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Global warming, ageing of population, reduction of energy consumption, immigration flows, optimization of land use, technological innovation

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Exploring the use of active mobility in selected rural areas of Nigeria

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Abstract
Recently, an increasing number of road users are turning to active transportation (AT) modes such as walking and cycling, viewing them as not the only means of mobility, but also opportunities for enhancing physical activity and improving health. However, while AT holds numerous benefits, its adoption and efficacy are influenced by complex environmental and social factors, particularly in rural areas. To investigate these dynamics, this study employed a robust research design, collecting primary data through a multi-stage sampling method. Specifically, 50% of the wards in the rural areas of Ondo State, Nigeria were randomly selected, and a total of 496 structured questionnaires were administered using a systematic sampling approach. Findings from our study revealed that majority of respondents in the rural areas were aged between 70 years and above, and mostly relied on the use of active mobility for trip making. Factors influencing the use of active travel showed distance as the most influential factor. This has a relative index of 0.993 and it is closely followed by travel time with a relative index of 0.984. this study proposed that residents in the rural areas should be sensitized on the benefits associated with active mobility, especially in relation to their health as majority are not aware of its health benefits.

Keywords
Rural areas; Active travel; Accessibility; Sustainable planning; Non-motorised transport.

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1. Introduction

Effective rural road infrastructure is essential for enhancing accessibility and driving socio-economic growth. In developing countries, poor transport access in rural areas hampers economic and social progress, worsening poverty levels. Addressing this requires improved transport infrastructure and services, focusing on facility location, quality, and affordability. Njenga et al. (2015) and Akpan & Morimoto (2022) emphasize that strong transport networks empower rural communities, enabling agricultural transport, access to healthcare, and political participation. The rural transport sector supports 'Sustainable Development Goals' (SDGs), providing socio-economic benefits globally. The World Bank (2017) estimates that in sub-Saharan Africa, around 70% of rural people—over 450 million—have limited access due to inadequate roads. Many roads are impassable during the rainy season (Aderibigbe & Gumbo, 2022). This, combined with poor public transport and low infrastructure maintenance capacity, creates significant challenges. Despite this, rural inhabitants adapt their travel behaviors, using available transport options. Active modes like walking and cycling are increasingly used across sub-Saharan Africa (Olawole, 2017), showing resilience in transportation constraints.

Nigeria's transport system heavily relies on roads, but the infrastructure is strained. Rural areas predominantly use active travel, yet vulnerable road users like cyclists and pedestrians face rising fatalities. Paradoxically, these groups lack access to motorized transport. Walking, though widespread, is overlooked in highway planning, especially in rural areas. Kaiser and Barstow (2022) highlight the rural transport ecosystem, which, though catering to basic mobility, presents challenges for pedestrians and cyclists. While walking has been extensively studied in developed countries (Ding et al., 2017; Kamargianni & Polydoropoulou, 2013; Nelson et al., 2008), it is under-researched in developing nations like Nigeria. This study fills that gap by examining active travel, non-motorized transport, and public transportation in rural areas lacking infrastructure. It explores the links between infrastructure and socio-economic factors like economics, agriculture, health, policy, gender, education, and environmental issues like climate change.

The study examined how differences in socio-economic and travel characteristics affect active mobility. It also identified key factors influencing active travel and assessed their impact on mobility choices. Moreover, the paper explores practical implementation aspects of infrastructure projects, such as road and bridge construction and maintenance. By addressing these issues, the research contributes to a comprehensive understanding of Nigeria's transportation dynamics and informs policy to enhance rural mobility and well-being. Mobility is crucial for well-being, as it fosters better quality of life by facilitating interaction between people and the environment, underscoring this article's relevance to land use, mobility, and environmental relationships. The article is divided into three sections: an introduction and literature review on rural transport and active mobility, a section on methodology, and a final section discussing findings with policy recommendations.

