Available online at
http://journal.uitm.edu.my/ojs/index.php/jipsf

e-ISSN: 2590-3942

Journal of Islamic Philanthropy & Social Finance 8(1) 2026, 71-90

Journal of Islamic Philanthropy & Social Finance

# Predictors of Islamic financial inclusion in the Northwest Nigeria: further evidence

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ARTICLE INFO

*Article history:*
Received:
31 January 2026
Revised:
01 February 2026
Accepted:
06 March 2026
Published:
10 March 2026

*Keywords:*
Financial inclusion,
Islamic finance,
logistic regression,
Request for Financing

*DOI:*
doi.org/10.24191/gmvyhn72

ABSTRACT

This paper investigates the determinants of Islamic financial inclusion in the Northwest Nigeria which composed of seven (7) states. Guided by existing evidence in the literature, the paper uses four measures of financial inclusion as constructs: owning an account with Islamic bank, request for financing from an Islamic bank, owning an ATM and frequency of the usage of ATM card of an Islamic bank. Accordingly, it employs four logistic regression models to investigate how socioeconomic, demographic, demand and supply variables affect the research constructs in the study area using cross-sectional survey data of 800 households in the study area. Results show that gender, size of the household, years of business experience and distance of banks, impact significantly on the likelihood of having an Islamic bank account. Specifically, females are more likely to own an Islamic bank account. Years of business experience increase the chance of owning an account, but distance reduces such probabilities. In the second model, gender and household size are the demographic factors affecting the likelihood of a respondent's request for financing facility from an Islamic bank, with females more likely to request for financing than their male counterparts, while size of the household reduces the likelihood. Other determinants of financing request include years of business experience and duration of banking with an Islamic bank. The results also indicate that females who recently joined businesses, as well as customers residing far away from the service provider are more likely to use ATM card frequently than otherwise. From the findings the paper posits that improved provision of financial infrastructure, increase in the number of bank branches in the rural areas and reduction in the costs of services of the Islamic banks are pertinent for improved Islamic financial inclusion in the zone.

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https://doi.org/10.24191/gmvyhn72

## INTRODUCTION

Financial inclusion is simply the provision of a broad range of high-quality financial products, such as savings, credit, insurance, payments and pensions, which are relevant, appropriate and affordable for the entire adult population, especially the low-income segment, according to Enhancing Financial Innovation and Access, EFInA (2013). It is an economic state where individuals and firms are not denied access to basic financial services based on motivations other than efficiency criteria (Amidžić et al., 2014). The Central Bank of Nigeria (CBN, 2018) stressed that financial inclusion entails the delivery of financial services at affordable cost to sections of disadvantaged and low-income segment of the society.

In recent times, financial inclusion has drawn a lot of attention all over the world as a key enabler policy employed by various governments to stimulate inclusive economic growth, entrepreneurship and employment generation, through guaranteeing unrestricted use of formal financial products and services. It also facilitates efficient allocation of productive resources, thus reducing the cost of capital (CBN, 2020; Zhang, 2012). According to Okoye et al. (2017) and Martinez (2011) access to finance can stimulate inclusive growth when such funds are readily available and affordable to various classes of economic agents for productive and economic ventures. Moreover, finance theories, such as the Finance-Growth Theory, Financial Intermediation Theory, Endogenous Growth Theory, among others, have all alluded to the positive role of financial inclusion to inclusive economic growth.

Despite these lofty benefits and theoretical support, enhancing financial inclusion, especially in developing countries, face several constraints. Dabla-Norris et al. (2015) identified three such constraints: participation costs, collateral constraint and intermediation inefficiency due to somewhat the complex nature of modern financial system. In addition, Ozili (2020) pointed to the inconsistency in the results of such a policy where he argued that some of the perceived benefits disappear after a few years, to the extent that the policy leads to what he called "financialization of poverty". It has also been corroborated that the poor are usually not included in the formal financial system as a result of their inability to provide the required collateral (NFIS, 2018). Besides, innovations such as fin-tech, occasioned by financial inclusion policy, have blurred the regulatory boundaries of the financial system, which relegate the powers of financial authorities in discharging their mandates (Beck, 2020). Notwithstanding these challenges, financial inclusion as a policy is believed to play an important role in eradicating poverty and backing up sustainable and inclusive economic growth (World Bank, 2014) which many empirical studies confirm (Nwafor & Aremu, 2018; Wakdok, 2018; Babajide et al. 2020; Atakli & Agbenyo, 2020; among others).

The Nigerian Government in 2012 launched the Nigerian National Financial Inclusion Strategy (NFIS) with the sole aim of reducing the proportion of adults excluded from formal financial services, from 46.3% to 20% by the year 2020 (NFIS, 2012). By capturing Nigerians without access to formal financial services into financial inclusion net, the potentials of mobilizing and accumulating bulk of deposits or savings outside the banking system will be achieved, which will form part of investible funds that will promote productive activity as well as inclusive growth. Since then, some policy prescriptions were made, and priority actions were taken to ensure the realization of such targets. These actions include expansion of digital financial services (DFS), harmonization of knowing your customer (KYC) requirements for opening bank accounts, improvement in cashless payment channels, among others (CBN, 2018).

Despite the policy initiatives, the EFInA (2020) survey revealed that only 64% of Nigerian adults were financially included by the end of 2020, which means that 36% of Nigerian adults, that was about 38 million adults, remained financially excluded. Although there had been growth, it however fell below the NFIS target which aimed at 80% coverage of Nigerian adults within the formal financial system. This piece of information has been corroborated by the CBN (2020) when the apex bank published that the financial

https://doi.org/10.24191/gmvyhn72

inclusion rate had slightly increased from 63.2% in 2018 to 64.1% in 2020, even though the bank cited the adverse effect of Covid-19 as the cause of the marginal performance.

