MEASUREMENT AND DETERMINANTS OF ENERGY POVERTY AMONG UNIVERSITY ACADEMIC STAFF IN KWARA STATE, NIGERIA

MUNNA OSIMADEJI SHEIDU
Economics Department, Al-Hikmah University, Ilorin, Nigeria
sheidumunna@gmail.com; +2348143545335

SAIDAT OLUWATOYIN ONIKOSI-ALLIYU
Economics Department, Al-Hikmah University, Ilorin, Nigeria
soonikosi@alhikmah.edu.ng; +2348100398940

ABSTRACT
One of the fundamental problems facing emerging nations, especially sub-Saharan Africa, is access to sustainable, dependable, and cheap energy services. Despite the abundance of natural resources in Nigeria, inadequate energy access plays out for university lecturers and other country residents. Therefore, using a Multidimensional Energy Poverty Index assessment, this study explores the intensity of energy poverty and its underlying factors among academic staff members at universities across Kwara State, Nigeria. Data were obtained from 354 university lecturers across federal, state, and private universities throughout Kwara State through a cross-sectional survey approach. The assessment of factors influencing energy poverty among university lecturers relies on descriptive statistics, ordinary least squares (OLS), and Tobit regression as the evaluation methods. The study found that most lecturers across the study have demonstrated multidimensional energy poverty status because they lack access to reliable electricity, contemporary cooking fuels, and efficient lighting solutions. The study also reveals that income, house ownership, age, and gender status determine energy poverty among University lecturers in Kwara State, Nigeria. The study, therefore, recommends targeted economic interventions by the government, policymakers and university administrators, as a strategic solution instead of applying broad demographic-based methods.
Keywords: Determinants, Energy Poverty, Measurement, Ordinary Least Squares, Tobit Regression
JEL Classification: I31, I32, O13, Q01

1. INTRODUCTION
Energy poverty remains a critical global challenge, especially in developing countries where millions of people struggle to obtain dependable, affordable sustainable energy services because of energy poverty. The International Renewable Energy Agency (IREA) (2023), reports that worldwide, 675 million citizens live without power access, and eighty percent of these individuals reside in sub-Saharan Africa. Energy poverty encompasses power access limitations along with problems regarding energy expenses, service quality, and utilisation efficiency (Ruiz-Rivas et al., 2022). Energy poverty exists in developed countries because excessive energy expenses stop households from having sufficient heating, lighting capability and cooling functionality (Streimikiene & Kyriakopoulos, 2023). In developing countries, energy poverty manifests as severe problems because of low electricity access, regular power interruptions, and traditional biomass cooking practices (Kez et al., 2024).
Moreover, in Africa, especially in Nigeria, the energy poverty crisis persists despite its substantial natural resources (Colins &Ugwoke, 2024). Nigeria possesses extensive gas resources and is the leading oil producer in Africa. Nevertheless, the vast resources do not resolve the energy access problem since more than 85 million Nigerians, representing 40% of the population, lack access to electricity (Rural Electrification Agency, 2023). Also, the availability of electricity through the national grid does not solve energy insecurity because unreliable power distribution, high electricity rates, and weak power networks impact millions

nationwide (Aigheyisi & Oligbi, 2020; Ogbebor &Onoriode, 2021). Numerous individuals and businesses sustain their operations by using expensive yet environmentally harmful generator alternatives during periods of power outages (Alo & Adeyemo, 2021).

Research on energy poverty has been carried out extensively within its rural areas and low-income communities, but university academic staff remains a vital yet overlooked segment. University lecturers heavily require electricity for teaching, research and administrative tasks, although these activities face regular power disruptions with high electricity expenses and insufficient institutional power systems (Adeyonu et al., 2022). The power supply issues in Nigerian public universities have reached a crisis level due to persistent financial deficits and decreased government investment, leading to broken energy systems and unstable electricity networks (Babatunde et al., 2022). The scarcity of energy creates multiple issues which hinder academic output, reduce research production and degrade the overall health status in these higher education institutions (Famewo & Uwala, 2022).

Kwara State, situated in the North-Central region of Nigeria, houses multiple Universities, including Federal, State, and Private Universities. Academic institutions operating in the state gather numerous academic experts whose work depends on stable electricity. The power supply of Kwara State faces extreme instability that produces regular power outages, fluctuating voltage and increasing electricity tariffs that affect University functions negatively. Academic staff members, therefore, use personal alternative energy systems including generators, solar panels and inverters that increase their financial expenses. The energy supply in Kwara State stands as less problematic than other rural areas of Nigeria yet the supply of energy is inadequate in providing effective support to higher education facilities. However, traditional measurement methods like electrification rates and energy expenditure thresholds fail to represent the complexity of energy poverty (Leverenz, 2023). The Multidimensional Energy Poverty Index (MEPI) provides a complete assessment system which incorporates energy access, affordability, reliability and clean energy utilization (Koomson & Danquah, 2021). Previous research findings have proven that household income levels together with property ownership status and dwelling facts as well as household composition and institutional regulations and energy conservation standards affect the extent of energy poverty (Das et al., 2022). It is however noted that studies which explore the energy poverty situation of university lecturers as an independent socio-economic group are scarce especially within Kwara state and other states from the North-Central part of Nigeria.

