting toilet	23	0.1%
Bucket toilet	25	0.1%
Hanging toilet/latrine	205	0.7%
Other	12	0.0%
Not a dejure resident	60	0.2%

Table 4

Household Has: Motorcycle/scooter

	N	%
No	17482	61.6%
Yes	10819	38.1%
Not a dejure resident	60	0.2%

Table 5

Household Has: Electricity

	N	%
No	14801	52.2%
Yes	13500	47.6%
Not a dejure resident	60	0.2%

Table 6

Household Has: Radio

	N	%
No	12379	43.6%
Yes	15922	56.1%
Not a dejure resident	60	0.2%

Table 7

Household Has: Television

	N	%
No	16767	59.1%
Yes	11534	40.7%
Not a dejure resident	60	0.2%

Table 8

Household Has: Bicycle

	N	%
No	23638	83.3%
Yes	4663	16.4%
Not a dejure resident	60	0.2%

Table 9

Household Has: Refrigerator

	N	%
No	23553	83.0%
Yes	4748	16.7%
Not a dejure resident	60	0.2%

Table 10

Household Has: Car/Truck

	N	%
No	25621	90.3%
Yes	2680	9.4%
Not a dejure resident	60	0.2%

Table 21

Main Floor Material

	N	%
Earth/sand	10094	35.6%
Dung	98	0.3%
Wood planks	38	0.1%
Palm/bamboo	17	0.1%
Parquet or polished wood	47	0.2%
Vinyl or asphalt strips	3	0.0%
Ceramic tiles	1744	6.1%
Cement	15230	53.7%
Carpet	999	3.5%
Other	31	0.1%
Not a dejure resident	60	0.2%

Table 12

Main Wall Material

	N	%
No walls	1207	4.3%
Cane/palm/trunks	1499	5.3%
Dirt	823	2.9%
Bamboo with mud	3374	11.9%
Stone with mud	4944	17.4%
Uncovered adobe	341	1.2%
Plywood	35	0.1%
Reused wood	24	0.1%
Cement	10403	36.7%
Stone with lime/cement	66	0.2%
Bricks	848	3.0%
Cement blocks	4504	15.9%
Covered adobe	10	0.0%
Wood planks/shingles	106	0.4%
Other	117	0.4%

Table 33

Main Roof Material

	N	%
No roof	36	0.1%
Thatch/palm leaf	3113	11.0%
Mud	427	1.5%
Rustic mat	295	1.0%
Palm/bamboo	456	1.6%
Wood planks	30	0.1%
Cardboard	2	0.0%
Metal/zinc	22712	80.1%
Wood	176	0.6%
Calamine/cement fiber	168	0.6%
Ceramic tiles	36	0.1%
Cement	245	0.9%
Roofing shingles	484	1.7%
Other	121	0.4%
Not a dejure resident	60	0.2%

Research Questions

RQ1: Is there an association between religious affiliation and infant mortality rates in the six regions of Nigeria (North Central, North East, North West, South East, South-South, and South West) among women while controlling for age, education, and wealth index?

H_o1 - There is no association between religious affiliation and infant mortality rates in the six regions of Nigeria (North Central, North East, North West, South East,

South-South, and South West) among women while controlling for age, education, and wealth index.

HA1 - There is an association between religious affiliation and infant mortality rates in the six regions of Nigeria (North Central, North East, North West, South East, South-South, and South West) among women while controlling for age, education, and wealth index.

RQ2: Is there an association between marital status and infant mortality rates in the six regions of Nigeria (North Central, North East, North West, South East, South-South, and South West) among Muslim women while controlling for age, education, and wealth index?

H_o1 - There is no association between marital status and infant mortality rates in the six regions of Nigeria (North Central, North East, North West, South East, South-South, and South West) among Muslim women while controlling for age, education, and wealth index.

HA1 - There is an association between marital status and infant mortality rates in the six regions of Nigeria (North Central, North East, North West, South East, South-South, and South West) among Muslim women while controlling for age, education, and wealth index.

RQ3: What is the association between gender and infant mortality rates in the six regions of Nigeria (North Central, North East, North West, South East, South-South, and South West) among Muslim wives while controlling for age, education, and wealth index?

H_o1 - There is no association between gender and infant mortality rates in the six regions of Nigeria (North Central, North East, North West, South East, South-South, and South West) among Muslim wives while controlling for age, education, and wealth index.

HA1 - There is an association between gender and infant mortality rates in the six regions of Nigeria (North Central, North East, North West, South East, South-South, and South West) among Muslim wives while controlling for age, education, and wealth index.

Limitations

Some of the limitations of this study include the use of secondary data and participant self-report. The data collected was not used to answer my specific research questions without involvement in the research design and instrument selection. For example, the relationship to the head of the household variable does not provide information on marriages, such as the number of wives associated with the head of household. Another potential barrier was the self-reported survey, which could result in biased results.

Significance

This study is significant because, to my knowledge, research on the influence of gender inequality among Islamic religious affiliation and female infant mortality rates is limited. The study's significance is that it may better understand the types of support Muslim wives need to increase their infant daughter's survival rate. This study may contribute to public health by providing evidence on the factors contributing to infant

mortality among females in regions across Nigeria where the Islamic religion is practiced. Findings from this may foster the development of culturally appropriate interventions to meet the Muslim community's specific needs. Strategies could be identified to reduce further deaths through increased knowledge about the risks associated with female infant mortalities. Although current interventions do not include gender-specific discharge instructions, future interventions could include such information to host open discussions regarding the challenges in caring for a female infant in areas that practice the Islamic religion across Nigeria.

This study's social change implications for health educators and providers may include collaborating with communities and state and government organizations to develop female infant mortality prevention interventions that prioritize Muslim wives. The intervention could consist of the support of family, friends, and religious leaders to create accountability for female infants' survival from birth to their first birthday. Health policy planners may also utilize the study findings to conduct health promotion campaigns via the hospital and birthing centers targeting Muslim women, which may improve infant-related health outcomes

Literature Review

This section examined previously written works on infant mortality rates, Muslim culture, and religious affiliation across the six regions of Nigeria, which provided evidence-based research to support the identified gap in the research. The literature review demonstrated how the gap in the literature was essential to current health care issues regarding infant mortality rates in Nigeria and how gender plays a role in their

survival. This section includes an overview of how the literature review was conducted, the theoretical framework, and supportive findings related to infant mortality, gender inequality, health disparities, and the social-economic status of Nigerian wives who practice Islamic religious practices.