Meanwhile, the level of financial exclusion has not been proportionated across the geopolitical zones in Nigeria. At the expiration of the country's 80% inclusion rate target in 2020, the rate of financial inclusion in each of the 17 southern states was higher than 50%, with four states in the south-west (Ekiti, Lagos, Ondo and Osun) recording 80% and above (CBN, 2020). Contrarily, in the entire 7 north-western states, the rate of financial inclusion was less than 50%, four of which Jigawa, Kano, Katsina and Kebbi recorded less than 30% inclusion rate during the period. Overall, the South-west zone was the most financially included (83%), followed by the South-east zone (78%) and then the South-south (74%). In contrast, North-west (32%) had the lowest proportion of adult population that was netted into the formal financial system (CBN, 2020). Recently, the 2023 Access to Finance survey conducted by EFInA indicated that the financial inclusion rate had increased to 74% in Nigeria, with some 28.8 million adults still excluded. Regrettably, the report of the survey indicated that Northern Nigeria had continued to be the most sternly excluded region, with the North-east and North-west recording 38% and 47% exclusion rates, respectively, compared to only 5% in the South-west and 10% in the South-south, as indicated in Figure 1 below. Rural farmers and dependents who are more likely to be female, living in rural areas of Northern Nigeria, formed the majority of those adults who are financially excluded, the report lamented (EFInA, 2023). This is even as the IMF admitted that financial inclusion in Nigeria *h*as had undeniable successes in its March 2023 report (IMF, 2023).

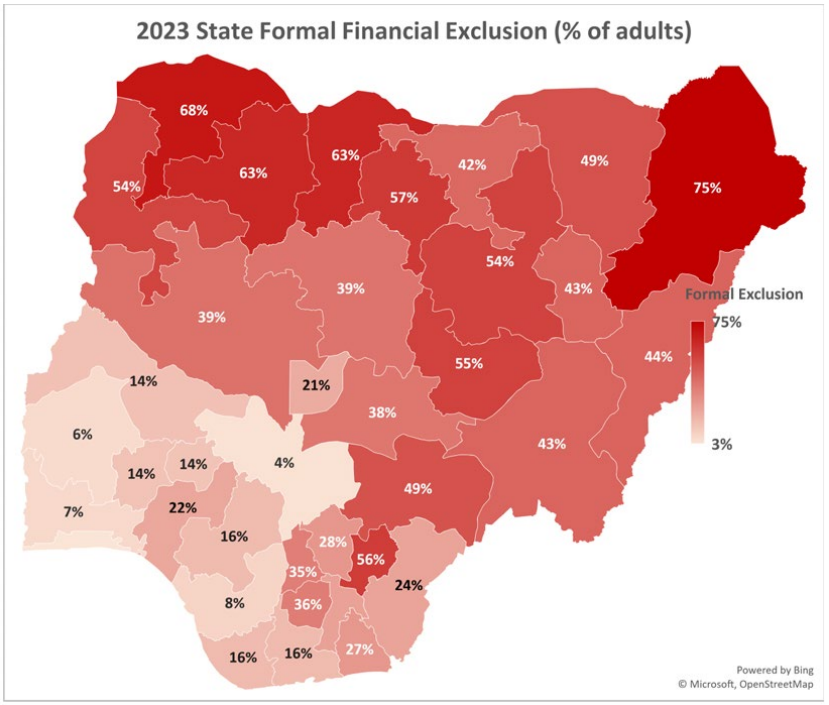


Figure 1. 2023 Formal Financial Exclusion across states in Nigeria, EFInA (2023)

Conversely, few studies investigated the determinants of Islamic financial inclusion in Nigeria, most of which are either desk reviews (Abdullahi et al., 2020) or lessons from the data of other countries rather than Nigeria (Mustafa et al., 2018). On the other hand, Abdu et al. (2018) investigated such

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determinants using a macro cross-section method for selected Sub-Saharan African countries (SSA), including Nigeria. Moreover, Abdullahi et al. (2021) investigated the effect of only Islamic microfinance on Islamic financial inclusion using cross-section method in which only demand-side factors were considered. The major gap identified in the literature is the virtual absence of any research that studies such predictors of Islamic financial inclusion, which covers the entire Northwestern part of Nigeria. One other gap identified is that none of such studies consider the role played by financing requests on Islamic financial inclusion in the study area. Request for financing of real assets by Islamic financial institutions (especially Islamic banks) would likely be a unique determinant of Islamic financial inclusion which has not been investigated. In contrast, conventional banks normally request collateral to give financial loans to their customers, which is seen as another hindrance to financial inclusion.

Accordingly, this paper fills the identified literature gaps by investigating the predictors of Islamic financial inclusion, including customers' request for financing from Islamic banks, covering the entire 7 northwestern states. The paper is an offshoot of the pioneer study in this area conducted by Aliyu et al. (2024), which was a preliminary/pilot empirical investigation conducted using a sample of eighty (80) responses from the large dataset collected. As further evidence, we envisaged using a large-scale dataset to validate the preliminary investigation earlier conducted by Aliyu et al. (2024).

Findings of this study are expected to serve as policy inputs to monetary as well as fiscal authorities in enhancing financial inclusion in the Northwest, to catch-up with the national pace. It is important to state here that the paper only focuses on those adults having access to Islamic financial services in the study area.

For the purpose of presentation, the paper is divided into five different sections including the introduction. The second section reviews literature relevant to the paper, which is followed by the methodology used for the purpose of analysis in section three. Section four presents and discusses the findings, while the last section concludes the paper.

## LITERATURE REVIEW

Financial inclusion is an area of interest to most policymakers, academics, and development stakeholders globally (Arun & Kamath, 2015) due to the increasing transformative power it possesses on socioeconomic development (Sarma & Pais, 2011; Shahul, 2014). It reflects the mounting acknowledgments that financial inclusion plays an important role in eradicating poverty by promoting sustainable and inclusive growth (World Bank, 2014) and an avenue through which individuals and firms are given access to basic financial services not for efficiency but based on motivations so that they can engage in productive activities (Amidžić et al., 2014). The major distinctive feature of the policy is its indiscriminate nature to all income groups, including the vulnerable members of society (CBN, 2018).

Financial exclusion is categorized into voluntary and involuntary exclusion. People who intentionally decide not to partake in the formal financial market because of cultural or religious reasons are voluntarily excluded from the financial system. This exclusion is said to be driven by a lack of demand. Although little can be done to address this form of exclusion because it is not a result of the failure of the market, the provision of attractive financial products and services that will meet the demands of all consumers could help in this respect. On the other hand, factors such as inadequate income and collateral, deficiency in the supply of services, and poor service quality lead to involuntary exclusion. These are usually consequent of the failure of governments, financial institutions and/or the market, and should therefore be addressed through reduction of financial inclusion barriers (Amidžić et al., 2014).