2. Literature review

2.1 General overview of rural transport

This section reviews relevant literature addressing the main objectives of the study. It is divided into sections covering the general concept of rural transport, rural transport accessibility, and factors influencing active transport. This will provide context from previous studies on rural transport and active mobility. Settlements in Nigeria range from rural to urban, with many in-between. Rural Nigeria refers to areas with fewer than 20,000 residents or larger areas where at least half the population farms and lacks basic amenities. Jibowo (2000) notes stronger social cohesion among rural dwellers compared to urban ones. Rural areas tend to have older populations, as younger individuals migrate to cities for jobs, education, or training. Vertical social mobility is more prevalent in urban areas, where opportunities for job advancement, education, marriage, and

relocation are more abundant. Urban centers also tend to be larger, with higher population densities. Recent research into rural transport planning in developing nations has shifted perceptions of rural transport's economic dynamics. Scholars such as Barwell (1996) and Oyeleye et al. (2013) stress that rural populations' primary deprivation is limited access to activities, thus, understanding this is vital for addressing rural transport Moseley (1979) proposed principles for assessing accessibility, offering solutions that include both transport and non-transport interventions. The framework of Moseley (1979), which includes mobility solutions and strategic service placement, serves as the cornerstone for contemporary efforts in rural accessibility planning across developing countries. It implies that mobility and the siting of services and infrastructure are key to defining rural accessibility. Moreover, studies by Carra et al. (2022), D'Amico (2023), and Stiuso (2024) emphasize the need for social inclusion and stakeholder participation as critical elements in promoting active mobility. Proper rural planning is essential to improve walkability and active living.

1.2 Concept of accessibility and rural transport

Accessibility encompasses individuals' perceptions of living conditions and ease of daily activities within a specific travel mode or lifestyle, often reliant on public transportation. Objective measures fail to account for contextual, climatic, and cultural factors or preferences for walking and cycling (Van Wee, 2016). Jamei et al. (2022) propose two perspectives for assessing accessibility: process indicators (travel opportunities) and outcome indicators (actual use and satisfaction). They argue that both aspects are essential for complete assessment. Scholars debate accessibility, focusing on time, cost, interaction opportunities, and travel modes (Dalvi & Martin, 1976; Curl et al., 2011). Curl et al. (2011) highlight the importance of perceived accessibility metrics in transportation planning, which reduce social exclusion and improve quality of life.

Morris et al. (1979) also considered process and outcome indicators, emphasizing their complementary roles in measuring accessibility. Dalvi and Martin (1976) stressed the importance of time and cost in activity access, while Hansen (1959) defined accessibility in terms of interaction opportunities. Jamei et al. (2022) noted the crucial role of perceived safety and service quality in public transport on daily travel accessibility, with social determinants revealing disparities among demographic groups, such as gender, age, income, occupation, and education. For instance, in Sweden, women perceive higher accessibility than men across certain travel modes (Lättman et al., 2018), although older women report lower perceived accessibility compared to men (Lättman et al., 2019).

Age is a key factor influencing perceived accessibility, but its impact is debated. Sundling et al. (2014) suggest older individuals with reduced mobility have lower perceived accessibility than younger counterparts. Aderibigbe et al. (2024) argued that built environments often hinder accessibility, especially for older populations. This reduced accessibility impacts their quality of life. However, retirees may perceive higher accessibility when urban services are available via public transportation. This is similar to active mobility in rural areas, where improved infrastructure for active travel would increase accessibility and mobility, improving rural dwellers' quality of life (Aderibigbe & Gumbo, 2022). Studies by Aboyeji & Aguda (2024), Roulet et al. (2024), and McHenry et al. (2023) attest to the positive impact of mobility on rural livelihoods through increased income and agricultural yield. Thus, there is a pressing need for transport services and infrastructure that enhance rural accessibility and quality of life.

1.3 Active / non-motorised travel in rural areas

Walking is the oldest, safest, and most accessible mode of transportation, requiring no technical expertise. Despite its advantages, many African countries lack adequate infrastructure for walking (Busari, 2019). Scholars such as Papa et al. (2018), Michel et al. (2024), Rainieri et al. (2024), and Mehriar et al. (2024) emphasize the environmental benefits of reducing car use and adopting active mobility, which releases little to no harmful emissions and promotes healthy living. Pedestrian trip distribution is significantly influenced by

land use, with Busari et al. (2015) highlighting the role of urban morphology and pedestrian networks. Stradling (2002) also identified factors such as school journeys that affect pedestrian trips.