To fill this research gap, this study’s objective is to investigate prevalent energy poverty among university staff in Kwara state and understand its major determinants. University lecturers’ energy challenges require analysis to develop proper policies since insufficient electrical power disrupts educational research capabilities, classroom instruction quality and the well-being of higher education faculty members. The subsequent sections highlight the literature review with theoretical aspects and empirical evidence regarding energy poverty measurement and determining factors, followed by a description of data collection methods and estimation techniques. The study ends with a results presentation followed by a conclusion and policy recommendation section.

2. LITERATURE REVIEW

This section includes the theoretical and empirical evidence for measuring energy poverty and its determinants.

2.1 Theoretical Review

There are various theories that generate separate views regarding the sociological factors leading to energy poverty together with their impacts on economic differences.

The energy ladder theory provides an initial explanation of how households in developing nations choose their energy consumption patterns. Economic improvements grant individuals better access to energy sources thus they move from animal dung and firewood to electricity and petroleum products (Xiao et al., 2021). In this theory, people experience three hierarchical stages of energy consumption starting from biomass use and evolving into a combination of traditional and modern system usage and finally achieving access to contemporary clean and efficient methods (Kroon et al., 2013; Treiber et al., 2015). The theory works from an economic viewpoint but neglects cultural factors together with availability and social elements (Sovacool, 2021). Wealthy families continue traditional fuel use because of their expensive modern energy infrastructure and their specific cultural traditions.

Another theory is the energy justice theory. According to Soriano-Hernández et al. (2022), energy justice theory demonstrates energy poverty as an equality-based human rights issue from a social inclusion perspective. According to this theory, resource access exceeds financial considerations since it represents access to economic possibilities and requirements for fair resource distribution as well as the active participation of all stakeholders in decision-making and social acceptance (Bouzarovski, 2018). The three primary elements of energy access justice are ensuring equal resource distribution through distributive justice, stakeholder-inclusive decision-making via procedural justice and recognition justice, which meets the particular energy needs of excluded groups. The justice framework is a fundamental tool for understanding regions where essential energy access imbalances exist between urban and rural communities and socioeconomic groups.

Another theory of energy poverty is the capability theory developed by Sen (1993). It presents a human-centred approach to energy poverty by viewing deprivation of capabilities instead of resource scarcity. Energy access cannot be adequately assessed through income or fuel utilisation data because it needs to be measured against the capabilities which energy creates for human well-being and productivity opportunities. According to this philosophy, energy functions as an instrument that students of human development can use to grow their independence. The capability approach contrasts with material-based poverty measures because it examines whether individuals can access energy resources for better life conditions and work success (Leverenz, 2023). The measurement of capabilities remains a challenge because energy access does not necessarily lead to effectively utilising this resource.

2.2 Empirical Review

The measurement of energy poverty differs between countries since it depends on specific economic conditions, energy systems, and social circumstances. Developed nations employ expenditure-based and consensual approaches for temporary energy deprivation assessment, while developing nations have adopted multidimensional indices that include energy access, reliability, and affordability. The analysis conducted by Drescher and Janzen (2021) with the German household database revealed that energy poverty affected 78% of the surveyed households at some point during the research period. The findings suggest that most experiencing this condition only endured it temporarily, showing energy poverty in developed countries is periodic rather than persistent. The research also demonstrates that expense-based measures do not detect individuals who deprive themselves of the required energy because they cannot afford enough for their needs. Through the consensual approach, researchers identified households that cut back on energy consumption due to financial challenges, which enhanced the comprehension of this issue in developed economic settings.

In contrast, developing nations endure persistent and systemic levels of energy poverty so multidimensional evaluation methods like MEPI prove more applicable. The MEPI framework analyses energy poverty through H (headcount ratio) and A (intensity) indicators that evaluate both population percentages affected and the extent of deprivation across various dimensions. A study by Manasi and Mukhopadhyay (2024) based on NFHS-5 (2019–2021) Indian survey data determined moderate energy poverty levels and notable differences between regions. Abbas et al. (2022) also studied energy poverty levels in 59 developing nations of Asia and Africa by assessing six different poverty indicators, including lighting and cooking, indoor pollution, telecommunications, entertainment and household appliance access. The research showed extensive energy poverty problems, which affected various aspects of life, especially in poor economic areas.

