VOL. 10 NO. 2,
NOVEMBER, 2025
E-ISSN 3027-1533
P-ISSN 3026-8648

African Scholar Publications & Research International
www.africanscholarpub.com

Journal of African Innovation & Advanced Studies (JAIAS)

Investigation of Risk Perception and Travel Behavior of Commercial Motorcycle (Okada) Riders in Metropolitan Lagos

Fatai A Yakeen; & Rafiu O. Olorunnimbe
School of Transport and Logistics, Lagos State University, Nigeria
Corresponding Author: fatai.yakeen@lasu.edu.ng
DOI: https://doi.org/10.70382/ajaias.v10i2.063

Abstract

This study investigates the risk perception and travel behavior of commercial motorcycle (Okada) riders in Lagos, Nigeria. Given the critical role Commercial motorcycles (Okada) play in urban mobility amidst Lagos's chronic traffic congestion, the research highlights growing concerns over their contribution to road traffic injuries and fatalities. Using a cross sectional survey design, data were collected from 300 Okada riders through structured questionnaires, interviews, and field observations. The findings reveal that while riders acknowledge the risks associated with their occupation, particularly during night-time operations, economic necessity and social norms often compel them to engage in unsafe travel behaviors. Risk perception was found to significantly influence decisions regarding safety compliance, frequency of operations, route choices, and the use of protective gear. Demographic factors such as age, education level, and experience also shaped riders' attitudes towards safety. Notably, 40% of respondents operated without a valid rider's card, indicating regulatory lapses. Policy recommendations include enhanced safety awareness campaigns, rider training programs, stricter regulatory enforcement, infrastructure improvements, and community-based engagement strategies. The study advocates for a holistic approach to improving motorcycle transport safety in Lagos, thereby contributing to sustainable urban mobility and public health goals.

Keywords: Road Safety, Risk Perception, Travel Behaviour, Commercial Motorcycle (Okada), Lagos

Introduction

Commercial motorcycles, commonly known as "Okada," have become a significant mode of transportation in many urban areas, particularly in Lagos, Nigeria. Their popularity stems from their ability to navigate traffic congestion quickly and provide an affordable means of transportation for commuters. However, despite their advantages, Okada operations pose substantial risks to riders, passengers, and other road users due to factors such as poor road infrastructure, reckless riding behaviors, and inadequate safety measures (Obadeji et al., 2020).

Lagos, known for its dense population and chaotic traffic conditions, has one of the highest rates of road traffic fatalities globally, with motorcycles accounting for a significant proportion of these accidents (WHO, 2018). Road traffic injuries remain the leading cause of death among young adults aged 15–35, with two-wheeled vehicles experiencing particularly high fatality rates. The risk associated with Okada travel is further heightened by economic pressures, regulatory challenges, and limited enforcement of safety regulations.

The travel behavior of Okada riders is influenced by their perception of risk. Factors such as economic considerations, cultural influences, experience levels, and regulatory constraints shape their decision-making processes. Many riders face a trade-off between maximizing their earnings and ensuring safety, leading to behaviors such as overloading, neglecting protective gear, and disobeying traffic regulations. Understanding how risk perception affects Okada riders' travel behavior is essential for developing effective road safety strategies and transportation policies (Jensupakarn & Kanitpong, 2018; Satiennam et al., 2018).

The COVID-19 pandemic significantly altered urban commuters' risk calculus, with many prioritizing "controlled risk" environments that minimize exposure to crowded, enclosed spaces (Asenime et al., 2021). Saladié and Santos-Lacueva (2022) found that in cities like Lagos, where public transport systems are often congested, commuters increasingly viewed open-air modes such as commercial motorcycles (Okada) as safer alternatives to buses or shared taxis, despite their higher accident risks. This shift reflects a trade-off between pandemic-related health concerns and traditional road safety hazards, reinforcing how acute risk perceptions (e.g., disease transmission) can override chronic risks (e.g., traffic accidents). For Okada riders, this trend translated to heightened demand, further entrenching their role in Lagos' transport ecosystem even as riders grappled with the dual pressures of economic necessity and safety compliance.

The commercial motorcycle industry in Lagos, particularly in the Iyana Iba–Mile 2 corridor, plays a vital role in urban mobility, facilitating the daily transit of thousands of commuters. However, this mode of transportation is characterized by a high incidence of accidents, injuries, and fatalities, raising concerns about its safety. Despite growing awareness of the risks associated with Okada operations, many riders continue to engage in unsafe practices, influenced by economic pressures and social norms. This study seeks to investigate the influence of

risk perception on the travel behavior of Okada riders in Lagos, exploring how their awareness of risk affects decision-making, adherence to safety measures, and overall travel patterns. By examining these factors, the study aims to provide insights that can inform policies aimed at improving road safety and reducing the high rate of motorcycle-related accidents in metropolitan Lagos.