Literature Search Strategy

Google Scholar, Thoreau, CINAHL, ScienceDirect, SocINDEX, MEDLINE, Education Source, and Directory of Open Access Journals were used to identify previously written research using the following key words: *infant mortality rates*, *gender inequality in Nigeria*, *religion*, *Muslim culture*, *Islamic religious practices in Nigeria*, and *inequality in healthcare*. Many articles identified were written within the last five years, from 2016 to 2021. Literature regarding the theoretical framework was written before the five-year review period, which provides substantial evidence of SEM and how it affects health outcomes for populations with high disparities and low social-economic status when influenced by marital status, education, and income. Urie Bronfenbrenner created the SEM in 1974; therefore, all pertinent information regarding the use of the SEM was conducted with previously written works before 2016. Many of the articles identified throughout this literature review were found using the databases associated with the Walden University library system. The databases used for this literature review include Thoreau, CINAHL, ScienceDirect, SocINDEX, MEDLINE, Education Source, and Directory of Open Access Journals. The critical terms for the literature review were gender inequality, Nigeria, religion, Islam, and infant mortality rates. Throughout the study of previously written literature, quantitative research was used to ensure the

credibility of the results and the trustworthiness of the information provided by statistical analysis performed by previous research. Because the current research was conducted using quantitative analysis, it only made sense to use such information to ensure that the articles support the information in the doctoral study. The literature review contains articles from peer-reviewed sources and journals, accessible electronically and written in English.

Literature Review Related to Key Variables and Concepts

Sociodemographic, Social, Economic, and Cultural Factors

Income, education, and age are known factors determining health status and quality of life in developing countries such as Nigeria. In a country where many women choose to give birth at home rather than in healthcare facilities, pregnancy complications and infant mortality increase with birth, especially in low socioeconomic statuses such as access to quality health care, income, and limited education. Bolu-Steve et al. (2020) said cultural beliefs regarding infant mortalities among employed mothers in Nigeria. Bolu-Steve et al. (2020) said that cultural beliefs varied according to socioeconomic status (age, education, and income). Many expecting mothers were more prone to cultural beliefs regarding infant mortalities than the medical expertise that could have prevented infant deaths in Nigeria (Bolu-Steve et al., 2020). Undelikwo et al. (2018) said cultural practices lead to infant mortalities in Cross River State, Nigeria. Undelikwo et al. (2018) found that most of those participating in such practices were superstitious and relied on traditions as opposed to modern medicine; areas such as this have the highest infant mortality rates. The findings in this research demonstrate the prevalence of tradition and

cultural beliefs in Nigeria and how it impacts infant mortality, according to Undelikwo et al. (2018). Askeer et al. (2018) said the factors that contributed to the lack of improvements in the overall health of mothers and infants in Muslim-majority countries (MMCs).

Poor health and child mortality in MMCs were related to government oversite, conflict in the land, and lack of empowerment among women (Askeer et al., 2018). Kotsadam et al. (2018) examined how government aid affects health outcomes in Nigeria and found that infant mortalities were decreased for families in areas that receive assistance from the government. However, the areas were always the same. They did not branch out to areas with high infant mortality, suggesting bias associated with the type of assistance provided in Muslim-dominated areas. Muslim populations practicing Islam could not access help to prevent infant mortalities (Kotsadam et al., 2018). Brinda et al. (2015) examined the relationship between gender inequalities in low-income countries and the mortality rates of infants and children under five. Brinda et al. (2015) said that gender inequalities were more prevalent in low to middle-income countries, and future interventions should be created to empower women and decrease child mortality rates. Thus, demonstrating the importance of women's empowerment and how the lack of education among women was associated with increased child mortality rates (Brinda et al., 2015). Iqbal et al. (2018) examined the relationship between gender inequality and the mortality sex ratio of children in 195 countries worldwide; and found those female children were more likely to die in countries that were gender discriminated. While this article did not include a statistical analysis of Nigeria, the information concluded that

gender inequality contributes to death among females in male-dominated societies (Iqbal et al., 2018). Uddin et al. (2021) examined gender inequalities and how they related to infants' survival post-discharge after birth. Uddin et al. (2021) said that the gender of the infant, caregiver, and medical care provider played a significant role in the adherence to post-discharge instructions, seeking future treatment and recovery for sickly infants, and families were willing to spend more income and time to ensure the health of the male child. Gender inequalities associated with the survival of infants and gender discrimination can contribute to infant mortality rates in low-income countries (Uddin et al., (2021). Ushie et al. (2019) examined the inequalities associated with a cesarean section for expecting mothers in Nigeria and found that cesarean sections were offered to women of higher income status rather than women who could benefit from the life-saving intervention related to pregnancy complications. As noted, the findings support the inequalities associated with healthcare decisions for pregnant women in Nigeria as it contributes to infant mortality (Ushie et al., 2019).

Definitions of Terms

Gender Inequality: Gender inequality, also referred to as gender discrimination, occurs when people of different genders (i.e., male and female) are not treated equally based on gender (Kolb, 2008).

Infant Mortality Rates: Number of deaths of infants per 1,000 live births (CDC, 2020).

Islam: Islam means to submit to the will of God; those who follow the rules and guidelines are known as Muslims. Islam is the religious belief of Allah and Muhammad

as his prophet (Merriam-Webster, n.d.). Islamic religious obligations believe in God and his prophet, prayer, giving, pilgrimage, and fasting (Encyclopedia Britannica, 2021a).

Muslim: people who follow and practice Islam's religious belief (submit to God's will; Merriam-Webster, n.d.).

Key Variables

Age: a continuous variable defined by women aged 15 to 49 who were married and resided in one of the six regions across Nigeria participating in the 2018 Nigeria Demographic and Health Survey.

Age at Infant Death: a continuous variable defined by the age an infant died, as provided by the wife during her answers to the 2018 Nigeria Demographic and Health Survey.

Education: a categorical variable that provided the highest level of education obtained by participants from the 2018 Nigeria Demographic and Health Survey. Education categories were defined as 1) no education, 2) Primary, 3)Secondary, and Higher. In addition, the study reviewed the answers provided by wives; thus, the education variable indicated their highest educational attainment.

Regions: a categorical variable representing the six Nigeria regions. The survey respondents resided in one of the six regions while participating in the 2018 Nigeria Demographic and Health Survey. The six regions of Nigeria are North Central, North East, North West, South East, South South, and South West Nigeria.

Relationship to Head of Household: a categorical variable that defined the relationship the survey participant provided when establishing their ties to the head of

household. Participants of the 2018 Nigeria Demographic and Health Survey provided their relationship as the head, wife, daughter-in-law, granddaughter, mother-in-law, sister, co-spouse, other relatives, adopted/foster child, not related, a niece by blood, niece by marriage, or co-wife. However, this study was only interested in wives, where *N*=28,361 or 83.6% of the answers were provided by the respondents of the 2018 Nigeria Demographic and Health Survey.