In developing countries, rural transport infrastructure—roads, tracks, footpaths, and bridges essential for accessing farms, markets, schools, and clinics—often remains in poor condition year-round. Transport services are frequently inadequate and too expensive for rural residents. Consequently, in many regions, particularly in Sub-Saharan Africa, rural transport still relies heavily on walking and cycling. Access to essential services is measured in terms of time, effort, and cost, and depends on infrastructure availability and affordability, such as roads, schools, hospitals, and markets. The poor rural population often endures significant time and effort to access basic necessities, underlining the importance of enhancing accessibility to alleviate poverty. Efficient rural transport requires suitable infrastructure—paths, roads, bridges—and their maintenance.

Wachira et al. (2022) found that factors such as rural living, lower parental education, and vehicle ownership play a significant role in limiting active mobility use. Location and other factors heavily influence mobility choices. Aderibigbe & Gumbo (2022) also found that rural households depend primarily on active travel, such as walking and public transport, but lack infrastructure to support these modes in developing countries like Nigeria. Sustainable mobility and road safety must be prioritized, ensuring inclusive mobility for all. Key factors that encourage active travel include pedestrian infrastructure, distance, travel time, and safety (Wangzom et al., 2023; Olojede et al., 2017; Mejia, 2019; Ding et al., 2017).

Distance to school significantly affects transportation mode choice, especially for children and adolescents. Wangzom et al. (2023) found perceived distance to be a major barrier to active school travel. Kamargianni & Polydoropoulou (2013) revealed that travel time and costs impact transport behavior similarly in adolescents and adults. Additionally, availability of infrastructure like bicycle paths influences the preference for walking and cycling. Mitra & Ratkim (2013) supported the association between the built environment and active commuting. Mendiate et al. (2022) asserted that factors such as travel speed and paved roads influence active mobility, highlighting the need for good transportation infrastructure. Age also affects willingness to walk or cycle, with younger and older commuters more inclined to choose these modes (Ding et al., 2017). Factors influencing active mobility vary across age groups and locations, necessitating careful planning of built environments to support sustainable travel modes. Thus, there is a need for policies that address rural transport needs, particularly those that support active mobility, the dominant mode of transport in rural areas.

3. Materials and methods

3.1 Study area

Established on October 1, 1996, Akure North Local Government Area (Rural) is situated in Ondo State, Nigeria, with its headquarters located in the town of Iju/Itaogbolu. Covering an area of 660 km^2 (250 sq mi), it had a population of 131,587 according to the 2006 census. The region boasts fertile land conducive to agriculture, with farming being the predominant occupation. This agricultural focus characterizes the area as rural, with the majority of its inhabitants engaged in agricultural pursuits. Despite accessibility by road, certain communities within Akure North, such as Ilado and Moferere, face challenges during the rainy season due to flooded footbridges, hindering transportation.

It was discovered that the local government has no conventional mass transit system such and the residents only access major activities through the use of unregulated private taxis, keke napep (tri-cycles), motorbikes popularly known as Okada. The town's deficient transport infrastructure fails to accommodate active travel, with a stark absence of cyclist lanes and walkways. Compounding the issue, a significant portion of the city's population lacks personal vehicles, exacerbating the vulnerability of pedestrians and cyclists to road accidents. Based on the above, this study explored the factors and barriers which respondents face in the use of active mobility.

3.2 Sampling procedure

This research employed primary data derived from a survey conducted through trained research assistants utilizing a structured questionnaire. Employing a probability sampling technique, a multi-stage sampling procedure was implemented as adopted from the studies of Aderibigbe & Gumbo (2022) and Olawole (2013). Initially, residential areas were stratified into zones (core, transition, and periphery), followed by the random selection of registered streets, constituting 20% of the streets in selected wards. Subsequently, 10% of the 4968 registered buildings in the chosen wards were systematically sampled, resulting in a total of 496 buildings for further investigation. Within each selected building, the household head was chosen for questionnaire administration, consistent with prior studies justifying the focus on household heads due to their representative nature. In cases where the intended respondent was unavailable, the subsequent building was sampled. The criteria for selection ensured that household heads, aged 18 years or older, residing on the first floor of each building were included, culminating in a total of 496 respondents, of which 402 questionnaires (81%) were deemed analyzable.