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Trianto et al. (2021) identify three (3) dimensions to measure financial inclusion: access, usage, and barriers. By access, Trianto et al. (2021) simply refer to the availability of financial services in the respective areas. Usage, on the other hands pertains to the degree of subscription to such services, while barriers mean hindrances to the use of the financial services, which may include administrative requirements and logistics costs. This demarcation is, however, blurred because availability of financial services may not necessarily mean accessibility. Sarma (2012) identified more persuasive dimensions of financial inclusion which include: availability, accessibility and usage. Availability is measured in terms of the number of functional financial service outlets in a region, while accessibility is measured by penetration, i.e., the number of adult populations dealing with formal financial institutions. Usage, on the other hand, is measured in terms of the utilization of the services. This paper considers Sarma's dimensions of financial inclusion as its working definition; as such, accessibility in the form of ownership of an Islamic bank account or other Islamic financial services is considered a proxy for financial inclusion.

It is important to emphasize here that Islam advocates for wider circulation of wealth. This is evident from its emphasis on spending, as much as possible, on the welfare of the society, especially the downtrodden members, after fulfilling one's genuine needs (for instance, see Qur'an 2:215; 59:7). In addition, abolishment of interest charges in all financial transactions, the enforcement of the poor due (*zakah*) and law of inheritance are all seen as Islamic institutional framework to ensure wider circulation of wealth (Yasin & Khan, 2016). Within the formal Islamic financial system, instruments such as profit-loss sharing products are designed to reduce hindrances to access to funds, including collateral needs, even if permissible (Ridwan & Poespowidjojo, 2017).

As reported in the background, the majority of the financially excluded adults in Nigeria are found in the Northwestern part of Nigeria. Several factors might have contributed to that setback, which include level of poverty, institutional exclusion, perceptions or attitude (EFInA, 2018), low financial literacy and poor documentation (Orji et al., 2020), and financial infrastructural deficits (CBN, 2020). However, the role of religion, which shapes perception, subjective norm and attitude, should not be underestimated. Northwestern population, in particular, is predominantly Muslims (Mustafa et al., 2018), which adheres to a reasonable extent to Islamic religious values. It is a known fact that Nigeria's, and by extension the global, conventional financial system is predominantly interest-based (Abdullahi, 2013) which is not acceptable under the Islamic legal system (Mustafa et al., 2018); thus, many Muslims do not subscribe to its products and abhor participating in the system for religious reasons (Brekke, 2018; Mustafa & Adebayo, 2015).

To provide an alternative to the conventional financial system, the Islamic financial system, otherwise called the non-interest financial system, came into limelight in Nigeria in 2012 with the commencement of operation of Jaiz Bank Plc. - the first full-fledged Islamic commercial bank in the country, sequel to its licensing by the CBN earlier in 2011 (CBN, 2012). Since then, there has been tremendous growth in the industry, which spurs not only the banking subsector but also the capital market, insurance, *Halal* funds, and recently pension funds (Sabiu & Abduh, 2021; Ogiji, 2021). This development is seen by many as promoting financial inclusion in the country, as individuals hesitant to the conventional financial system due to religious reasons now have a vent through which they can partake in the formal financial system (Abdu et al., 2018; Abdullahi, Othman & Kassim, 2020). Notwithstanding, the predominantly Muslim Northwest remained adamant to the financial inclusion campaign as evident from the reports by both the CBN (2020, 2023) and EFInA (2018, 2022 & 2023).

## Empirical Literature

Studies abound on determinants of financial inclusion since the advent of the policy in the first decade of the 21st Century (Girard, 2021) and its subsequent identification as an enabler for 7 out of the 17

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Sustainable Development Goals (SDGs, World Bank, 2022). Many have written on the topic in Nigeria, investigating the extent of the effects of supply-side factors (Eze & Markjackson, 2020; among others). Others stressed the demand side factors (Ozili, 2020; 2022; 2023). Incidentally, Nsiah and Tweneboah (2023) and Zins and Weill (2016) conducted an Africa-wide study using panel data, considering both demand and supply-side factors. In a different style, a subnational study was conducted by Akinlo and Akinwumi (2019) in Ondo State, Nigeria. In general, all these studies are basically conducted from a conventional finance perspective. Thus, there is a dearth of literature on the determinants of Islamic financial inclusion. In this subsection, we review a handful of such studies to identify the coverage and gaps in the area.

Elsewhere, Ali et al. (2020) investigate the determinants of Islamic financial exclusion in five provinces in Indonesia. A total of 110 financially excluded respondents were selected and interviewed. Using Confirmatory Factor Analysis, the authors identified the major indicators of Islamic financial exclusion in the country. The results indicated that location of a respondent, financial literacy, service quality, financial infrastructure, social influence, and religious commitment are the major determinants of Islamic financial inclusion in the study area. However, the paper leveraged on the subjective views or perceptions of those who were not subscribers to any Islamic financial product to arrive at the findings, which may be biased as no scientific measure was employed.

In their ambitious study, Khmous and Besim (2020) examine the influence of socioeconomic characteristics of individuals and Islamic banking share of the total banking sector assets on Islamic financial inclusion in 14 Middle Eastern and North African (MENA) countries. A simple Probit model was used to estimate the effects of such variables on Islamic financial inclusion. Findings indicate that gender, income level, and age are the major socioeconomic determinants of such inclusion. Specifically, male, rich, and older respondents are more likely to be financially included in these countries. On the other hand, service quality and practices of Islamic banks also contribute to financial inclusion. It is suggested in the paper that the effect of Islamic banks on financial inclusion is more profound in middle-income MENA countries. The study therefore recommended *shari'ah* compliance, reduction in costs, and improved transparency as measures to improve Islamic financial inclusion in the region.