Various research projects demonstrate that evaluating energy poverty through multiple dimensions produces superior results than using single assessment methods. Kez et al. (2024) conducted a study on energy poverty that demonstrated that simple expenditure-based indicators inadequately measure complex energy deprivation, but multidimensional indices present a comprehensive view through the incorporation of spatial dynamics, household preferences, and cultural contexts. MEPI demonstrates flexibility, positioning it as the primary instrument for determining energy poverty levels in various economic and social structures. Acharya and Sadath (2022) analysed the influence of energy expansion on poverty alleviation in six Indian states from 2015 to 2018. The researchers validated policy intervention effectiveness through their 30% decrease in absolute multidimensional energy poverty levels. Ullah and Khan (2021) used MEPI to evaluate Pakistan's energy poverty situation. The result found a general decline in poverty, but different regions experienced varying degrees of change. Analysis through the M-Gamma method (MEPI-U) indicated that Uganda had a total multidimensional energy-poor population of 66%, where 33% experienced severe energy poverty status (Ssennono et al., 2021).

In Nigeria, Adeyonu et al. (2022) conducted MEPI research in six rural Nigerian geopolitical zones through NLSS 2018–2019 data analysis. The research showed that 90% of participants lived underneath the MEP line. The North East established the highest energy poverty rate (98.7%) compared to the South West with the lowest rate (82%). Babatunde et al. (2022) researched Kwara State rural households by measuring their cooking energy poverty through the expenditure method. The research demonstrated that 59% of rural household members used traditional fuel types. The calculations by Ashagidigbi et al. (2020) with National Demographic and Health Survey (NDHS) data showed national energy poverty at 0.38, but rural areas experienced higher deprivation rates.

Moreover, energy poverty assessment employs distinct measurement methodologies that present different analytical viewpoints. These techniques include an expenditure-based assessment, a consensual technique, and the Multidimensional Energy Poverty Index (MEPI). Different measurement approaches adopted for energy poverty analysis offer unique advantages and limitations based on particular circumstances.

The expenditure-based assessment technique evaluates energy poverty by comparing household earnings and energy-related expenses. Research shows that households fall under the category of energy poverty when their energy expenses reach above or below stipulated levels (Leverenz, 2023). Another approach in the literature is the consensual method. This approach assesses energy poverty through the use of subjective and objective indicators from survey and interview data collection (Leverenz, 2023). In this approach, household deprivation levels are studied using a methodology which determines if home residents consider themselves to be energy-poor and encounter interruptions to their energy services. This assessment produces information about major energy poverty patterns which combines individual and family insights. However, the method presents difficulties for use across different nations since survey answers require personal perception and cultural context awareness (Ssennono et al., 2021).

In addition, a more comprehensive approach is the Multidimensional energy poverty index (MEPI). The MEPI serves as an enhanced analytical assessment that merges multiple facets of energy deprivation throughout its structure. This evaluation method unites assessments of cooking together with lighting units and household appliances as well as entertainment/education and communication to create a full understanding of energy deprivation (Koomson & Danquah 2021). The MEPI approach is extensively used by developing nations because it merges both economic aspects and clean energy adoption criteria into its framework. National relationships become possible through this method because it generates two composite index types at both entity and group levels (Nagothu 2016; Ssennono et al. 2021). These previous studies dealing with energy poverty adopted various indicators and measurement methods, but their measurements are limited in scope because they do not account for the unique scenario of professional groups. This study investigates specific indicators relevant to teaching staff at universities, which include power supply accessibility and usage of alternative energy systems

3. METHODOLOGY

This study relies on a quantitative research design to analyse the extent of energy poverty among university lecturers in Kwara State, Nigeria. A cross-sectional survey design was used to evaluate the extent of energy poverty and its determinants. Ten institutions located in Kwara State, including federal, state and private universities, form the population of this study. A representative sampling approach makes use of stratified sampling methods. The study will automatically include federal and state universities, while three private universities were chosen based on purposive sampling, feasibility and resource limitation. A total of 354 lecturers were selected from the 3,061 University staff members in Kwara State through a calculation derived from Taro Yamane’s method which represented a 5% margin of error at a 95% confidence level.

The primary research instrument for this study consists of structured questionnaires designed to achieve the objectives. The survey is divided into four sections that cover socio-demographic characteristics, energy services evaluation in residences and working environments, household income and related energy costs, and household lighting and cooking practices. The questionnaire passes through face and content validation procedures to maintain reliability and validity as Cronbach’s Alpha measures how well the instruments capture energy poverty.

3.1 Theoretical Framework

The capability theory of human development serves as this study's foundation because it shows how energy poverty creates capability deprivation (Sen, 1993, Ssennono et al., 2021). The theory posits that individuals should possess the freedom to achieve well-being provided they have the essential capabilities. When people cannot access cost-effective sustainable energy services they do not have the opportunity to carry out vital tasks like productive duty, education and basic living requirements. The capability theory presents itself as a suitable analytical framework for energy poverty because it provides a flexible multidimensional structure that can evaluate financial, social and institutional factors that determine access to energy services. By applying this theory, the research investigates the factors that determine energy poverty among University lecturers in Kwara, Nigeria. For measuring energy poverty, the Multidimensional Energy Poverty Index (MEPI) serves as the selected framework because it evaluates energy poverty through all its dimensions going beyond basic electricity access. MEPI suits well for investigating university lecturers because their energy requirements surpass standard access to electricity by requiring continuous electrical availability for academic duties, research and administrative operations.