This study is significant for multiple reasons. Firstly, it contributes to the body of knowledge on transportation safety by providing empirical insights into the travel behavior of Okada riders in Lagos. Secondly, the findings can guide policymakers in designing targeted interventions, such as awareness campaigns and stricter enforcement of safety regulations. Finally, the study can serve as a foundation for future research on risk perception and motorcycle transportation safety in other urban contexts.

Risk Perception

Risk perception refers to an individual's subjective evaluation of the potential hazards associated with an activity or behavior. In the context of commercial motorcycle transportation in Lagos, risk perception encompasses concerns about road safety, accidents, regulatory enforcement, and economic implications. The study of risk perception is crucial as it influences how Okada riders make travel-related decisions, including adherence to safety measures, route selection, and speed control (Bi et. al., 2023).

Scholars have identified various dimensions of risk perception that affect Okada riders. These include cognitive risk perception, which involves rational assessments based on facts and statistics (Slovic et. al., 2013), and affective risk perception, which is shaped by emotions such as fear and anxiety (Bae & Chang, 2020; Bae & Chang, 2023)). Other dimensions include social and cultural risk perception, where societal norms and peer influence play a role in shaping individuals' views on safety (Geber et. al., 2021), and media-driven risk perception, which is influenced by how risks are reported and framed by the media (Holman et al., 2020). These factors collectively determine the travel behavior of motorcycle riders in Lagos.

Risk perception plays a crucial role in shaping the travel behavior of commercial motorcycle riders. Commuters' mode choices are directly influenced by their assessment of risk; those who perceive motorcycles as high-risk may opt for alternative transportation, while others may prioritize the convenience and affordability of motorcycles despite safety concerns. Additionally, riders who are more risk-averse tend to adopt stricter safety precautions, such as wearing helmets, adhering to traffic laws, and using protective gear. Experience level further differentiates risk perception, with novice riders often exhibiting different risk assessments and riding behaviors compared to their more experienced counterparts. Finally, regulatory measures, including helmet laws and traffic regulations, significantly shape riders' perceptions of risk and their compliance with safety protocols. Together, these factors underscore the complex interplay between risk perception and travel behavior among motorcycle riders.

The relationship between risk perception and travel behavior is multifaceted, as riders make trade-offs between economic benefits and safety concerns (Sönmez & Graefe, 1998). Studies

suggest that while awareness of risk is high among Okada riders, adherence to safety measures remains inconsistent due to economic pressures and inadequate enforcement (Akinbode et al., 2019).

Risk Perception among Commercial Motorcycle Riders in Lagos

Several studies have examined the risk perception of Okada riders in Lagos. Research by Okoye et al. (2018) indicates that most riders acknowledge the dangers associated with their occupation, including frequent accidents and injuries. However, economic necessity often overrides safety concerns, leading to risk-taking behaviors such as overloading and reckless riding.

The study by Adeola and Evans (2023) reveals a critical gap in risk perception among commercial motorcycle (Okada) riders in Lagos, particularly concerning flood-related hazards. Despite the well-documented dangers posed by flooding, such as road washouts, reduced visibility, and increased accident risks, many riders continue operating during heavy rains and floods due to pressing economic needs. The authors attribute this behavior to "income urgency," where the immediate financial pressure to earn a daily wage outweighs long-term safety considerations. This aligns with Prospect Theory (Kahneman & Tversky, 1979; Yakeen & Laird, 2014), as riders prioritize short-term gains over potential losses, even when faced with life-threatening conditions. Adeola and Evans (2023) further note that inexperienced riders and those with lower education levels are disproportionately likely to underestimate flood risks, exacerbating their vulnerability. These findings underscore the need for targeted awareness campaigns that address both environmental hazards and the socioeconomic drivers of risk-taking behavior.

A study by Adiele and Ndife (2013) found that high-risk perception among Okada riders can act as a deterrent, causing them to avoid dangerous routes or peak traffic periods. Similarly, Lawal and Adeolu (2016) observed that riders with a heightened awareness of road dangers were more likely to engage in defensive driving techniques. These findings underscore the complex relationship between risk perception and travel decisions.