The questionnaire utilized in this study consisted of three primary sections. The first section gathered socio-economic data from respondents, encompassing variables such as gender, age, education, income, marital status, employment status, occupation, household size, and car ownership. The second section delved into the travel behaviors of participants, capturing information on trip frequency, trip purposes (e.g., work, shopping, health, recreation), transport modalities, and associated travel costs. The final section focused on identifying factors influencing the adoption of active travel within the study area, thereby providing comprehensive insights into the socio-economic and behavioral determinants of transportation choices in the surveyed population.

Variables	Data Types and Description
Gender	Male, Female
Age	Age in Years
Marital status	Are you married, single, divorced
Income	Monthly Income earned by respondent
Occupation	What is the nature of your Job e.g. Farming, Civil servant
Education	What is your highest level of education? Primary school, Secondary/High School/ or Tertiary education
Cars in the Household	How many cars do you have in your family/household
Trip Frequency	What is the average number of daily round trips (completed)
Transport Mode	What is your dominant mode of transport for making trips
Trip purpose	What trip do you make more often on a daily basis? E.g. shopping trips: trips to commercial activities such as grocery shopping etc, Work trips: Trips to office or job related trips, School Trips: Trip for educational activities, Religious trips: Trips to church or mosque, etc
Travel Cost	What is the average cost you spent on your trip (in Naira)
Factors influencing active mobility use	What are the major factors you consider in using active travel, e.g travel cost, age, income level, safety among others

Tab.1 Data types and variables description (Source: Author's Field work 2023)

2.3 Model specification

The research data was analyzed utilizing percentages and the Relative Importance Index (RII) to gauge the influence of various factors impacting the decision to walk or not. Based on the study of Olojede et al, (2017), the likert scale method has been identified as one of the formulas for ranking factors in order of their relative importance, hence, its adoption in this study. Participants were tasked with rating the importance of each factor using the Likert Scale, ranging from 1 to 5 in ascending order of significance, from Very Low to Very High. These ratings were then converted into RIIs for each factor, mathematically expressed as follows:

$$RII = \frac{\sum W}{A * N} \quad (1)$$

Where W is the weighting given to each factor by the respondents to the survey (i = 1-5), 5 being the highest weight and N is the total number of respondents. A higher value of RII indicated a greater importance of the factor in influencing the decision to use active mobility (walking/cycling) by the respondents. The identified factors were ranked using the RII. This ranking facilitated the determination of the relative importance of the factors as perceived by the respondents. The RII of each factor as perceived by the respondents was used to assess the rankings of the factors that influenced the respondents' decision to use active mobility or not. This represents the mean for the factor identified in the study.

Additionally, to validate the result of the Likert scale. This study further employed the use of the multiple regression analysis in identifying and modelling factors influencing the use of active travel in the study area. The multiple regression model has been identified by scholars such as Kyeremeh & Fiagborlo (2016) and Ogunsanya (2002) for generating predictive models, hence, its adoption. The study examined the relationship between active travel behavior, specifically walking/cycling, and various determinants identified in existing literature, validated through this research using Relative Importance Index (RII). Participants reported the frequency of their active travel on a 5-point Likert scale, with scores aggregated to form a composite measure. Subsequently, categorical responses were converted into interval data. Regression analysis was employed to construct a model aimed at empirically elucidating the factors influencing the choice to walk or cycle to major destinations within the study area.

In this model, the mode (walk/cycle) was set as the outcome variable, and the demographic and trip characteristics as well as behavioural factors were entered as predictors/independent variables. The independent variables or predictors included: age, income, travel time, travel cost, availability of pedestrian facilities, safety, travel distance, avoidance of traffic congestion, healthy living and the number of cars available for the household.