Religion: a categorical variable that demonstrated the respondents' religious affiliation when providing answers to the 2018 Nigeria Demographic and Health Survey. The religion categories were Catholic, Other Christian, Islam, Traditionalist, and Other, where Islam was the most frequent religious affiliation of respondents recorded on the 2018 Nigeria Demographic and Health Survey.

Sex of Child: a categorical variable defined as male or female at birth.

Wealth Index: a categorical variable that defined the respondents' wealth when answering the 2018 Nigeria Demographic and Health Survey. The categories of the wealth index include Poorest, Poorer, Middle, Richer, and Richest. According to the World Bank (2019), the wealth index was defined as:

> Household scores are based on the number and kinds of consumer goods they own, ranging from a television to a bicycle or car, and housing characteristics such as a source of drinking water, toilet facilities, and flooring materials. These scores were derived using … the household score of each usual (de jure) household member, ranking each person in the household population by their

> score, and then dividing the distribution into five equal categories (Poorest, Poorer, Middle Richer, Richest), each comprising 20% of the population. (p.15)

Summary and Conclusion

Health disparities among populations in developing and low-income countries are prevalent and lead to a shortening life span for infants needing medical attention. The problem involves cultural and religious aspects in terms of how people deem which gender receives special attention when reviewing the survival outcomes of infants. Parents of male children born in male-dominated societies are often spared from paying for medical expenses (Uddin et al., 2021). This study used SEM to describe how gender inequality affects the infant mortality rates of female babies of Muslim wives residing in Nigeria.

Section 2: Research Design and Data Collection

The purpose of this quantitative study was to examine if location or region of residence in Nigeria and Islamic religious affiliation are associated with female infant mortality rates among Muslim wives after adjusting for age, education, and wealth index. Gender inequality is prevalent throughout society and plays a significant role in healthcare. Brinda et al. (2015) said females residing in low-income and poverty areas were subjected to gender inequality. Female children were more likely to die because of gender inequality than male children (Iqbal et al., 2018). Islamic religious leaders in Israel have demonstrated concerns about infant mortality rates in their culture; they were willing to advocate for communities to reduce infant mortality rates among Muslim people (Cohen-Dar et al., 2017). Parents were willing to spend more time and resources to ensure better health outcomes for male-born children (Uddin et al., 2021). This research evaluated whether there were associations between female infant mortality rates and Islamic religious affiliation among Muslim wives across the six regions of Nigeria. I examined explicitly whether gender inequalities were found and whether females were more likely to die before they reached age 1. I examined whether there were differences between the six regions across Nigeria and how they may be impacted by religious affiliation and gender inequality among Muslim wives living in this country. There was a lack of literature regarding associations between Islamic religious affiliation and female infant mortality rates for babies born to Muslim wives across the six regions of Nigeria.

Research Design and Rationale

I evaluated secondary data collected from the 2018 Nigeria Demographic and Health Survey. The 2018 Nigeria Demographic and Health Survey was performed to collectively provide information on the health and demographic status of people residing in the country of Nigeria. The survey includes up-to-date information regarding household status (wealth indicators), birth information (pregnancy, live births, and deaths), and health information (health diagnoses and sexual/reproductive health) of all members of a household. The Survey was conducted in 2018 across the six regions of Nigeria. Data collection began on August 14, 2018, and concluded on December 29, 2018.

This quantitative study involved using a correlational research design and analyzing multiple variables in terms of their effect on the dependent variable. Religious affiliation was the independent predictor variable used to identify if a relationship exists between infant mortality rates and the dependent variable. The region variable was classified as six regions in Nigeria; this was examined as a meditating variable. Sex of child was used as a moderating variable to demonstrate increases in infant mortality rates among either gender.

Correlational research designs are used for quantitative research studies when researchers identify whether a relationship or association exists between variables (Burkholder et al., 2016). Multiple regression was used when there was more than one independent predictor variable (Burkholder et al., 2016). Multiple regression was used to demonstrate whether a relationship exists between variables while controlling for age,

education, and wealth index. In addition, I showed if changes occurred in terms of relationships between independent and dependent variables while examining covariate, mediating, and moderating variables.

I examined whether there were associations between two or more variables, and I used multiple regression with a correlational design method for this quantitative study. No time or resource restraints were foreseen with this study, as I used secondary data from a health survey performed in 2018. Some of this study's limitations involve using secondary data and participant self-reporting. Another potential barrier was the self-reported survey, which could lead to biased results. Overall, multiple regression involves examining data and demonstrating whether an association exists. I obtained information to explore relationships involving associations between infant mortality rates and religious group affiliations across Nigeria.

Methodology

Population

The household demographic questionnaire was the primary focus of this study. The survey included data from all household members and women between 15 and 49, as well as children between 0 and 5 who are also residents in the household (The World Bank, 2019, p.4). “A total of 41,668 households were selected for the sample, of which 40,666 were occupied. Of the occupied households, 40,427 were successfully interviewed, yielding a response rate of 99%. In the households interviewed, 42,121 women age15-49 were identified for individual interviews; interviews were completed with 41,821 women, yielding a response rate of 99%” (p.5). Further analysis of the target

population in relation to the head of the household of wives concluded with a study population where *N*=28,361 or 83.6% of the answers provided by the respondents of the 2018 Nigeria Demographic and Health Survey.

Sampling Procedures

According to The World Bank (2019), the original concept for the data captured in the survey was conducted in 2006 by the National Population Commission (NPC). Data were generated and created in the Population and Housing Census of the Federal Republic of Nigeria (PHCFRN). Nigeria is divided into states and local government areas (LGAs). There were 774 LGAs that provided information for the census, which was later used for the 2018 Nigeria Demographic Health Survey. Sampling for the 2018 survey was conducted using stratification in which states were further broken down to obtain 74 samples (The World Bank, 2019).

Secondary Data

The 2018 Nigeria Demographic and Health Survey data were used for analysis. The household demographic questionnaire was the primary focus of this research study. Access to the data was obtained through the Demographic and Health Surveys Program via their website. To receive approval, I registered on the website. In addition, I provided a tentative title for the research and a description summarizing how data from the 2018 Nigeria Demographic and Health Survey were used and the type of analysis to be performed. This information was submitted for review, and approval to use data was granted based on preliminary information.

Quality of Secondary Data

As data collection was completed in each cluster, all electronic data files were transferred via the IFSS to the NPC central office in Abuja. These data files were registered and checked for inconsistencies, incompleteness, and outliers. The field teams were alerted to any discrepancies and errors. Secondary editing, carried out in the central office, involved resolving inconsistencies and coding the open-ended questions. The NPC data processor coordinated the exercise at the main office. The biomarker paper questionnaires were compared with electronic data files to check for any inconsistencies in data entry. Data entry and editing were carried out using the CSPro software package. The concurrent processing of the data offered a distinct advantage because it maximized the likelihood of the data being error-free and accurate. Timely generation of field check tables allowed for effective monitoring. The secondary data editing was completed in the second week of April 2019. (The World Bank, 2019, p.8).