The Protection Motivation Theory (PMT) (Rogers, 1975) offers a theoretical lens to understand how Okada riders assess and respond to risks. This theory suggests that individuals evaluate risks based on perceived severity, vulnerability, and coping mechanisms. Studies in Lagos have shown that riders who perceive accidents as severe but feel powerless to mitigate them often engage in fatalistic thinking, which reduces their likelihood of adopting safety measures (Oluwaseyi et al., 2019).

Factors Influencing Risk Perception

The risk perception of Okada riders is influenced by a combination of demographic, sociocultural, institutional, and environmental factors. Younger and less experienced riders tend to underestimate operational risks, while their older, more experienced counterparts develop more accurate risk assessments due to prolonged exposure (Afolayan et al., 2016).

Cultural norms also play a significant role, as traditional associations between masculinity and risk-taking behavior often encourage dangerous riding practices among commercial motorcyclists (Okoye et al., 2018). Regulatory frameworks, including helmet laws and safety campaigns, shape risk perception through enforcement mechanisms, with the Theory of Planned Behavior (Ajzen, 1991; Yakeen 2020, 2024) explaining how riders' attitudes, social norms, and perceived control affect their compliance. Media representation further modulates risk awareness, where exaggerated accident reports may amplify perceived dangers while insufficient coverage of safety initiatives can foster complacency (Garfin et al., 2020). Additionally, physical infrastructure deficiencies, such as poor road conditions and inadequate lighting, directly elevate riders' risk perception, influencing their route selection and overall riding behavior (Akinbode et al., 2018). These interconnected factors collectively determine how Okada riders perceive and respond to occupational hazards.

A study by Aderamo (2016) found a negative relationship between risk perception and motorcycle usage frequency, riders who perceive higher risks tend to use commercial motorcycles less frequently. However, economic necessity often compels them to continue riding despite recognizing the dangers.

Effect of Risk Perception on Safety Measures

Risk perception plays a crucial role in determining adherence to safety protocols. Studies suggest that Okada riders with higher risk awareness are more likely to wear helmets, obey traffic laws, and avoid risky maneuvers. For example, Oluwamakinde et al. (2017) found a strong correlation between risk perception and helmet usage among commercial motorcyclists in Lagos.

The Extended Parallel Process Model (EPPM) (Witte, 1992) explains how individuals react to safety risks. Riders who believe that safety measures are effective and within their control are more likely to adopt them. Conversely, those who perceive external factors (e.g., road conditions or enforcement lapses) as the primary risks may feel helpless and ignore safety precautions (Ibe et al., 2020).

Impact of Risk Perception on Travel Behavior

Risk perception refers to individuals' subjective evaluation of potential hazards and plays a crucial role in shaping travel decisions. In the context of commercial motorcycle operations, riders' risk perception influences their attitudes toward safety measures, road conditions, and compliance with regulations (Oluwaseyi et al., 2019). Prior research indicates that risk perception varies among individuals based on factors such as age, gender, experience, and socioeconomic status (Girlando et. al., 2021). However, there is limited research on how risk perception specifically affects Okada riders' travel behavior in Lagos.

Risk perception influences critical aspects of travel behavior, including route selection, adherence to traffic laws, and use of protective equipment. The interplay between perceived risk and travel behavior has implications for both individual safety and the broader

transportation system. Understanding this relationship is vital for policymakers, transport authorities, and urban planners seeking to improve road safety and optimize the regulation of commercial motorcycle operations in Lagos.

Risk perception significantly shapes the travel behaviors of commercial motorcycle riders, particularly in their route selection, speed management, and scheduling decisions. Riders with heightened risk awareness tend to avoid congested or accident-prone roads, opting instead for safer alternatives (Fagbayide et al., 2020). Similarly, those who perceive excessive speed as hazardous demonstrate greater compliance with speed limits, adjusting their riding patterns accordingly. Temporal considerations also come into play, as many riders deliberately avoid peak traffic hours or nighttime operations when risk perception is elevated due to factors like reduced visibility and increased traffic density. These behavioral adaptations underscore how risk assessment directly influences operational decisions in commercial motorcycle transportation, with safety-conscious riders modifying their practices to mitigate perceived dangers. The findings highlight the importance of incorporating risk perception insights when developing targeted road safety interventions for motorcycle operators. A study by Adeyemi et al. (2017) in Lagos found that Okada riders who perceive greater risks are more likely to adopt cautious travel behaviors, such as defensive driving and reduced speed.

The Prospect Theory (Kahneman & Tversky, 1979) provides further insight, suggesting that riders assess risks based on perceived gains and losses. In the context of Okada transport, economic benefits (such as faster trip times) may sometimes outweigh safety concerns, leading to riskier behaviors.