In the same vein, Takidah and Kassim (2021) assess the determinants of Islamic financial inclusion in another 5 regions in Indonesia using a sample of 215 respondents from West Java, Lampung, South Kalimantan, Gorontalo and West Nusa Tenggara, who were included in at least one Islamic financial institution. Both Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) methods were used to classify factors affecting Islamic financial inclusion, and Structural Equation Modelling was used to estimate the degree of influence of such factors. The results indicated that social influence is the major determinant of Islamic financial inclusion in the study area. Meanwhile, Islamic financial literacy, trust, and financial self-efficacy exert less influence on Islamic financial inclusion. The paper therefore suggested policies to improve social influence in the regions.

In Indonesia, Habriyanto et al. (2022) assess the extent to which Islamic financial literacy affects the rate of Islamic financial inclusion in the country. The paper considered a cross-section of 55 different business owners within the creative economy sector who are mostly considered small businesses. Using a survey design, the paper found that knowledge and skills of Islamic financial transactions have a positive impact on Islamic financial inclusion. Thus, the paper concludes that Islamic financial literacy is a major determinant of Islamic financial inclusion in the study area.

The findings of Habriyanto et al. (2022) are not different from those of Kumar and Pathak (2022), which investigated the role of financial literacy and awareness on financial inclusion in Nalgonda and

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Medak districts in Telangana, India. The authors surveyed 200 respondents in those areas. Accordingly, the results indicate that financial awareness is a very good positive determinant of financial inclusion in the study area.

In a dissimilar style, Mujiatun and Badawi (2023) analyze factors militating against Islamic financial inclusion in Indonesia, using the banking sector as a focus sector. The study surveyed literature on the Islamic financial inclusion index in Indonesia, which the apex bank targeted at 90% by 2024. However, the paper found that the Islamic financial inclusion index was 76.91%, which was far from the realization of the target. The major inhibiting factor to achieving the target was discovered to be the poor digitization of the industry. Thus, the study recommended policy regulations to enhance sustainable digitization of the Islamic banking sector in Indonesia, particularly in the post-covid-19 era. The authors believe it is necessary to achieve the 2024 target.

In the same vein, Barus *et al.* (2024) extended the study of Habriyanto et al. (2022) in Indonesia to observe the influence of Islamic financial literacy components on financial inclusion. A cross-sectional survey of 138 micro-businesses was carried out in Pekanbaru, and Path Analysis was conducted. The results revealed that two of the Islamic financial literacy indicators (knowledge and skills) have a positive impact on Islamic financial inclusion. Other findings show a positive and significant relationship between Islamic financial inclusion and micro-business performance. Thus, the study recommends knowledge dissemination and skills of Islamic finance to scale up Islamic financial inclusion in the region.

Recently, Aliyu et al. (2024) assessed the predictors of Islamic financial inclusion in the seven northwestern states in Nigeria, using three indicators of financial inclusion, namely, access to financing facilities, access through automated teller machine (ATM), and access to the use of unstructured supplementary service data (USSD) banking code. The study used data from a cross-section of 80 households and employed logistic regression models for analysis. Findings of the study indicate that household location and years of business experience were the major determinants of access to financing. In addition to these two factors, the age of the respondents inversely affects the use of ATM cards and USSD codes for banking transactions. It is recommended that improved financial infrastructure be provided, especially in rural areas. No doubt, the major limitation of this paper is the limited sample size used in the study.

Other related studies include Abdu et al. (2018), Abdullahi et al. (2020), Ali et al. (2020), Mustafa et al. (2018), Abdullahi et al. (2021), Zulkhibri (2016), and a few others. The reviewed studies have investigated various factors that determine Islamic financial inclusion, ranging from socioeconomic variables to the demand and supply side variables. However, none of these studies considered the influence of customers' request for financing, which is a good attribute of the Islamic financial system, on Islamic financial inclusion.

## Theoretical Framework

Many studies in this area of endeavor have used the Social Exchange Theory (SET) as a theoretical basis for investigating the attitude of economic agents towards financial inclusion (Liyanaarachchi et al. 2021; Barus et al. 2024). This paper follows suit. SET was first mooted by Homans (1958). Initially, the theory emphasized the economic costs and benefits as the major determinants of economic behaviour or choice. Subsequently, Blau (1964) modified the theory to include not only economic but also social factors as determinants of economic transactions (Liyanaarachchi et al. 2021). The cornerstone of this theory is the belief that individuals engage in an economic transaction if they perceive that its benefit exceeds the costs.

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Not only that, social factors such as family values, friendship, and social status are also among factors that influence economic and social transactions (Barus et al. 2024).

In the context of Islamic financial inclusion, SET is relevant in explaining both economic (proximity, reliability, request for finance, lower cost, efficient service) and socio-demographic (age, gender, household size, residential site) factors which determine individual decision making towards Islamic financial product/service subscription (Yusuf & Busari, 2023). Thus, the suitability of the theory for this research.

## METHODOLOGY

The Research designed used in this study is ex-post facto survey design. This design is adopted as it suits the problem at hand as the paper investigates cause-effect relationships by observing factors affecting Islamic financial inclusion in northwestern Nigeria.

### Population, Sampling and Data

As indicated in the background, the paper covers the entire northwest geopolitical zone comprising seven (7) states: Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto and Zamfara. It adopts the use of a survey design in which data is sourced primarily from the field. This becomes imperative due to the nature of the variables of the research. The total population of these states was estimated to be 54,839,886 as at the end of 2019, accounting for 27.3% of Nigeria's estimated population of 201,135,262 during the period (NBS, 2020). However, the rate of financial inclusion in the region was 53%, estimated at 28 million adults in the region, and Islamic financial inclusion accounted for less than 3 million adults.

Of those who are financially included through any of the Islamic banking products/services, eight hundred (800) respondents were selected to form the sample size for this study. A sample of two hundred (200) respondents was drawn from Kano State, being the largest in the region in terms of both population and volume of economic activities, whereas one hundred (100) respondents were drawn from each of the remaining six states in the region. Both cluster and purposive sampling techniques are used for sample selection. In the first stage, the seven states in the region are treated as clusters; within each cluster, the purposive sampling technique is employed to select individuals who subscribe to at least one of the Islamic financial products or services.

A semi-structured questionnaire was used as the instrument of data collection. The questionnaire is designed to capture demographic information, socioeconomic characteristics, financial inclusion status, as well as factors influencing the financial inclusion status of the respondents. Research assistants/enumerators were employed in each state for effective data collection, and souvenirs were gifted to survey respondents as an incentive. The period of data collection lasted for 2 months during the first half of 2023.