However, there are some constraints to the implementation of the MEPI methodology. The threshold-based cutoff methods applied by this measurement produce oversimplified results because they force individuals to be placed in either an energy-poor or non-energy-poor category. A threshold-based classification system might fail to recognize the subtle differences in energy deprivation among university lecturers. Also, the MEPI framework does not directly assess subjective experiences about energy poverty alongside personal actions for dealing with it or behavioural adjustments made by affected people. The consensual approach and the Energy expenditure-based approach provide data about energy usage but fail to evaluate the institutional and socioeconomic obstacles which limit energy security for lecturers. As a result, MEPI stands as the appropriate framework for analyzing lecturers' energy situation because it combines capability-based theory with energy deprivation understanding to analyse how various factors influence their access and stability.

3.2 Model Specification

This study adapted the model of Alkire et al., (2023) for measuring multidimensional energy poverty Index. Their method, although originally developed for poverty, is highly influential and adaptable to various indices, including those related to energy poverty. Therefore the MEPI is computed as follows:

$$MEPI = \sum_{i=1}^{n} E_i - NormalizedValue \quad \ldots\ldots 1$$

Where $E_i = ELEC + CD +$ LI

and ELEC = EA + EAFF+ERE

CD= MC +IP

Elec = Electricity characteristics, EA = Energy Access, EAFF = Energy Affordability, ERE = Energy reliability, CD = Cooking Dimension, MC= Modern Cooking, IP = Indoor air pollution, LI= Lightning Dimension.

The study also adapts the model of Manasi and Mukhopadhyay, (2024) to specify the regression model as follows:

$$MEPI = \beta_0 + \beta_1 \text{ Age} + \beta_2 \text{ Gender} + \beta_3 \ Householdsize + \beta_4 \text{ Marital status} + \beta_5 \text{ House ownership} + \beta_6 \text{ House hold heads} + \beta_7 \text{ Education} + \beta_8 \text{ Household income} + \beta_9 \text{Monthly expenditure} + et \quad \ldots\ldots 2$$

Different analytical techniques were employed to evaluate energy poverty levels and their determinants among university lecturers. The extent of energy poverty was based on descriptive statistics incorporating mean, median, mode, standard deviation and percentage distribution. These gave an overview of multidimensional energy poverty. The study builds a modified multidimensional energy poverty index to analyse the full extent of energy poverty in the selected population through measurements of energy access combined with affordability and reliability factors. The research also uses ordinary least squares (OLS) regression to study the determining factors of energy poverty. The MEPI analysis uses statistical methods to study

how different independent variables affect energy poverty assessment results based on income levels, family size, educational background, monthly expenditure and household income.
Due to the limitation of the OLS method in handling censored data, Tobit regression was also used for the robustness check of Equation 2. The dependent variable, Multidimensional Energy Poverty Index (MEPI) exists with a censoring structure which constrains its values between specific boundaries. The normal distribution requirement and lack of censoring handling within OLS regression methods may produce inaccurate and unreliable results when data is heavily clustered near the measurement boundary. Tobit provides a distinct handling of censored dependent variables because it recognises between exact variations in MEPI and measurement scale limitations. Tobit changes the threshold value treatment to improve OLS estimation precision. As a result, Tobit regression was used to correct this potential bias.

4. RESULTS AND DISCUSSION OF FINDINGS

The descriptive statistics of the respondents' results, the incidence and severity of energy poverty, and the energy poverty determinants are presented in this section.

4.1. Demographic Profile of Respondents:

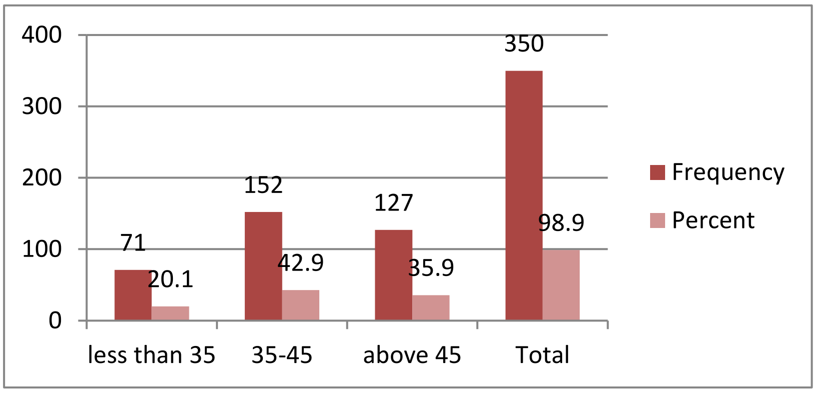
In this section, the frequency distribution and percentage of participants are presented based on their demographic characteristics. Particularly the demographic variables examined in the study include age, gender, marital status, education, religion, tribe, and house ownership. The demographic characteristics are displayed with the descriptive statistics in Table 1