The information provided by this dataset was pertinent in providing statistical analysis to understanding the association of religious affiliations and gender-specific mortality rates across the six regions of Nigeria. The dataset comprises four questionnaire surveys that focus on the issues regarding health and the analyzed data people of Nigeria (The World Bank, 2019). In addition, this doctoral research study analyzed household survey data, which contained all relevant variables.

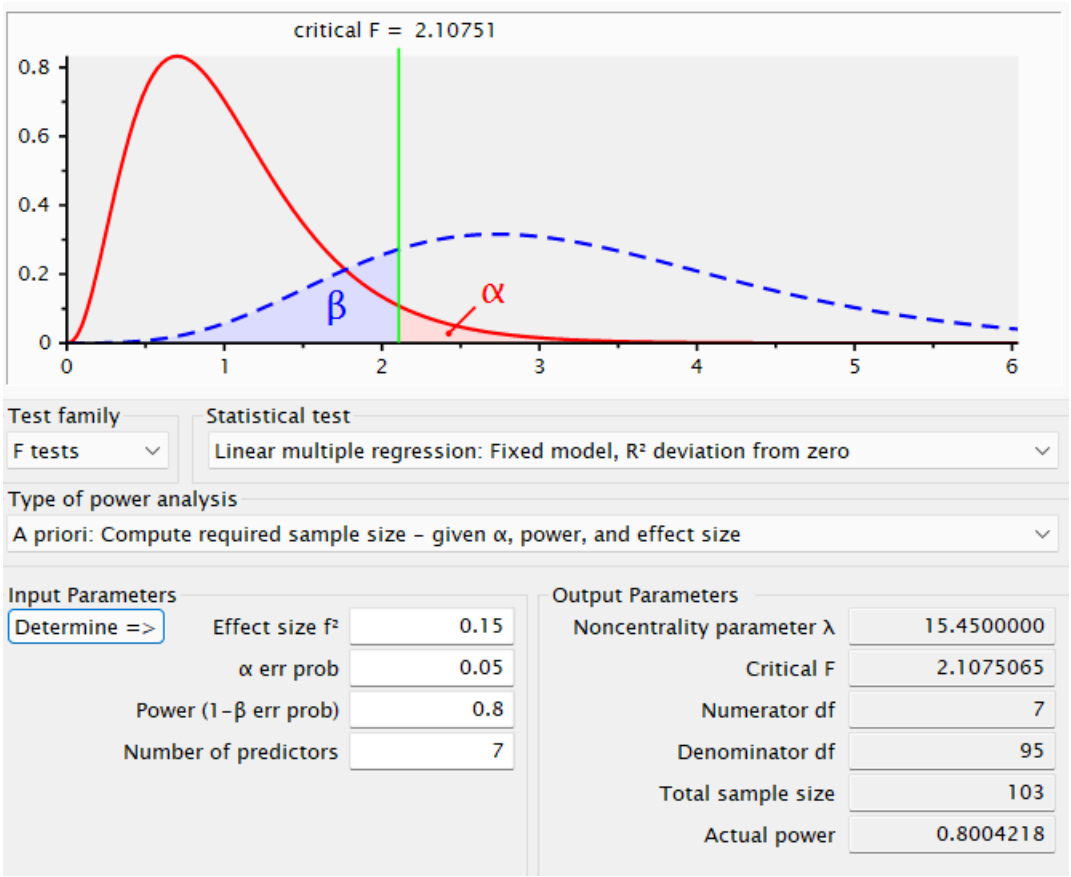
Power Analysis

The power analysis was conducted using G*Power software. G*Power is a computer program used to calculate the statistical power and effect sizes for different

tests (Faul et al., 2009). Figure 3 displays the output used to calculate the sample size for the doctoral study. The minimum sample size needed to detect the change was 95. The G*Power software figured a total sample size of 95; this was the minimal sample that could be used to see a difference for the statistical test with the parameter of effect size equaling 0.15 medium, α at 0.05, power at 0.80, and several predictors equaling seven (i.e., previously discussed variables). An effect size aided in understanding the relationship between two variables. The larger the effect size, the stronger the relationship (McLeod, 2019). The higher confidence level and power suggest an increase in sample size. Increased power level decreases the likelihood of making a type II error; therefore, there was an 80% chance of not making a type II error. A significance level of 0.05 means a 5% chance that the observed results were false and made in error; however, there was a 95% chance that the empirical results were accurate and not made in error. By selecting a significance level of 0.05, the study limits the probability of making an error with the observed results. With a population of N=28,361, the doctoral research has a large enough sample size to conduct statistical analysis.

Figure 3.

*G*Power sample size estimation*



Instrumentation and Operationalization of Constructs

IBM Statistical Package for the Social Sciences (SPSS) software version 27 was used to analyze data for the research study.

Research Questions

RQ1: Is there an association between religious affiliation and infant mortality rates in the six regions of Nigeria among Muslim women while controlling for age, education, and wealth index?

RQ2: Is there an association between marital status and infant mortality rates in the six regions of Nigeria among Muslim women while controlling for age, education, and wealth index?

RQ3: Is there an association between gender and infant mortality rates in the six regions of Nigeria among Muslim wives while controlling for age, education, and wealth index?

Detailed Data Analysis Plan

A multiple regression statistical test was used to test the correlation of variables. The assumptions of linearity, reliability of measurement, and normality were explained during the data analysis. Testing for assumptions included evaluating the data distribution to see if the data were normally distributed (normality). In addition, reliability was tested using Pearson's correlation coefficient. Alternative *F* statistics determined statistical significance in cases where the assumptions were violated. Bonferroni correction tests decrease the probability of a type 1 error occurring during the statistical analysis of multiple data. Using covariate variables such as age, education, and wealth index demonstrated whether an association between religious affiliations and infant mortality rates (age at child death) existed, further identifying the variability of the statistical significance. The results were interpreted using statistical analysis performed through inferential statistics using a confidence interval of 95% with an alpha level of 0.05, which determined the statistical significance of the dataset used in this research study.

Threats to Validity

External Validity

External validity occurs when the study results can be generalized to various settings other than the findings demonstrated by the research (Burkholder et al., 2016). Threats to external validity may occur as sampling bias, whereas the sample group does not represent the population. For example, the sample population evaluates married women; however, the research analysis evaluated the infant mortality rate among married women of various religious affiliations across Nigeria. To decrease the threat of external validity, the study included probability sampling to ensure that all married women have an equal chance of being selected for the data analysis.