### Method of Data Analysis

Three different variables were considered as proxies of Islamic financial inclusion, which cut across both accessibility and usage of the Islamic financial services. Availability was not given much attention since all the respondents were already financially included through at least one of the non-interest financial channels. The proxies include (1) operating an Islamic bank account; (2) access to financing from an Islamic Bank; (3) Access to ATM service of any Islamic Bank.

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This paper employs a logit regression model to analyze the determinants of Islamic financial inclusion in the study area. This is owing to the nature of the dependent variables of the various models, which are dichotomous in nature. Thus, the maximum likelihood methods are needed to estimate such models. The maximum likelihood method selects the coefficients that make the observed values most likely to have occurred. These models have been widely used by previous researchers in related areas (Akudugu, 2013; Wardhono et al., 2016; Abdu & Adem, 2021; Aliyu et al., 2024; among others). The logit model follows the assumption of the logistic distribution function:

The model specifications begin with the simple expression in equation 1:

$$Y_i = \beta X_i + u_i \quad (1)$$

Where $Y_i$ is equal to one (1) if a respondent is financially included in a non-interest financial institution; zero (0) otherwise. Meaning:

$$\begin{cases} 1, & respondent\ is\ Islamic\ financially\ included \\ 0, & Otherwise \end{cases}$$

From equation 1, $Y_i = 1$ if $X_i$ is greater than or equal to a critical value, say $X^*$ and $Y_i = 0$ if $X_i$ is less than a critical value, $X^*$. Thus, the equation represents a binary choice model involving the estimation of the probability of households being included in the non-interest financial institution in the Northwest zone, Nigeria ($Y_i$) given a set of factors ($X_i$). Mathematically, this is represented as:

$$Prob\ (Y_i = 1) = F(\beta' X_i) \quad (2)$$
$$Prob\ (Y_i = 0) = 1 - F(\beta' X_i) \quad (3)$$

The function, F may take the form of a normal, logistic or probability function. The logit model uses a logistic distributive function to estimate, probabilities as follows:

$$Prob\ (Y_i = 1) = \frac{e^z}{1 + e^z} \quad or \quad \frac{1}{1 + e^{-z}} \quad (4)$$

$$Prob\ (Y_i = 0) = 1 - \frac{e^z}{1 + e^z} \quad or \quad 1 - \frac{1}{1 + e^{-z}} \quad (5)$$

Taking the natural log of equations (4) and (5) yields:

$$L_i = \ln\left(\frac{\pi_i}{1 - \pi_i}\right) = Z = \beta_1 + \beta_2 X_i + u_i \quad (6)$$

*Where: L* refers to the log likelihood of odds ratio and $\pi$ refers to the probability of success.

**Model Specification**

The following four (4) models are specified to capture the predictors of both accessibility and usage of Islamic financial services by the respondents. Specifically, the paper adopts having an account with an Islamic bank as well as having an ATM card of any Islamic bank as proxies for accessibility in models one and three. Further, the paper uses household's request for financing from Islamic bank as well as frequency of using an ATM card as measures of usage of Islamic banking services in the second and fourth models, respectively; all of which signify financial inclusion.

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*Model 1: Predictors of having an Islamic Bank Account:*

$$Ln\left(\frac{\pi.acc_i}{1-\pi.acc_i}\right) = \beta_o + \beta_1 gender_i + \beta_2 age_i + \beta_3 hh\_size_i + \beta_4 income_i + \beta_5 h.location_i + \beta_6 YOB\_experience_i + \beta_7 prox\_home_i + \beta_8 prox\_business_i + \beta_9 duration\_bank_i + \beta_{10} Financing_i + u_t \quad (7)$$

*Where:* $Ln\left(\frac{\pi.acc_i}{1-\pi.acc_i}\right)$ stands for the log of odds of a household having account with an Islamic bank and otherwise. $\beta_o, \beta_1, \beta_2, \ldots \beta_{10}$ are the constant and coefficients of the exogenous constructs, respectively, as explained in Table 1.

*Model 2: Predictors of the likelihood that a household has requested for a financing from an Islamic Bank:*

$$Ln\left(\frac{\pi.fin_i}{1-\pi.fin_i}\right) = \beta_o + \beta_1 gender_i + \beta_2 age_i + \beta_3 hh\_size_i + \beta_4 income_i + \beta_5 h.location_i + \beta_6 YOB\_experience_i + \beta_7 prox\_home_i + \beta_8 prox\_business_i + \beta_9 duration\_NIFI_i + u_t \quad (8)$$

*Where:* $Ln\left(\frac{\pi.fin_i}{1-\pi.fin_i}\right)$ stands for the log of odds of a household has accessed financing at least once from an Islamic bank or otherwise. $\beta_o, \beta_1, \beta_2, \ldots \beta_9$ are the constant and coefficients of the explanatory variables, respectively.

*Model 3: Predictors of possessing an Islamic Bank ATM Card*

$$Ln\left(\frac{\pi.ATM_i}{1-\pi.ATM_i}\right) = \beta_o + \beta_1 gender_i + \beta_2 age_i + \beta_3 hh\_size_i + \beta_4 income_i + \beta_5 h.location_i + \beta_6 YOB\_experience_i + \beta_7 prox\_home_i + \beta_8 prox\_business_i + \beta_9 duration\_NIFI_i + \beta_{10} Financing_i + u_t \quad (9)$$

*Where:* $Ln\left(\frac{\pi.ATM_i}{1-\pi.ATM_i}\right)$ stands for the log of odds of a household has accessed financing at least once from an Islamic bank or otherwise. $\beta_o, \beta_1, \beta_2, \ldots \beta_{10}$ are the constant and coefficients of the explanatory variables, respectively.