Table 1: Descriptive Statistics

	Age	Gender	Marital status	position	household size	Religion	Tribe	House ownership
Valid	350	346	351	347	350	354	354	350
Missing	4	8	3	7	4	0	0	4
Mean	2.16	.75	2.81	2.71	2.21	1.87	1.15	1.53
Median	2.00	1.00	3.00	3.00	2.00	2.00	1.00	2.00
Mode	2	1	3	1	2	2	1	2
Std.Deviation	.736	.456	.547	1.451	.744	.369	.538	.500
Variance	.542	.208	.300	2.106	.553	.136	.290	.250
Skewness	-.261	-.853	-2.709	.381	.558	-1.505	4.046	-.138
Std.Error of Skewness	.130	.131	.130	.131	.130	.130	.130	.130
Kurtosis	-1.120	-.520	5.857	-.884	.322	2.464	16.379	-1.992
Std.Error of Kurtosis	.260	.261	.260	.261	.260	.259	.259	.260
Minimum	1	0	1	1	1	1	1	1
Maximum	3	2	3	6	4	3	4	2

Source: Authors' Field Work

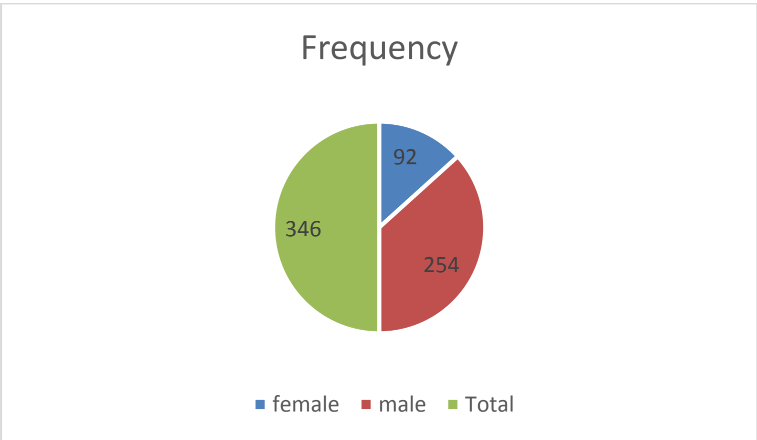
Figure 1: Age of Respondents



Source: Authors' Fieldwork, 2024

Figure 1 represents the age of respondents. The highest portion of the respondents was from age 35-45 (152), followed by age group above 40 (127) and age less than 35 (71).

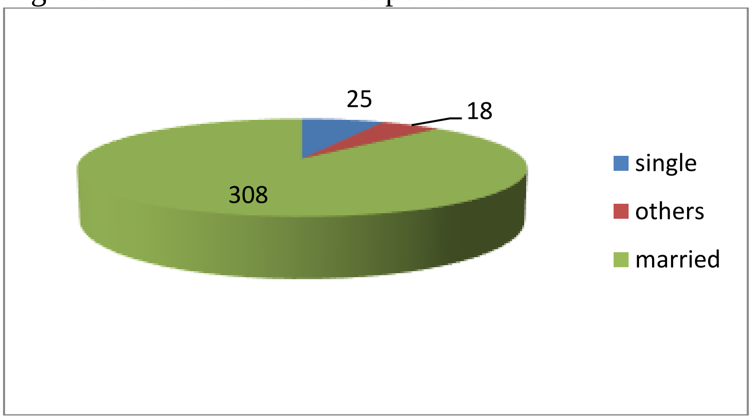
Figure 2 Gender of Respondents



Source: Authors' Fieldwork, 2024

Figure 2 represents the frequency distribution of respondents. Most of the respondents were males (254), while females constituted (92).

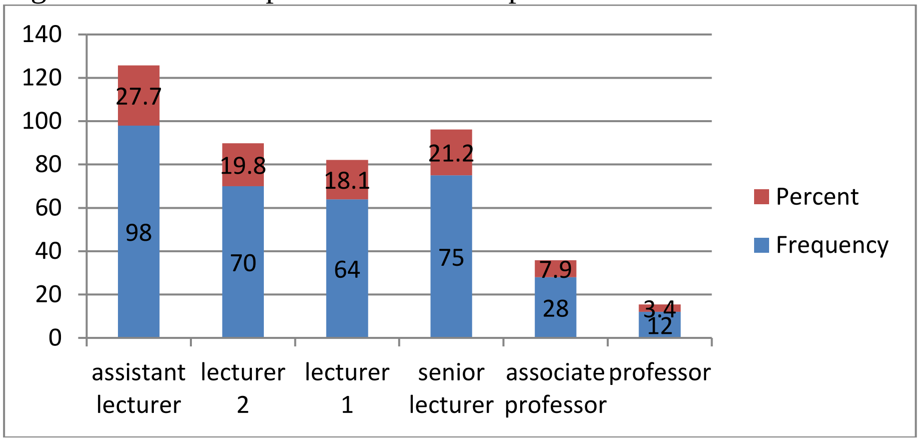
Figure 3 Marital status of Respondents



Source: Authors' fieldwork, 2024

Figure 3 represents the marital status of respondents. Of the total respondents, 308 were married lecturers, 25 were single, and 18 were others.