Theoretical Framework

This study employs two fundamental theoretical frameworks to analyze Okada riders' decision-making processes and behaviors. The Theory of Planned Behavior (TPB) (Ajzen, 1985) provides a foundational understanding of how riders' compliance with safety regulations is determined by three key factors: their personal attitudes toward risk, the influence of social norms within their peer groups, and their perceived ability to control safety outcomes. Complementing this, Prospect Theory (Kahneman & Tversky, 1979; Yakeen & Laird, 2014) offers crucial insights into the economic dimensions of risk assessment, explaining how riders engage in cost-benefit analyses that prioritize immediate financial gains over potential safety risks. Together, these theories create a comprehensive framework for understanding the complex interplay between psychological, social, and economic factors that shape Okada riders' safety behaviors and risk management strategies. The TPB helps explain the social and attitudinal drivers of behavior, while Prospect Theory elucidates the economic calculations underlying riders' risk-taking decisions, providing a robust theoretical foundation for examining the study's key findings.

By integrating these theoretical perspectives, this study aims to provide a comprehensive understanding of how risk perception influences the travel behavior of commercial motorcycle riders in Lagos.

Existing literature highlights the significant role of risk perception in shaping the travel behavior of Okada riders in Lagos. While riders acknowledge the risks associated with their occupation, economic constraints and regulatory lapses often lead to unsafe riding practices. Factors such as demographic characteristics, social norms, and government policies influence risk perception, which in turn affects adherence to safety measures and overall travel behavior. By building upon established theories such as the TPB and Prospect Theory, this study seeks to offer valuable insights into how policymakers and transportation authorities can develop targeted interventions to enhance road safety in Lagos.

Research Design

This study employs a cross-sectional survey design to examine the influence of risk perception on the travel behavior of commercial motorcycle (Okada) riders in Lagos. A survey research design is appropriate for capturing respondents' behaviors, opinions, beliefs, and attitudes in a systematic manner (Cooper & Schindler, 2008). This approach helps establish the current status of the population under study and ensures reliability in data collection (Mugenda & Mugenda, 2004).

Study Population

The population of this study consists of commercial motorcycle (Okada) riders operating within the Iyana Iba–Mile 2 corridor in Ojo, Lagos. This area is characterized by heavy traffic congestion and a high reliance on commercial motorcycles for transportation. The study targets Okada riders from diverse social and economic backgrounds to ensure a heterogeneous sample.

The research is conducted in the Iyana Iba–Mile 2 corridor, located in Ojo, Lagos, Nigeria. Ojo is a densely populated urban area known for its commercial activities and heavy reliance on motorcycle transportation. The Lagos State University is situated within this area, contributing to significant commuter movement. Given the high traffic congestion and prevalence of Okada operations, this location provides a relevant setting for investigating the relationship between risk perception and travel behavior.

Sample Size Determination

Sample size refers to the number of participants or observations included in a study. This number is usually represented by n. Using the Taro Yamane formula for determining sample size

n = N/1+N(e)?

Where n is the sample size required

N is the number of populations

e is the margin of error

n= 600/ (1+600(0.05)2)

n= 600/ (1+ 600(0.0025)

n= 600 (1+1)
n= 600/2
n= 300.
Thus, **300 respondents** will be sampled for this study.

Sources of Data

The study employed both primary and secondary data sources to ensure comprehensive analysis. Primary data collection involved administration of questionnaires to Okada riders to gather standardized responses about their risk perceptions and behaviors; in-depth interviews with selected participants to obtain richer qualitative insights; and field observations to document real-time riding behaviors in natural settings. These primary sources were complemented by extensive secondary data, including peer-reviewed academic literature, textbooks, government policy reports, and relevant online resources. This dual approach of primary and secondary data collection allowed for triangulation of findings, enhancing the study's validity and reliability while offering both micro-level behavioral insights and macro-level industry perspectives.

Sampling Technique

Given the large population of Okada riders, a non-probability convenience sampling technique was used. This method allowed for the selection of respondents who are readily available and willing to participate in the study. Convenience sampling is appropriate for studies with difficult-to-access populations and ensures quick and cost-effective data collection (Rahman & Okunbanjo, 2017).