*Model 4: Predictors of the Frequency of ATM usage*

$$Ln\left(\frac{\pi.fATM_i}{1-\pi.fATM_i}\right) = \beta_o + \beta_1 gender_i + \beta_2 age_i + \beta_3 hh\_size_i + \beta_4 income_i + \beta_5 h.location_i + \beta_6 YOB\_experience_i + \beta_7 prox\_home_i + \beta_8 prox\_business_i + \beta_9 duration\_NIFI_i + \beta_{10} Financing_i + u_t \quad (10)$$

*Where:* $Ln\left(\frac{\pi.fATM_i}{1-\pi.fATM_i}\right)$ stands for the log of odds of a household has accessed financing at least once from an Islamic bank or otherwise. $\beta_o, \beta_1, \beta_2, \ldots \beta_{10}$ are the constant and coefficients of the explanatory variables, respectively.

The models control the appropriate socioeconomic characteristics of the respondents which may explain variations in choices among the individuals.

The maximum likelihood method was used to estimate the parameters. The estimation procedure resolves the problem of heteroscedasticity associated with other estimation techniques such as the Linear Probability Model (LPM). It constrains the conditional probability of inclusion of individual adults in the formal financial market to lie between zero (0) and one (1). The statistical software used for the purpose of the analysis is Stata (V. 15) due largely to its suitability in handling discrete econometric models like logit and its ability to generate the Odd-ratios necessary for the interpretation of the results.

https://doi.org/10.24191/gmvyhn72

For the purpose of analysis, only the responses of those participants indicated whether they are financially included or otherwise are included in the analysis. As explained earlier, the measures of financial inclusion used in the study include having an Islamic bank account, using an Islamic bank ATM card, as well as access to Islamic bank financing. These responses are considered relevant to the problem at hand and are utilized in the estimations of the models.

### Description and Measurement of Variables

In this subsection, the description of the variables used in the study and their measurements are explained in Table 1. The table also provides justifications for the use of such variables.

Table 1. Description of Variables

| Variable | Description | Justification |
|---|---|---|
| Gender | This is a dummy variable which takes value of 1 for male and 0 otherwise. This is expected to be + | Without prejudice, males are likely to be more financially included than females. |
| Age | Household age (in years). A proxy of used to measure age of households in years. This is coded as 0, 1, 2, 3 & 4 for a range between: 18years to > 60years. | Age of a household affects financial inclusion and the older household, the less likely he/she will be financially included. |
| Income | This is the total amount of income received by a household. The variable is expected to have a positive (+) influence on financial inclusion. | Higher income is often associated with greater need for banking services and hence greater financial inclusion. |
| Household size | Number of members in a household. This is expected to be positive [below 5 = 0; 6-10 = 1; 11-15 = 2; 16-20 = 3 & > 21 = 3] | All things being equal, the larger the size of household, the higher the need for financing |
| Household Location | A proxy for the home location of the household [Urban = 1 and Rural = 0]. | Since most of the branches of the IFIs are located in the urban centers then rural dwellers are less likely to access IFIs' services due to distance |
| Having an Account with NIFI | A dichotomous variable coded as: [Yes = 1 & No = 0]. | This is first step towards being financially included. |
| Duration with NIFI | A proxy of used to measure years of banking experience of households in years. This is coded as 0 & 1 for a range between: < 5year & > 5years. | It is expected that the more the higher years spent with the bank the greater the financial inclusion. |
| Proximity to NIFI | A proxy which captures closeness of NIFI households' location in terms of: [House = 0; Office = 1; Market = 2 & Others = 3] | Closeness to any of these options could influence households' decision to access banking services provided by NIFI and otherwise. |
| Duration to reach NIFI | The variable is used to measure length of time it takes households to reach NIFI. This is measured in exact number of minutes by each respondent. | The longer time it takes households to reach NIFI the more it adversely affects his desire for banking services as that may be associated with an additional cost. |
| Years of Business (YOB) experience | A proxy of used to measure years of business experience of households in years. [Less than 3 years = 1; 3-5years = 2; 6-10years = 3 & > 11years 4] | It is expected that the higher the number of years of business experience the greater the level of financial inclusion. |
| Use of ATM card | A dichotomous variable is coded as: [Yes = 1 & No = 0]. It is used as a dependent variable. | Possession and use of an ATM card are important barometers of financial inclusion in the literature. |
| Access to financing facility | A dichotomous variable is coded as: [Yes = 1 & No = 0]. It is used as a dependent variable. | This is meant to assess whether a household has requested a financing facility from NIFI or not. |

Source: Researchers' compilation, 2024

## RESULTS AND DISCUSSION

The responses retrieval rate was very good as over 760 responses were completed and returned by the respondents through the research assistants, which represents an impressive 95%. However, for the purpose analysis, only those responses that are found suitable were used. This is as some of the questions

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were not attended to by the respondents. Table 2 presents the demographic and socioeconomic statistics of the respondents.

Table 2. Predictors of Access to Islamic Bank Account

DV: Operating Account with an Islamic Bank

| Variable | Coefficient | Odds Ratio |
|---|---|---|
| Gender | -1.070*** | 0.628*** |
| | (0.064) | (0.0103) |
| Age | 0.0437 | 1.045 |
| | (0.0440) | (0.0460) |
| Household size | -2.274*** | 0.103*** |
| | (0.793) | (0.0816) |
| Monthly Income of the family head | -1.86e-05 | 1.000 |
| | (2.99e-05) | (2.99e-05) |
| Household location | 2.162 | 8.686 |
| | (2.293) | (19.92) |
| Years of working/business experience | 0.312*** | 1.366*** |
| | (0.0711) | (0.0972) |
| Proximity of the provider to home | -5.245*** | 0.00208*** |
| | (1.667) | (0.00478) |
| Proximity of the provider to business | -3.525** | 0.0295** |
| | (1.412) | (0.0416) |
| Duration of banking with Islamic bank | -0.775** | 0.460** |
| | (0.334) | (0.154) |
| Access to Financing | 1.61e-05** | 1.000** |
| | (7.78e-06) | (7.78e-06) |
| Constant | 31.92*** | 7.268e+13*** |
| | (8.528) | (6.198e+14) |