A stepwise regression analysis was adopted to determine the factors influencing respondent's decision to walk/cycle. The formula is given as:

$$Y = a + b_1 x_1 + b_2 x_2 + \ldots\ldots\ldots + b_n x_n + e \quad (2)$$

Where Y represents the dependent variable. The dependent variables in this case represents Y= walking, x_1, x_2, x_3 ..... x_n represent the independent variables (age, income, travel time, travel cost, availability of pedestrian facilities, safety, travel distance, avoidance of traffic congestion, healthy living and the number of cars available for the household).

a, b : constants/slope of the regression line

e : error term

This represents the relationship between the average number of times respondents walk to their respective activities and other independent variables (predictors) or other factors as x_1, x_2, ... x_n. However, the

unstandardized coefficients was utilized in the model to explain the influence of each independent variables on the dependent variables.

3. Results

3.1 Socio-economic characteristics of respondents

The socio-economic profile of residents in Tab.2 is explained empirically using data obtained from the survey. This profile includes gender, age, marital status, educational attainment, income, occupation and number of cars in the household. The socio-economic characteristics of respondents revealed that the majority were not educated with 44.3% of the respondents in this category, while a greater proportion (46%) engaged in farming. Also, result on age distribution of respondents showed that majority (60.2%) of the aged who are 70 years and above resides in the rural areas of Nigeria. Research findings indicate that 44.5% of the participants reported earned below the federally approved minimum wage, indicating a prevalent low-income scenario among rural households. The proportion of government-employed respondents aligns with previous studies suggesting that individuals' educational attainment influences both their occupational choices and income levels (Ahn, 2001; Badiora, 2012; Stead & Marshall, 2001). Also, the retirement age of 60 years in Nigeria makes it impossible for the elderly to still be actively engage in government jobs/activities. The availability of cars for a household is a function of the income earned by the household. It is thus given that household with higher income will be able to afford cars to ease its movement. It is clearly evident from our study that more than half (55.7%) of the respondents do not own a car while 25.4% of them own one car. The mean age for this study is 68, while average income is 21,008.

Characteristics	Variable	Frequency	Percent
Gender	Male	176	43.8
	Female	226	56.2
Age	Less than 30 years	24	6.0
	30-39	22	5.5
	40-49	25	6.2
	50-59	33	8.2
	60-69	56	13.9
	70 years-above	242	60.2
Educational status	No formal Education	178	44.3
	Primary Education	113	28.1
	Secondary Education	50	12.4
	Tertiary Education	61	15.2
Marital status	Single	44	11.0
	Married	108	26.9
	Widowed	208	51.7
	Divorced	42	10.4
Occupation	Civil servant	68	17.0
	Farming	185	46.0
	Artisan/Self employed	57	14.2
	Unemployed/Retiree	92	22.8
Income of respondents (Naira)	<20,000	179	44.5
	20,000-39,999	67	16.7
	40,000-59,999	52	13.0
	60,000-79,999	45	11.2
	80,000-99,999	26	6.4
	100,000-above	33	8.2
Number of cars in the household	None	224	55.7
	1	102	25.4
	2	50	12.4
	3-above	26	6.5

Tab.2 Socio-economic characteristics of respondents (Source: Field Survey 2023)

3.2 Travel characteristics of respondents

Analysis of trip frequency of respondents in table 3 showed that 50.8% made an average of 2 round daily trips. Trips for agricultural related activities comprised the majority (31.3%) of trips while 19.4% of them made work trips. Overall, the trip purpose of respondents showed that majority of households 69.2% made more of discretionary trips against the 30.8% of their counterparts who made more of non-discretionary trips. The findings on the dominant transport mode of respondents revealed that walking and cycling were more phenomenon as 31% and 26.9% of the respondents respectively utilized this mode of transport. The travel cost of households revealed that trips to health facilities accounted for the largest expenditure, with respondents averaging 7,500 naira on this activity. They often travel outside their neighborhoods to specialist hospitals in neighboring towns such as Akure and Owo for quality healthcare services, as many rural health facilities are smaller centers with limited staffing. Following closely is the cost of trips to educational facilities, with an average spending of 4,800 naira. This is attributed to students attending schools outside their districts in pursuit of better education quality. Trips for recreation incurred the least expenditure, averaging 400 naira, as only a few residents visit recreational centers beyond their immediate neighborhoods.