Internal Validity

Threats to internal validity can consist of ambiguous temporal precedence in which the relationship between variables cannot be concluded (Shadish, et al., 2002). According to Shadish et al.(2002), ambiguous temporal precedence occurs when a researcher cannot identify which variable occurred first, thus threatening the relationship of association (i.e., cause and effect). To limit this threat, the data were analyzed (filtered) by using the connection to the head of household (i.e., wife) to ensure that any answers regarding an infant's death occurred while married to eliminate such internal threats. In addition, controlling for age, education, and wealth index during the statistical analysis prevented further threats to the internal validity. Burkholder et al. (2016) said," controlling for differences between groups before introducing the independent variable …minimizes any potential confounds that could affect the observed outcome" (p. 57).

Ethical Procedures

The sample for the 2018 NDHS was a stratified sample selected in two stages. Stratification was achieved by separating the 36 states and the Federal Capital Territory into urban and rural areas. In total, 74 sampling strata were identified. Samples were selected independently in every stratum via a two-stage selection. Implicit stratifications were achieved at the lower administrative levels by sorting the sampling frame before sample selection according to administrative order and using a probability proportional to size selection during the first sampling stage. (The World Bank, 2019, p.5).

Subject identifiers were not used in the 2018 Nigeria Demographic and Health Survey dataset. Further use of data is only available through access granted by the DHS program. Therefore, additional research using this dataset would require an access request and approval through the DHS program's website. There were no further concerns about the data being used outside of its intended purpose other than the research for this doctoral study.

Summary

Using a quantitative method with a correlational design aligns with the research questions of this doctoral study. Statistical assessments examining the relationships between two or more variables were more frequently addressed using multiple regression models. The use of secondary data was beneficial to researchers, whereas primary research was not accessible. The information in this section was used to address results and findings as well as applications to professional practice and implications for social change of this doctoral study.

Section 3: Presentation of the Results and Findings

The purpose of this quantitative study was to examine if any of the six regions of Nigeria and Islamic religious affiliation influence female infant mortality rates among Muslim wives after adjusting for age, education, and wealth index. The 2018 Nigeria Demographic and Health Survey was conducted in 2018 across the six regions of Nigeria. Data collection began on August 14, 2018, and concluded on December 29, 2018 (The World Bank, 2019). There were four questionnaires used to collect information for the 2018 NDH survey. The questionnaires included the Household Questionnaire, the Woman's Questionnaire, Man's Questionnaire, and the Biomarker Questionnaire. The questionnaires, based on The DHS Program's standard Demographic and Health Survey (DHS-7) questionnaires, were adapted to reflect the population and health issues relevant to Nigeria" (p.7). The household demographic questionnaire was the primary focus of this research study. This study had a population of N = 28,361, or 83.6% of respondents to the 2018 Nigeria Demographic and Health Survey.

RQ1

RQ1: Is there an association between religious affiliation and infant mortality rates in the six regions of Nigeria among Muslim women while controlling for age, education, and wealth index?

A multiple regression analysis was conducted to evaluate age at death and its relationship with religious affiliation, where N = 28,361. After filtering this population for those who lost a child, the total population decreased to N = 2,765 (9.7% of the total population recorded losing a child during survey completion). Results of the multiple

regression revealed that there was a statistically significant ($p < 0.05$) association between religious affiliation and infant mortality rates in the six regions of Nigeria among women (see Table 14). However, when controlling for age, education, and wealth index, religious affiliation does not influence infant mortality, with $p > 0.05$ (See Table 15). Thus, I was unable to reject the null hypothesis. Table 16 demonstrates a breakdown of religious groups who participated in the 2018 Nigerian Demographic and Health Survey; results show Pearson's correlation, and there was an association between age at death and being a wife ($p = 0.149$), as opposed to other religious affiliations (i.e., Christianity, Catholicism, and traditionalist) with all other p values below zero.

Table 14

RQ1 Model Summary[b]

R	R Square	F Change	df1	df2	Sig. F Change	Durbin-Watson
.151[a]	0.023	16.075	4	2760	0	1.829

a. Predictors: (Constant), Traditionalist, Catholic, Christian, Islam

b. Dependent Variable: Age at Death

Table 15

RQ1 Coefficients[a] *with Controls*

	B	Sig.	VIF
(Constant)	172.367	0	
Religion	0.339	0.657	1.01
Age	0.665	0.013	1.008
Education	-17.887	0	1.642
Wealth Index	-12.379	0	1.642

a. Dependent Variable: Age at Death

Table 16

RQ1 Pearson Correlations (N=2765)

	1	2	3	4
1. Age at Death	-			
2. Catholic	-.073**	-		
3. Christian	-.122**	-.101**	-	
4. Islam	.149**	-.369**	-0.881	-
5. Traditionalist	-0.016	-0.008	-0.019	-.068**

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed)

According to Table 14, $R = 0.151$, which is closer to 0, which indicates that age at death and religious affiliation were not correlated, and no linear relationship exists between them). Pearson's correlation value of 0.023 suggests that religious affiliation accounts for 2.3% of the variation in age at death, which means that 97.7% of the variation in age at death cannot be explained by religious affiliation alone.

As noted in Table 14, the value for the Durbin-Watson statistic was 1.829, thus demonstrating a positive correlation between religion and the infant mortality rate. However, no significant associations were found between dependent and independent variables when addressing covariate variables age, education, and wealth index.

Table 17 involves whether the model was a significant predictor of the outcome variable. This was tested using analysis of variance (ANOVA). With a significance value of $p < 0.05$, ANOVA statistically significantly predicts age at death. Results indicated

that the model was a significant predictor of infant mortality, with F (4,2760) =16.075 and p = 0.000.

Table 17

RQ1 ANOVA[a]

	df	F	Sig.
Regression	4	16.075	.000[b]
Residual	2760		
Total	2764		

a. Dependent Variable: Age at Death

b. Predictors: (Constant), Traditionalist, Catholic, Christian, Islam

Table 18 shows religious groups and whether they significantly contributed to the multiple regression model. All p values were >0.05, indicating that none of the religious groups alone contributed to the significance of the model. A variance inflation factor (VIF) of one for the given independent variable indicates the total absence of collinearity between religion and other predictors in the model. Table 15 demonstrates religious group affiliation while controlling for age (p = 0.13), education (p = 0.00), and wealth index (p = 0.00). In the overall model, respondents' age, education, and wealth index provided significance to the regression model compared to religion's association with age at death. Therefore, as respondents' age increased by one unit, the age at death increased by 0.665. As education attainment increased by one unit, the age at death decreased by 17.887. As the wealth index increased by one unit, age at death decreased by 12.379 units.