**Note:** Robust standard errors in parentheses and *** p<0.01, ** p<0.05, * p<0.1

Source: Researchers' computation using STATA, 2024

Table 2 presents the results of the determinants of access to Islamic bank accounts. Among the socioeconomic variables, both gender and size of the household significantly impact the likelihood of having an Islamic bank account in the study area. Interestingly, females are more likely to own an Islamic bank account than their male counterparts in the study area, with odd ratio of 0.628 to 1 (or about 2:3) in the study area, which contradicts the finding of Khmous and Besim (2020), which favors males. For household size, a unit increase in the number of household members reduces the chances of having an Islamic bank account by -2.274, with an odds ratio of 0.103:1 as the household size increases. Income of the household has not shown any impact on the likelihood of owning an Islamic bank account, which corresponds to the conclusion of Abdu *et al.* (2018) but is contrary to the findings of Khmous and Besim (2020). Meanwhile, years of business experience positively impact such likelihood with an odds ratio of 1.366:1 in favour of additional years of experience. Also, distance of both home and workplace/business to

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the Islamic banking service provider adversely affects the likelihood of having an Islamic bank account, as the likelihood decreases with an increase in distance from home and business—odds ratios 0.00208 and 0.0295, respectively. Most previous studies reviewed have not considered these important effects. Again, the duration, measured in terms of the years of experience with an Islamic bank, affects the likelihood of owning the account, with an odds ratio of 0.460. Lastly, the result indicates a 1:1 odds ratio between the increase in the amount of money requested by the respondent for financing and the likelihood of owning an Islamic bank account. Often, households' desire for financing from non-interest banks is the force driving financial inclusion.

Table 3. Access to Financing from an Islamic Financial Institution
DV: Access to Islamic Bank Financing

| Variables | Coefficient | Odds Ratio |
|---|---|---|
| Gender | -0.701*** | 0.280*** |
| | (1.640) | (0.0103) |
| Age | 0.0437 | 1.045 |
| | (0.0440) | (0.0460) |
| Household size | -2.244*** | 0.093*** |
| | (0.793) | (0.0816) |
| Monthly Income of the family head | -1.16e-05 | 0.901 |
| | (2.21e-05) | (2.22e-05) |
| Home location | -2.170 | 7.671 |
| | (2.133) | (18.91) |
| Years of Business/working experience | 0.401* | 1.561* |
| | (0.147) | (0.192) |
| Proximity of the provider to home | -2.013 | 0.301 |
| | (1.116) | (0.354) |
| Proximity of the provider to business | -2.723*** | 0.0657*** |
| | (0.916) | (0.0602) |
| Duration of banking with Islamic bank | -0.641* | 0.527* |
| | (0.364) | (0.192) |
| Constant | 1.471 | 4.355 |
| | (1.804) | (7.855) |

**Note:** Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Source: Researchers' computation using STATA, 2024

From Table 3, gender and household size are the only demographic factors affecting the likelihood of a respondent requesting a financing facility from an Islamic bank. The results show that females are more likely to request such financing, odds ratio 0.28:1, compared to their male counterparts. On the other hand, the size of the household reduces the likelihood of a respondent requesting the financing, as indicated by the odds of 0.093. Other determinants of financing requests from an Islamic bank in the study area include years of business experience, proximity, and duration of banking with an Islamic bank. Specifically, years of business experience increase the chance of respondents' request for a financing facility. In contrast, both distance of the service provider to the household's business premises, as well as the duration of banking, impact negatively on the likelihood of a household's request for financing, perhaps because distance is deterrence to seeking for financing from an Islamic bank in the study area. Implicit in this finding, those in the rural hard-to-reach areas may likely be disadvantaged when it comes to access to Islamic bank financing.

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Table 4. Access and Usage of Islamic Bank ATM Card
Model III DV: Access to Islamic Bank ATM Card
Model IV DV: Frequency of Usage of Islamic Bank ATM Card

| | Model III | | Model IV | |
|---|---|---|---|---|
| **Variable** | **(1) Coefficient** | **(2) Odd Ratio** | **(3) Coefficient** | **(4) Odd Ratio** |
| Gender | -2.071** | 0.126** | -0.872*** | 0.418*** |
| | (0.847) | (0.107) | (0.295) | (0.123) |
| Age | -0.0278 | 0.973 | 0.0309** | 1.031** |
| | (0.0259) | (0.0252) | (0.0144) | (0.0148) |
| Size of Household | -0.318 | 0.727 | - | - |
| | (0.455) | (0.331) | | |
| Monthly Income of the household | -0.789 | 0.454 | - | - |
| | (0.595) | (0.270) | | |
| Home location | 0.282 | 1.326 | - | - |
| | (0.547) | (0.725) | | |
| Years of working/business experience | 0.626 | 1.870 | -0.113** | 0.894** |
| | (0.505) | (0.944) | (0.0505) | (0.0451) |
| Proximity of the provider to home | 1.198** | 3.313** | -0.569* | 0.566* |
| | (0.609) | (2.017) | (0.292) | (0.165) |
| Proximity of the provider to business | -1.465** | 0.231** | 0.675* | 1.964* |
| | (0.601) | (0.139) | (0.352) | (0.692) |
| Duration of banking with Islamic bank | 0.323 | 1.381 | -0.0283 | 0.972 |
| | (0.246) | (0.339) | (0.131) | (0.127) |
| Access to Financing | 1.07e-06 | 1.000 | 1.05e-09 | 1.000 |
| | (7.60e-07) | (7.60e-07) | (1.43e-07) | (1.43e-07) |
| Constant | 10.22* | 27420* | 2.650*** | 14.15*** |
| | (5.683) | (155822) | (0.856) | (12.11) |

**Note:** Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Source: Researchers' computation using STATA, 2024

Table 4 reports the results of two models on having an ATM card and its usage. Evidently, gender is the only socioeconomic variable that seemingly influences owning an ATM card. The result indicates that females are more likely to own an ATM card than males by an odds ratio of 0.126, which is equivalent to about an eight-to-one male-to-female ratio. Apart from gender, proximity to home and /or business as well as length of time it takes to get to a service provider are found to be strong predictors of the likelihood of having an ATM card. For instance, households residing far away from the service provider are more likely to own an ATM card with an odds ratio of 3.313 (about 10:3) in their favour. Also, those households that take a longer time to reach the Islamic financial service are more likely to own an ATM card. Perhaps this could save them the trouble of travelling long distances to withdraw cash or other transactions, particularly with the prevalence of POS service. The results validate the earlier findings by Aliyu et al. (2024) in the same study area.