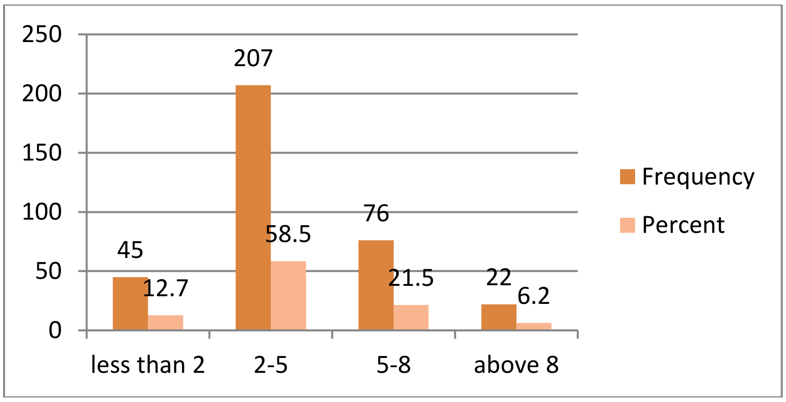
Figure 4: Academic positions of the respondents



Source: Authors' Fieldwork, 2024

Figure 4 represents the academic positions of respondents. Assistant lecturers made up the highest portion of respondents (98), while professors were the lowest (12).

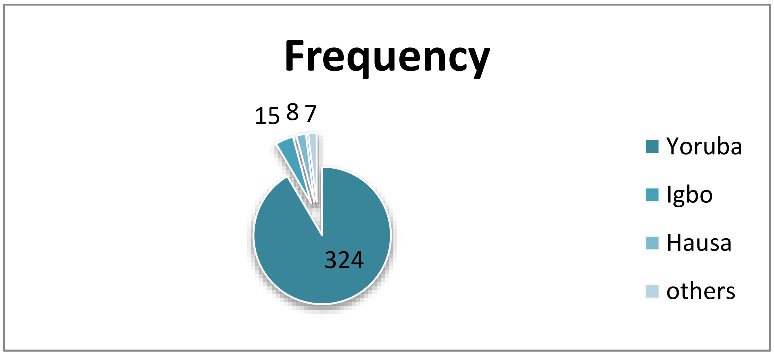
Figure 5: Household size of Respondents



Source: Authors' Fieldwork, 2024

Figure 5 represents the household size of the respondents. Most of the respondents have a 2-5 household size (207) and above 8 household size takes the least portion (22).

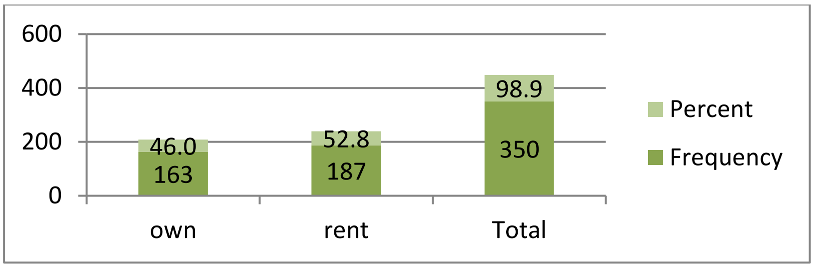
Figure 6: Tribe of Respondents



Source: Authors' Fieldwork, 2024

Figure 6 represents the tribe of the respondents, Yoruba constitute 324 of the respondents while Igbo take 15, and other tribes constitutes the least.

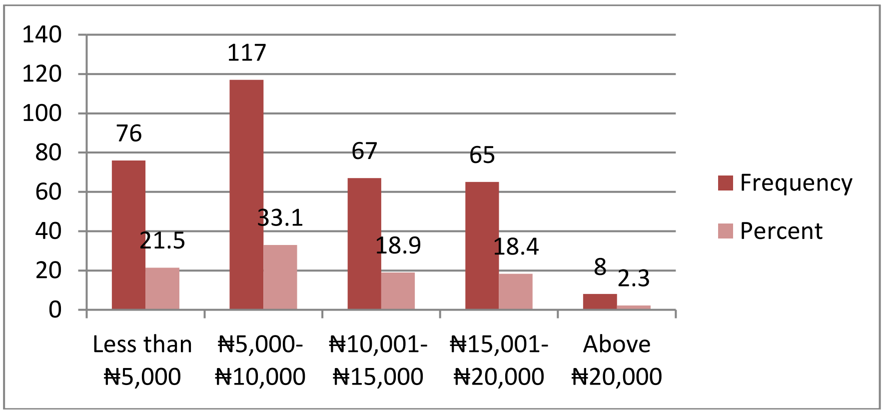
Figure 7: House ownership of Respondents



Source: Authors' Fieldwork, 2024

Figure 7 represents the house ownership of lecturers, The highest portion of lecturers rent houses (187), while a high portion also owns an apartment (163).