Age at Death = 172.367 + (0.339*Religion) + (0.665*Age) + (-17.887*Education) + (-12.379*Wealth Index).

Table 18

RQ1 Coefficients[a]

	B	Sig.	VIF
(Constant)	156	0.036	
Catholic	-41.357	0.581	54.691
Christian	-29.856	0.688	216.854
Islam	5.442	0.942	249.892
Traditionalist	-48.5	0.594	2.996

a. Dependent Variable: Age at Death

A multiple regression analysis was conducted to investigate whether religious affiliation could significantly predict infant mortality rates (i.e., age at death). The results of the multiple regression indicated that the model explained 2.3% of the variance and that the regression model was a significant predictor of infant mortality F (4,2760) =16.075, p = 0.000. While respondent's age, education and wealth index contributed significantly to the model (B_2= 0.665, $p < 0.05$), (B_3= -17.887, $p < 0.05$), (B_4= -12.379, $p < 0.05$), Religion did not (B_1= 0.339, p=0.657). Thus, there is no association between religious affiliation and infant mortality rates in the six regions of Nigeria among women while controlling for age, education, and wealth index.

The final predictive model was: Infant Mortality Rate = 172.367 + (0.339*Religion) + (0.665*Age) + (-17.887*Education) + (-12.379*Wealth Index).

RQ2

RQ2: Is there an association between marital status and infant mortality rates in the six regions of Nigeria among Muslim women while controlling for age, education, and wealth index?

A multiple regression analysis was conducted to evaluate the prediction of the age at death (infant mortality rate, i.e., dependent variable) from marital status (independent variable), where N=18,665. After filtering the population for those who lost a child, the total population decreased to N=2,111 (11.3% of the total population recorded losing a child during the survey completion). In Table 19, the results of the multiple regression revealed that there was a statistically significant (p= 0.036) association between marital status and infant mortality rates in the six regions of Nigeria (North Central, North East, North West, South East, South-South, and South West) among women. However, when controlling for age, education, and wealth index, marital status does not influence infant mortality with $p > 0.05$ (See Table 20). Thus, I was unable to reject the null hypothesis. Table 21 shows the marital statuses associated with the 2018 Nigerian Demographic and Health Survey. Of those who answered as a wife, the results given by this chart demonstrate Pearson's Correlation and that there was an association between age at death and being married (p = 0.040) and divorced (p = 0.17) for those affiliated with the Islamic religious group as opposed to widowed and never married, all other p values fell below zero.

Table 19

RQ2 Model Summary[b]

R	R Square	F Change	df1	df2	Sig. F Change	Durbin-Watson
.056[a]	0.003	3.34	2	2108	0.036	1.779

a. Predictors: (Constant), Divorced, Never Married

b. Dependent Variable: Age at Death

Table 20

RQ2 Coefficients[a] with Controls

	B	Sig.	VIF
(Constant)	171.077	0	
Marital Status	2.276	0.872	1.001
Age	0.709	0.021	1.006
Education	-17.948	0	1.412
Wealth Index	-12.753	0	1.406

a. Dependent Variable: Age at Death

Table 21

RQ2 Pearson Correlations (N=2111)

		Age at Death	Never Married	Married	Widowed	Divorced
Pearson Correlation	Age at Death	-				
	Never Married	-.054*	-			
	Married	.040*	-.886*	-		
	Widowed	.	.	.	-	.
	Divorced	0.017	-.003*	-.462**	.	-

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed)

According to Table 19, $R = 0.056$, which is closer to 0, which indicates that the age at death and marital status variables were not correlated (no linear relationship exists between them). The R^2 (Pearson's correlation) value of 0.003 associated with this regression model suggests that marital status accounts for 0.3% of the variation in age at death, which means that 99.7% of the variation in age at death cannot be explained by marital status alone.

As noted in Table 19, the value for the Durbin-Watson statistic was 1.779, thus demonstrating that a correlation is positive between marital status and the infant mortality rate. However, when adding the covariate variables (i.e., age, education, and wealth index), no significant associations were found among the dependent and independent variables.

Table 22 shows whether our model was a significant predictor of the outcome variable. This was tested using ANOVA. With the significance value of $p = 0.36$, I concluded that the regression model statistically significantly predicts age at death. The results indicated that the model was a significant predictor of infant mortality F (2,2108) =3.340, $p = 0.036$.

Table 22

RQ2 ANOVA[a]

	df	F	Sig.
Regression	2	3.340	.036[b]
Residual	2108		
Total	2110		

a. Dependent Variable: Age at Death
b. Predictors: (Constant), Divorced, Never Married

Table 23 shows the marital statuses and whether they significantly contributed to the multiple regression model. Let us note that never married (p = 0.014) and divorced (p = 0.014) were statistically significant, indicating that these two marital statuses contributed to the significance of the model. Widowers were excluded from the model, and those classified as married did not contribute significantly to the model. A variance inflation factor (VIF) of one for the given independent variable indicates the total absence of collinearity between marital status and other predictors in the model. Whereas Table 20, demonstrates the marital status while controlling for age (p=0.21), education (p=0.00), and wealth index (p=0.00). In the overall model, the respondent's age, education, and wealth index provided significance to the regression model compared to marital status in its association with age at death.

Therefore, as the respondent's age increased by one unit, the age at death increased by 0.709 units. As education attainment increased by one unit, age at death decreased by 17.948 units. Moreover, as the wealth index increased by one unit, the age at death decreased by 12.753 units. Age at Death = 171.077 +(2.276*Marital Status) + (0.709*Age) + (-17.948*Education) + (-12.753*Wealth Index).

Table 23

RQ2 Coefficients[a]

	B	Sig.	VIF
	161.782	0	
Never Married	-78.146	0.014	1
Divorced	47.218	0.436	1

a. Dependent Variable: Age at Death

Excluded Variables[a]

	Beta In	Sig.	VIF
Married	.[b]	.	-34776831099386.0

a. Dependent Variable: Age at Death

b. Predictors in the Model: (Constant), Divorced, Never Married

Multiple regression was conducted to investigate whether marital status could significantly predict infant mortality rates (i.e., age at death). The multiple regression indicated that the model explained 0.3% of the variance, and the regression model was a significant predictor of infant mortality F (2,2108) =3.340, p = 0.036. While respondent's age, education and wealth index contributed significantly to the model (B_2= 0.709, p < 0.05), (B_3= -17.948, p < 0.05), (B_4= -12.753, p < 0.05), Marital Status did not (B_1= 2.276, p = 0.872).