On the other hand, the frequency of the use of ATM is determined by gender, age, years of business experience, proximity to service provider, duration of transaction, and request for financing of home appliances. Females with fewer years of business experience are more likely to use an ATM card than men (odds ratio = 0.418), an indication that women are more likely to be financially included through the use of an ATM card. Intuitively, those whose homes are closer to service provider(s) are less likely to use ATM

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frequently compared to those living far away. Contrarily, proximity to one's business is a good determinant of the use of ATM (odds ratio = 1.964). Also, the preliminary findings of Aliyu et al. (2024) are corroborated here, suggesting the unbiased nature of the data, which is a validation of the Central Limit theory.

### Policy Implications of the Findings

The rate of financial inclusion in the Northwestern region is quite unimpressive compared to the rates in the other regions in Nigeria. The population in this region is predominantly Muslims. Thus, promotion of the Islamic financial system to supplement its conventional counterpart would, expectedly, reduce the rate of exclusion in the region. However, findings of this study indicate that the success of this exercise is contingent on some key factors. Notable among them are proximity of Islamic banks to the people, advances of financing, banking experience, and costs of Islamic financial services. Other determinant factors are basically socio-demographic, which include gender, size of household, years of business experience, as well as residential area of the customers.

These findings have far-reaching policy implications. The monetary authorities in the country as well as fiscal authorities have roles to play to ensure the region is liberated from financial exclusion. From the monetary side, CBN should enact policies that would ensure adequate financial infrastructure in those areas. Banks, and particularly Islamic banks, should be mandated to have operational outlets, particularly in the rural areas, so that they bring banking services closer to people. Again, ATM services should be made available where establishing bank branches is practically impossible.

To augment these efforts, Islamic banks should leverage on the existing Islamic financial modes of contracts to provide additional financing, especially to rural dwellers. The rural economy is particularly agrarian; as such, products like *Salam, Muzāra'ah, Musāqah,* among others, would go a long way in attracting customers. Notwithstanding, Islamic banks in the area should liaise with experts in Islamic finance to innovate new products that match the prevalent economic activities in the region. However, Islamic banks have to be cost-efficient to attract additional subscribers to their products, as shown by the results.

The fiscal side should embark on programmes and interventions that could serve as catalysts for financial inclusion in the region. Interventions like agribusiness subvention/loan, small business subsidization, and conditional cash transfers should be executed through Islamic financial institutions in the region. This will motivate many people in the region to subscribe to Islamic banks as postulated by the Social Exchange Theory.

In the socioeconomic domain, both government and CBN should intensify campaigns for financial inclusion among female folks and package gender sensitive products, such as women sensitization, girl-child education, women entrepreneurship, among others.

## CONCLUSION

Financial inclusion is key to the attainment of inclusive growth, especially among rural dwellers. Among numerous dimensions of measuring financial inclusion in the literature, this paper utilizes four dimensions; that is, two measures each of access and usage of financial inclusion. Access dimensions are having an account with an Islamic bank and possessing or owing an ATM card, whereas the usage dimension has the frequency of using an ATM card and obtaining financing from an Islamic bank. Using survey data of 800 respondents/households across the seven States (Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto & Zamfara) in Northwestern Nigeria, the paper constructs empirical models based on standard socioeconomic cum demographic characteristics of households in the study area and other predictor

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variables. From the findings, the paper concludes that among the demographic features of the respondents, gender, size of the household, years of business experience, and distance to the banks significantly impact the likelihood of having an Islamic bank account. Whereas females are more likely to own an Islamic bank account, the number of dependents reduces the chance of owning an account. Years of business experience increase the chance of owning an Islamic bank account, but distance to the facilities reduces such probabilities.

The paper also concludes that females are more likely to subscribe to an ATM card than males, and customers residing far away from the service provider are more likely to own an ATM card. On the other hand, females who recently joined businesses are more likely to use ATM cards frequently, whether on ATM machines or POS. Lastly, factors that determine requests for Islamic bank financing in the study area include gender, size of household, years of business experience, and proximity to the service provider. Impliedly, those in the rural hard-to-reach areas may likely be disadvantaged when it comes to access to Islamic bank financing facilities.

To promote financial inclusion in northwest Nigeria, the following recommendations are proffered. First, there is the need for more branches of Islamic banks to be opened, as proximity /distance is found to be a significant determinant of Islamic financial inclusion. Islamic banks can open more rural outlets in the northwestern region to tap the ever-increasing demand for formal financial services in those areas. Moreover, investors can establish microfinance to exploit the opportunities and foster financial inclusion.

Islamic financial institutions should improve the digitalization of their services to reduce the duration or time taken during transactions, which scares away people from opening accounts with them, according to our findings. It is observed from the results that individuals seeking to finance projects, such as mortgages, vehicles, or even working capital, did not seem to own accounts with Islamic financial banks, perhaps due to relatively higher costs of financing the products. Thus, Islamic financial institutions should develop a business model that would reduce the costs of their products and services so as to attract more households into the Islamic financial inclusion net.

## ACKNOWLEDGEMENT

The authors extend their sincere appreciation to all the participants in this study.

## CONFLICT OF INTEREST DECLARATION

The authors declare no conflict of interest regarding this study.

## CO-AUTHOR CONTRIBUTION

M.I. Abdullahi was assigned to compile the literature review, gather and analyse the data, and draft the article. S.U.R. Aliyu monitored the research process and provided critical supervision. A.H. Danlami ensured the manuscript conformed to academic precision and substantial clarity. F.M. Shehuco supervised the research process and reviewed the study. All authors participated in the finalization of the manuscript for publication.

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## AI GENERATIVE DECLARATION

The author declares that generative AI tools were not used in the creation of this article, except for text paraphrasing and cross-checking references. The author assumes full responsibility for the accuracy, integrity, and final content of this work.

## RESEARCH ETHICS STATEMENT

The authors declare that this study did not involve any human biological samples or data, or animal subjects. Consequently, formal ethics committee approval and informed consent were not required for this research.

## DATA AVAILABILITY STATEMENT

The data supporting the findings of this study are available from the corresponding author upon reasonable request, subject to institutional and ethical requirements.

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https://doi.org/10.24191/gmvyhn72