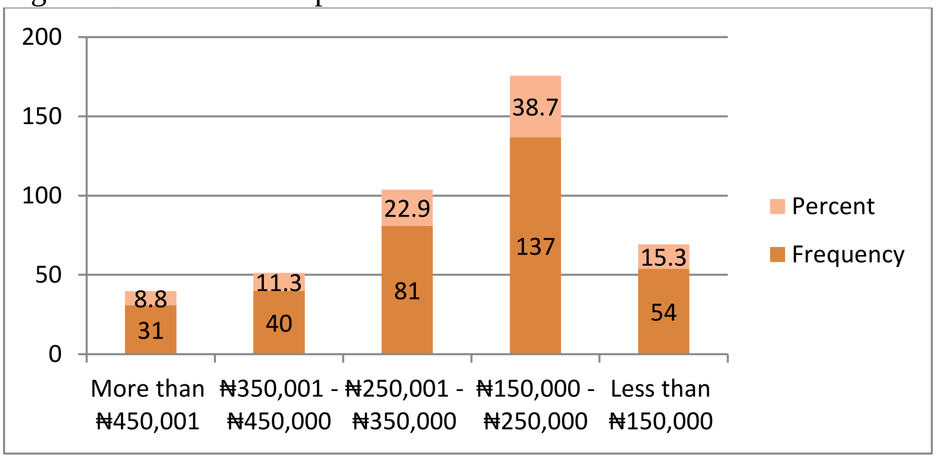
Figure 8: House ownership of Respondents



Source: Authors' Fieldwork, 2024

Figure 8 represents the respondent's expenditure on electricity. Most of the respondents spend ₦5,000- ₦10,000 (117) on electricity from the national grid, while the least of them spend above ₦20,000 (8) on electricity.

Figure 9: Income of Respondents



Source: Authors' Fieldwork, 2024

Figure 9 represents the respondent's monthly income. The highest portion of the respondents receive ₦150,000 - ₦250,000 (137).

4.3 Result of the Multidimensional Energy Poverty Index

The multidimensional energy poverty index (MEPI) was conducted to calculate the existence and severity of energy poverty among university lecturers. The MEPI value of university lecturers in Kwara state, Nigeria was calculated using equal weights estimated, this is represented in Table 2 as 3.1 on a 5 scale. The MEPI result shows a high level of energy poverty among the respondents. Electricity supply (ELEC) shows a high score of 3.0, this implies that university lecturers have limited access to affordable and reliable electricity supply in their various households. As far as the cooking dimension (CD) is concerned, results show a high figure of (2.9). This implies that most of the respondents use unclean cooking fuel (biomass). As regards lighting, the result revealed the highest score of (3.4), implying that most of the respondents do not comfortably enjoy the use of electrical appliances daily.

Table 2: Multidimensional Energy Poverty Index Result

S/N	Variable	Average Score
1	ELEC	3.0
2	CD	2.9
3	LI	3.4
4	MEPI	3.1

Source: Authors' Computation, 2024

4.4 Results on the Determinants of Energy Poverty

The overall R^2 of the study's model is presented in Table 3 revealing the model fit. From the table the R^2 value is 0.624, this implies that the model is fit.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.624[a]	.389	.225	.49724

Source: Authors' computation, 2024

The analysis of variance (ANOVA) presented in Table 4 assesses the overall significance of the regression model. The F-statistic, with a value of 2.371, demonstrates that the model provides a meaningful fit, explaining a significant portion of the variance in the dependent variable, energy poverty. Furthermore, the significance value (p = 0.022) falls below the standard threshold of 0.05, confirming that the regression model is statistically significant. This indicates that the independent variables collectively exert an influence on energy poverty.

Table 4: ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	6.448	11	0.586	2.371	0.022
Residual	10.137	41	0.247		
Total	16.585	52			

Source: Authors' Computation, 2024

4.5 Determinants of Energy Poverty Regression Results

The study adopts the OLS to test the factors that determine energy poverty. The results show that income, house ownership, age and gender significantly affect energy poverty, while expenditure, household size, religion and marital status are not significant. In this analysis, energy poverty results, are interpreted reversely, that is a positive value means a negative relationship and vice versa. As shown in Table 5 the result shows that income has the highest positive significant value to multidimensional energy poverty, this implies that the higher the income the lower the energy poverty level among university lecturers in Kwara state, Nigeria.