Characteristics	Variable (in number)	Frequency	Percent
Average number of daily round trip	1	102	25.4
	2	178	44.3
	3	65	16.1
	4	34	8.5
	5-above	23	5.7
Dominant trip purpose	Work	78	19.4
	School	46	11.4
	Agricultural Activities	126	31.3
	Health/Medical	69	17.2
	Shopping	51	12.7
	Others (recreational, religious etc)	32	8
Dominant transport mode	Walking	125	31.0
	Cycling	108	26.9
	Public Transport	75	18.7
	Private Vehicle	39	9.7
	Others (Motorcycle, Keke)	55	13.7
Average cost of making trips to the following places (N)/week	Work	1,500	
	School	4,800	
	Agricultural Activities	800	
	Health/Medical	7,500	
	Shopping	700	
	Others (recreational, religious etc)	400	

Tab.3 Travel characteristics of respondents (Source: Field Survey 2023)

3.3 Analysis of factors influencing active travel in the study areas

In the final phase of the study, an examination was conducted to evaluate the determinants affecting mode selection (specifically, active travel) among participants. Utilizing both Likert scale ratings and stepwise multiple regression analysis, the study aimed to identify the impact of various factors, including individual and household attributes, as well as trip-specific characteristics, on the adoption of non-motorized transportation and active mobility. Mode preferences for the primary purpose of trips were assessed through stepwise regression modeling, allowing for a comprehensive analysis of influential factors in mode choice.

The findings of this study as presented in Tab.4 showed that distance was the most influential factor influencing the use of active travel in the study areas. This has a relative index of 0.993 and it is closely followed by travel time with a relative index of 0.984. Next to this are income level of respondents, travel cost, availability of pedestrian facilities, availability of private vehicle, age, and healthy living. Their relative index are 0.978, 0.933, 0.931, 0.878, 0.842 and 0.769 respectively. The least factors influencing respondent's

decision to walk/cycle rather than use another mode with relative index of 0.724 and 0.706 respectively are safety and avoidance of traffic congestion. It was also revealed from this study that health benefits associated with walking has not been fully explored by the respondents as majority of them who walk are not fully aware of the benefits associated with active mobility, hence ranked 8. Likewise, safety and traffic congestion were not significant at influencing the decision of people to walk in the rural areas as they ranked 9 and 10 on the relative index list.

S/N	Factors	N	A*N	SW	RII	Rank
1	Travel cost	402	2010	1,876	0.933	4
2	Age	398	1,990	1,676	0.842	7
3	Income level	400	2,000	1,957	0.978	3
4	Healthy living	402	2,010	1,546	0.769	8
5	Safety	402	2,010	1,456	0.724	9
6	Travel time	402	2,010	1,978	0.984	2
7	Distance	402	2,010	1,997	0.993	1
8	Availability of pedestrian facilities	401	2,005	1,867	0.931	5
9	Private car availability	402	2,010	1,765	0.878	6
10	Avoidance of traffic congestion	396	1,980	1,399	0.706	10

Tab.4 RII index table for factors influencing the decision to use active mode (Source: Author's Field Survey)

3.4 Model predictors for active travel in the rural areas of Nigeria

The stepwise regression was used to enter the predictors and out of the 10 predictors determining walking/cycling in the study areas, six (6) variables were significant while the remaining four were excluded as they were found insignificant. The significant variables are: Age; Travel distance; Income of respondents; Travel cost; Number of cars in the household and Safety. As presented in Tab.5, age was found to be the strongest predictor of household and household to walk, with R and R^2 values of 0.692 and 0.515, respectively ($p < 0.005$). This implies that over 50% of the variability in walking could be explained by age. Further, the addition of travel distance and income increased the R^2 value to 0.578 and 0.612 respectively, implying that both travel distance and income explain about 57.8% and 61.2% of the total variation in the decision of the respondents to walk. In the same way, travel costs, number of cars in the household and safety increased the R^2 value to 67.9%, 70.1% and 74.2% respectively, Overall, the predictors retained in the model explained as much as 74.2% of the total variation in the decision of the respondents to walk rather than use any other mode of transport.