Thus, there is no association between marital status and infant mortality rates in the six regions of Nigeria (North Central, North East, North West, South East, South-South, and South West) among Muslim women while controlling for age, education, and wealth index. The final predictive model was: Infant Mortality Rate = 171.077 + (2.276*Marital Status) + (.709*Age) + (-17.948*Education) + (-12.753*Wealth Index).

RQ3

RQ3: Is there an association between gender and infant mortality rates in the six regions of Nigeria among Muslim wives while controlling for age, education, and wealth index?

A multiple regression analysis was conducted to evaluate the prediction of the age at death (infant mortality rate, i.e., dependent variable) from the sex of the child (independent variable), where N=18,665. After filtering the population for those who lost a child, the total population decreased to N=2,111 (11.3% of the total population recorded losing a child during the survey completion). In Table 24, the multiple regression results revealed a statistically significant (p= 0.038) association between the sex of the child and infant mortality rates in the six regions of Nigeria among women. Also, when controlling for age, education, and wealth index, there was found to be an association between the sex of the child and infant mortality with $p < 0.05$ (p = 0.152) (See Table 25).

Thus, the null hypothesis is rejected, and the alternative hypothesis is accepted. Table 26 displays the respondent's answers regarding the sex of the child at death associated with the 2018 Nigerian Demographic and Health Survey. Of those who answered as a wife, the results given by this chart demonstrate Pearson’s correlation and that there was an association between female children (p = 0.045) for those wives affiliated with the Islamic religious group as males were (p = -0.045).

Table 24

RQ3 Model Summary[b]

R	R Square	F Change	df1	df2	Sig. F Change	Durbin-Watson
.045[a]	0.002	4.291	1	2109	0.038	1.771

a. Predictors: (Constant), Female Child
b. Dependent Variable: Age at Death

Table 25

RQ3 Coefficients[a] *with Controls*

	B	Sig.	VIF
(Constant)	163.705	0	
Sex of child	6.402	0.152	1.005
Age	0.71	0.021	1.006
Education	-17.709	0	1.414
Wealth Index	-12.681	0	1.406

a. Dependent Variable: Age at Death

Table 26

RQ3 Pearson Correlations (N=2111)

		Age at Death	Male Child	Female Child
Pearson Correlation	Age at Death	-		
	Male Child	-.045*	-	
	Female Child	.045*	-1.000**	-

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed)

Table 24 indicates that the age at death and sex of child variables were not correlated (no linear relationship exists between them). The R^2 (Pearson's correlation) value of 0.002 associated with this regression model suggests that the sex of the child

accounts for 0.2% of the variation in age at death, which means that 99.8% of the variation in age at death cannot be explained by sex of child alone.

As noted in Table 24, the value for the Durbin-Watson statistic was 1.771, thus demonstrating that a correlation is positive between the sex of the child at death and the infant mortality rate. However, when adding the covariate variables (i.e., age, education, and wealth index), no significant associations were found among the dependent and independent variables.

Table 27 shows whether our model was a significant predictor of the outcome variable. This was tested using ANOVA. With the significance value of $p = 0.38$, the regression model predicts age at death statistically. The results indicated that the model was a significant predictor of infant mortality F (1,2109) =4.291, $p = 0.038$.

Table 27

RQ2 ANOVA[a]

	df	F	Sig.
Regression	1	4.291	.038[b]
Residual	2109		
Total	2110		

a. Dependent Variable: Age at Death
b. Predictors: (Constant), Female Child

Table 28 shows the sex of the child and whether they significantly contributed to the multiple regression model. Let us note that female children ($p = 0.038$) were statistically significant, which indicates that it contributed to the significance of the model. Male children were excluded as they did not contribute significantly to the model. A variance inflation factor (VIF) of one for the given independent variable indicates the

total absence of collinearity between marital status and other predictors in the model. Whereas Table 25, demonstrates the sex of child (p=0.152), while controlling for age (p=0.21), education (p=0.00), and wealth index (p=0.00). In the overall model, the sex of the child, the respondent's age, education, and wealth index provided significance to the regression model compared to age at death.

Therefore, for every female child conceived, the age at death increases by 6.402 units. As the respondent's age increased by one unit, the age at death increased by 0.710 units. As education attainment increased by one unit, age at death decreased by 17.709 units. Moreover, as the wealth index increased by one unit, the age at death decreased by 12.681 units. Age at Death = 160.705 + (6.402*Sex of child) + (0.710*Age) + (-17.709*Education) + (-12.681*Wealth Index).

Table 28

RQ3 Coefficients[a]

	B	Sig.	VIF
	156.971	0	
Female Child	9.485	0.038	1

a. Dependent Variable: Age at Death

Excluded Variables[a]

	Beta In	Sig.	VIF
Male Child	.[b]	.	.

a. Dependent Variable: Age at Death
b. Predictors in the Model: (Constant), Female Child

Multiple regression was conducted to investigate whether the sex of a child could significantly predict infant mortality rates (i.e., age at death). The regression model

results indicated that the model explained 0.2% of the variance and that the model was a significant predictor of infant mortality F (1,2109) = 4.291, p = 0.038. The model found that sex of child, respondent's age, education, and wealth index contributed significantly to the model sex of child (B_1= 6.402, p = 0.152) (B_2= 0.710, p = 0.21), (B_3= -17.709, p < 0.05), (B_4= -12.681, p < 0.05).

Thus, there is an association between gender and infant mortality rates in the six regions of Nigeria (North Central, North East, North West, South East, South-South, and South West) among Muslim wives while controlling for age, education, and wealth index. The final predictive model was: Infant Mortality Rate = 160.705 + (6.402*Sex of child) + (0.710*Age) + (-17.709*Education) + (-12.681*Wealth Index).

Summary

Data analysis in this study demonstrated associations between religious affiliation, marital status, sex of the child, and age of death for Muslim wives in Nigeria. Adding variables such as respondent age, education, and wealth index led to variations in data and limited statistical significance of findings. Multiple regression analysis demonstrated that gender-specific child mortality was a problem when evaluating a targeted population of Muslim wives. Also, Muslim women were found to have increased infant mortality rates among religious groups compared to other religious affiliations. In Section 4, I discuss how future healthcare practices should be geared toward religious groups such as Muslims in Nigeria.

Section 4: Application to Professional Practice and Implications for Social Change

The purpose of this quantitative study was to examine if the location or region of residence in Nigeria (North Central, North East, North West, South East, South South, and South West) and Islamic religious affiliation were associated with female infant mortality rates among Muslim wives after adjusting for age, education, and wealth index.