Similarly, house ownership (0.032) and gender (0.014) show that lecturers who own a house are less energy-poor, also lecturers who are of middle age (35-45) are likely to experience a higher rate of energy poverty. Gender also shows a positive significant effect on energy poverty, this implies that males are more likely to experience energy poverty than females. As for the other factors, expenditure, age, education, household size, religion, and marital status, they don't have a significant effect on energy poverty meaning, lecturers experience energy poverty regardless of these factors.

Table 5: Energy Poverty Regression Results

Parameters	Ordinary Least Square Result					Tobit Regression (SPSS Generalised Linear Model)				
MEPI	**B**	**Std. Error**	**Beta**	**T**	**Sig.**	**B**	**Std. Error**	**Wald Chi-Square**	**df**	**Sig.**
(Constant)	1.958	0.44		4.446	0	0.677	0.1861	13.246	1	0
Income	0.153	0.055	0.33	2.772	0.007**	0.044	0.0212	4.386	1	0.036**
Expenditure	-0.064	0.059	-0.135	-1.068	0.29	0.018	0.0145	1.581	1	0.209
House ownership	0.29	0.132	0.278	2.2	0.032**	0.07	0.0349	4.036	1	0.045**
Gender	0.348	0.137	0.294	2.536	0.014**	0.033	0.004	5.976	1	0**
Age	0.088	0.111	0.122	0.792	0.433	0.048	0.0238	3.976	1	0.046**
Education	0.026	0.073	0.068	0.361	0.72	0.019	0.0132	2.019	1	0.155
household size	0.088	0.111	0.119	0.795	0.431	.012	.0257	.201	1	.654
Religion	0.365	0.285	0.255	1.278	0.208	0.097	0.0806	1.458	1	0.227
Marital status	-0.05	0.138	-0.063	-0.361	0.72	-.043	.0382	1.2730	1	.259

Source: Authors' Computation, 2024

The Tobit regression result is also presented in Table 5. The result is almost identical with the OLS results except in a few cases. Income stands as a key independent variable (p=0.036) which demonstrates through its coefficient of 0.044 that greater income levels result in decreased energy poverty. People who earn more money possess the financial capability to secure better access to energy. The analysis shows that expenditure does not affect MEPI because its coefficient of 0.018 is not substantial enough to create a significant effect based on the p-value of 0.209.

According to this result, house ownership stands as a vital predictor of MEPI (p=0.045) because homeowners show decreased rates of energy poverty due to better access to reliable energy sources which is reflected in a coefficient value of 0.07. Gender plays a crucial role in determining energy poverty rates (p=0.000) through its coefficient value of 0.033 which shows that men and women face separate challenges due to differences in financial resources and domestic duties. The research also shows that Age is a significant factor in energy poverty with p-values of 0.046 and a coefficient of 0.048. However, the statistical analysis demonstrates that education (p=0.155), household size (p=0.654), religion (p=0.227) and marital status (p=0.259) do not significantly contribute to determining energy poverty within this particular group.

The study demonstrates that household income is directly linked to lower chances of energy poverty among university lecturers in both OLS and Tobin's results. This means that financial stability is crucial in ensuring steady access to energy resources. This result is in tandem with Manasi et al. (2024) and Abbas et al. (2020), who also suggest that wealthier houses negatively affect energy poverty. Also, house ownership significantly influences MEPI because homeowners experience increased stability for their energy access and reduced costs. This result is consistent with the findings of Abbas et al. (2020).

The Gender differences appear in energy poverty exposure as indicated in the research, meaning that men and women face the problem of energy poverty in unique ways. Moreover, the Tobit estimation showed stronger age effects than OLS, demonstrating that older participants tend to experience more energy poverty problems after considering censoring. This result is not surprising because it is consistent with the previous result of Abbas et al. (2020), where age and gender were also statistically significant. The variables of education, household size, religion, and marital status demonstrate minimal influence on MEPI.

5. CONCLUSION AND POLICY RECOMMENDATION

The study assesses the level of energy poverty and its determinants among university lecturers in Kwara State, Nigeria. The findings revealed that most academic staff are multi dimensionally energy poor. The results also shows that the major determinants of energy poverty among lecturers in Kwara State are income, house ownership, Age and gender due to their significant influence. Based on the results obtained from this study, the following recommendations are proposed to address the issue of energy poverty among university lecturers in Kwara State, Nigeria.

Policymakers should direct their energy poverty reduction efforts toward economic measures instead of general demographic-targeted approaches. The government and the University administrators should create specific income support programs which will provide lecturers with energy subsidies and interest-free loans for energy system investments such as solar power systems and inverters. The government should also support lecturers with homeownership schemes such as subsidized housing loans and rent-to-own programs to boost their energy security and stable electricity access. These specific methods will deliver better outcomes in fighting energy poverty than broad-based group categorisations.

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