S/N	Factor	Beta	R	R^2	F Ratio	Sig
1	Age	-0.385	0.692	0.515	18.654	0.002
2	Travel Distance	-0.176	0.731	0.578	16.456	0.000
3	Income	0.247	0.786	0.612	12.356	0.010
4	Travel cost	0.412	0.809	0.679	10.412	0.003
5	Number of Cars	-0.256	0.823	0.701	9.764	0.012
6	Safety	0.192	0.892	0.742	5.987	0.007

Tab.5 Regression Coefficient for Factors Influencing the Use of Active Travel (Walking/Cycling) *Constant = 2.105 (Source: Author's field work)

The coefficients of the six predictors are -0.385, -0.176, 0.247, 0.412, -0.256 and 0.192 respectively, while the constant as obtained in the regression analysis was 2.105. Consequently, a regression equation/model was developed

$y = 2.105 - 0.385\ (age) - 0.176\ (travel\ distance) + 0.247\ (income) + 0.412\ (travel\ cost) - 0.256\ (number\ of\ cars) + 0.192\ (safety) + \varepsilon$

where y = walking, x_1 = age, x_2 = travel distance, x_3 = income, x_4 = travel costs, x_5 = number of cars, x_6 safety and ε = error term. Highlight of the model is that a unit increase in age, travel distance and number of cars by 0.385, 0.176 and 0.256 respectively will reduce the propensity of an individual or a household to use active travel while a unit increase in income, travel cost and safety measures by 0.247, 0.412 and 0.192 respectively will increase the use of active mode by the respondents. The combined influence of the six significant variables at influencing the decision to use active travel in the rural area accounted for 74.2%, this implies that the coefficient of determination (R^2) is 74.2%.

4. Discussion

This paper explored the potential for rural dwellers in selected Nigerian villages to adopt active mobility. A key finding was that most respondents were senior citizens, aged 70 and above, which aligns with studies by Olawole (2015) and Wachira et al. (2022), indicating that the elderly predominantly reside in rural areas. This is due to younger populations moving to urban areas for job opportunities. Household income levels were also low, supporting claims by Odozi & Oyelere (2019) and Zhang et al. (2022) that poverty is prevalent in rural areas. Car ownership was low compared to urban centers, consistent with studies (Odozi et al., 2021; Giuliano, 2003; Aderibigbe & Gumbo, 2022) showing lower car ownership in rural, low-income households.

Regarding travel habits, most rural residents made discretionary trips, likely because many are retired, which aligns with Oyeleye (2013) that rural trips are often discretionary, particularly for agriculture. However, findings contradicted Pucher & Renne (2005), who suggested U.S. rural households rely more on private vehicles. This difference reflects disparities in socio-economic status and policy support between developed and developing countries.

The study also found that factors like distance, cost, income, and travel time influence the decision to walk, corroborating Emond & Handy (2011) and others. Safety and traffic concerns were ranked low as factors, as rural areas in Nigeria are generally secure with little traffic congestion. This contradicts Mejia (2019) and Potoglou et al. (2017), who emphasized safety in active travel, possibly due to cultural differences across countries. Overall, the study highlights the significant role of socio-economic and travel factors in influencing active mobility decisions. Similar to Ding et al. (2017), younger travelers, being healthier, are more likely to walk, whereas older individuals with frail health are less inclined to use active modes of transport. This aligns with studies by Mejia (2019), Harrison et al. (2007), and Mendes de Leon et al. (2009), which identified age, income, and distance as key influences.

5. Conclusion and recommendations

This study investigated the decision-making process and adoption of active mobility within rural areas of Nigeria, focusing particularly on Akure. The findings are timely, offering insights crucial for stakeholders aiming to implement policies enhancing active travel in rural regions. Identified influential factors affecting walking as a primary mode of active travel include age, income, travel expenses, distance, safety, car availability, health considerations, avoidance of traffic congestion, and travel duration. Notably, the study revealed a glaring lack of investment in transport infrastructure supporting active travel, with inadequate provision for

amenities such as bicycle lanes and pedestrian walkways. Consequently, many individuals opt for private automobiles overactive modes of transportation. Despite awareness of the health benefits associated with active mobility, this knowledge does not significantly influence the decision to walk. Therefore, public awareness campaigns are essential to educate residents about the advantages of active travel, while government agencies must integrate active travel facilities into urban transport infrastructure.

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