To answer RQ1, a multiple regression test was conducted to investigate whether religious affiliation could significantly predict infant mortality rates. Results of multiple regression indicated that the model explained 2.3% of the variance and was a significant predictor of infant mortality, with F (4,2760) =16.075 and $p = 0.000$. While respondents' age, education, and wealth index contributed significantly to the model ($B_2 = 0.665$, $p < 0.05$), ($B_3 = -17.887$, $p < 0.05$), ($B_4 = -12.379$, $p < 0.05$), religion did not ($B_1 = 0.339$, $p = 0.657$).

To answer RQ2, a multiple regression test was conducted to investigate whether marital status could significantly predict infant mortality rates. The multiple regression indicated that the model explained 0.3% of the variance, and the model was a significant predictor of infant mortality, with F (2,2108) =3.340 and $p = 0.036$. While respondents' age, education, and wealth index contributed significantly to the model ($B_2 = 0.709$, $p < 0.05$), ($B_3 = -17.948$, $p < 0.05$), ($B_4 = -12.753$, $p < 0.05$), marital status did not ($B_1 = 2.276$, $p = 0.872$).

To answer RQ3, a multiple regression test was conducted to investigate whether the sex of the child significantly predicted infant mortality rates. Regression model results indicated that the model explained 0.2% of the variance and was a significant

predictor of infant mortality, with F (1,2109) = 4.291 and p = 0.038. Sex of child, respondents' age, education, and wealth index contributed significantly to the model sex of child (B_1= 6.402, p = 0.152, B_2= 0.710, p = 0.21, B_3= -17.709, $p < 0.05$, B_4= -12.681, $p < 0.05$).

Interpretation of the Findings

Askeer et al. (2018) said poor health and child mortality in MMCs were related to government oversight, conflict in the land, and lack of empowerment among women. I concluded that religious affiliation contributed to infant mortality rates among women residing in the six regions of Nigeria. Bolu-Steve et al. (2020) said cultural beliefs vary according to socioeconomic status (age, education, and income). I concluded that respondents' age, education level, and wealth index were common factors that contributed to infant mortality rates among Muslim wives in Nigeria.

Uddin et al. (2021) said the gender of the infant, caregiver, and medical care provider played a significant role in adherence to post-discharge instructions, parents seeking future treatment, and recovery of sickly infants. Uddin et al. (2021) said families were willing to spend more money and time to ensure the health of the male child. There was a statistically significant correlation between gender and infant mortality rates among Muslim wives across Nigeria. Females born to Muslim wives were likelier to die than male infants who died before their first birthday.

Brinda et al. (2015) said gender inequalities were more prevalent in low to middle-income countries, and future interventions should empower women and decrease

child mortality rates. Brinda et al. (2015) said the lack of education among women was associated with increased child mortality rates.

Limitations of the Study

As previously discussed, the study's limitations included secondary data and participant self-reports. The data collected was not used to answer my specific research questions without involvement in the research design and instrument selection. The relationship to the head of the household variable does not provide information on marriages, such as the number of wives associated with the head of household. An additional potential barrier was the self-reported answers provided by respondents, which could have resulted in biased results. According to The World Bank (2019), to limit any errors in data collection and processing, the following methods were performed:
As data collection was completed in each cluster, all electronic data files were transferred via the internet filing streaming system (IFSS) to the NPC central office in Abuja. These data files were registered and checked for inconsistencies, incompleteness, and outliers. Field teams were alerted to any discrepancies and errors. Secondary editing, carried out in the central office, involved resolving inconsistencies and coding open-ended questions. The NPC data processor coordinated the exercise at the main office. Biomarker paper questionnaires were compared with electronic data files to check for any inconsistencies in data. Data entry and editing were carried out using CSPro. Concurrent data processing was advantageous because it maximized the likelihood of data being error-free and accurate. Timely generation of field check tables allowed for effective monitoring.

Secondary data editing was completed during the second week of April 2019. (The World Bank, 2019, p.8)

Recommendations for Further Research

Gender inequality is a global issue that impacts women and children in developing and developed countries. According to the statistical analysis performed in this doctoral study, marital status, religion, and gender were among the factors contributing to infant mortalities among women across the six regions of Nigeria. Future research would be beneficial in evaluating if there is an association between female infant mortality rates and religious affiliation in other countries where the Islamic religion is highly practiced. Understanding how religion plays a critical role in the health outcomes of pregnant Muslim wives could lead to a better healthcare plan to incorporate the best care practices to ensure infant survival after one year of birth. Future research needs to review the relationship between religion and medical care, create an innovative approach to address health concerns, and incorporate religious practices to ensure healthy outcomes for infant survival, especially for female infants.

Implications for Professional and Social Change

This doctoral study examined gender equality and its association with female infant mortality rates among Muslim wives in Nigeria. The statistical analysis used the results of 28,361 women who responded as wives and evaluated the association and statistical significance of the respondent's age, education, wealth index, marital status, religious affiliation, and sex of child against the infant mortality rate known as age at death. The study population was specific to those who resided across the six regions of

Nigeria, ranging from 15 to 49. The socioeconomic model was chosen for this doctoral study to demonstrate how varying factors influence health status from pregnancy to birth by identifying factors contributing to the relationships among oneself and others, the type of medical care provided during and after pregnancy, social and cultural norms, and community involvement. The following factors should be evaluated when implementing a religious-based approach on the intrapersonal level (age and education, financial burden or income, low decision-making autonomy, and a women's shyness/modesty to be seen by male physicians). Regarding the interpersonal level, efforts should be made when evaluating their family tradition, the husband's knowledge and perception, and the influence of family members and relatives. Finally, factors that need to be considered when creating healthy outcomes for infant survival include but are not limited to poverty, religious beliefs, traditional practices, and cultural/spiritual beliefs.

Implementing health care programs targeting religious groups would benefit those of the Muslim culture as they have increased infant mortalities than women of other religious affiliations. As noted previously, women residing in the southern regions of Nigeria were more accustomed to Western medicinal practices and the religious affiliations of Christianity (Babalola & Oyenubi, 2018). To increase survival outcomes for this population, healthcare options and support groups for religious affiliations would be best practices to improve awareness and health outcomes. Achieving such positive results would require critical stakeholders' collaborative approval, including religious leaders. The information provided by this doctoral study was one step in bringing awareness to the many factors that influence infant mortality. However, the data alone is

not enough to apply to practice and foresee that a change would occur overnight. Women residing in low socioeconomic countries have increased risks of infant mortalities.

Infant mortalities are increased among women with low education and limited income. Gender inequalities have been a global issue and have proven to affect the health outcomes of women and infants. This research aimed to identify whether female infant mortality rates increased in married Muslim women who reside in Northern Nigeria. Religious affiliations, marital status, the sex of a child, the mother's age, education level, and wealth have been proven to affect the infant mortality rate. Therefore, stakeholders should turn their attention to such factors and focus efforts on improving survival for children beyond one year according to religious affiliations and practices.

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