Data Collection and Analysis

The study employed structured questionnaires designed with a combination of closed-ended and open-ended questions to capture both quantitative and qualitative insights. This survey instrument was organized into four thematic sections to investigate critical aspects of Okada operations. The first section gathered essential demographic information about respondents, establishing important contextual characteristics of the rider population. The second section focused on assessing riders' perceptions of various risks associated with their occupation, probing their awareness and evaluation of potential hazards. The third section examined actual travel behaviors, including route choices, operating hours, and riding patterns. Finally, the fourth section evaluated compliance with safety measures, particularly helmet usage and adherence to traffic regulations. This multi-dimensional approach allowed for a holistic understanding of the complex relationship between risk perception and riding behavior, while the inclusion of both closed and open response formats enabled the collection of standardized data for statistical analysis alongside richer narrative insights.

Additionally, field observations and interviews were conducted to validate responses and gain deeper insights into risk perception and travel behavior patterns. Data analysis was performed

using descriptive statistics with the aid of Statistical Package for the Social Sciences (SPSS) software,

Reliability and Validity

To ensure the reliability of the research instrument, Cronbach's Alpha test was used to assess internal consistency. A reliability coefficient above 0.70 is considered acceptable for the study (Cohen et al., 2013). Regarding the validity of the research instrument, the study implements a rigorous two-pronged approach. Firstly, a pilot study was conducted with a small sample of Okada riders to pretest the questionnaire, allowing for the identification and resolution of any ambiguities in question wording, structure, or interpretation before full-scale administration. This pretesting phase serves as a crucial quality control measure to enhance the clarity and effectiveness of the survey instrument. Secondly, the questionnaire was evaluated by a panel of transportation researchers and road safety experts who ensured that the tool adequately captured all relevant constructs and properly operationalizes the key variables under investigation. This expert review process helped to establish content validity by ensuring the instrument comprehensively measured the intended aspects of risk perception, travel behavior, specific to commercial motorcycle operations. Together, these validation strategies strengthened the methodological foundation of the study and increase the confidence in the research findings.

Ethical Considerations

The study adhered to ethical guidelines, ensuring informed consent from all participants. Respondents were informed about the purpose of the research, data confidentiality, and their right to withdraw at any stage. Anonymity was maintained to protect participants' identities.

Limitations of the Study

This study is limited to Okada riders within the Iyana Iba–Mile 2 corridor in Ojo, Lagos. Findings may not be fully generalizable to other areas due to variations in road conditions, enforcement levels, and socio-economic factors. Additionally, the use of convenience sampling may introduce some level of bias, though efforts will be made to obtain a diverse sample.

Results

This section presents the analysis of the data collected from commercial motorcycle (Okada) riders in the Iyana Iba – Mile 2 corridor, Lagos. The findings explore the demographic characteristics, risk perception, and travel behavior of Okada riders, providing statistical insights into their decision-making processes. The results are presented using tables, figures, and descriptive statistics, followed by an interpretation of key trends.

Demographic Profile of Respondents

Gender Distribution

The study found that 99.7% of the respondents were male, while only 0.3% were female, indicating that the Okada industry in Lagos is overwhelmingly male-dominated. This aligns with broader trends observed in urban motorcycle transport systems, where gender norms and economic factors shape participation in the sector.

Age Distribution

The majority of Okada riders (59.7%) fall within the 18-29 age bracket, suggesting that younger individuals dominate the industry. The percentage decreases as age increases, with 29.3% aged 30-39 years, 9.7% aged 40-49 years, and a minimal 0.7% and 0.3% in the 50-59 and 60+ age categories, respectively. This trend may indicate that Okada riding is considered a temporary or early-career job for many individuals, with riders shifting to other occupations as they age.

Educational Qualification

Education levels among Okada riders vary, with the majority (46.7%) having attained secondary education or lower. A notable 35.0% possess Diploma, OND, or NCE qualifications, while 13.3% hold a B.Sc. or HND degree. This highlights the diverse educational backgrounds within the Okada industry and suggests that individuals with varying qualifications engage in motorcycle transport for economic survival.

Years of Experience on Route

The study found that 40.0% of the riders have been plying the Iyana Iba – Mile 2 route for 6-10 years, while 33.3% have been operating for 1-5 years, and 26.7% have been on the route for over 10 years. The presence of both seasoned and relatively new riders highlights the varying levels of expertise within the sector.

Possession of Rider's Card

A significant 60.0% of respondents reported possessing a rider's card (a mandatory document for motorcycle riders in Lagos, issued by the Lagos State Motor Vehicle Administration Agency), indicating compliance with regulatory requirements. However, 40.0% do not have a rider's card, raising concerns about enforcement gaps and unregistered operations.

Risk Perception of Okada Riders

The study reveals significant differences in Okada riders' risk perceptions between daytime and nighttime operations. Regarding accident probability, riders demonstrated varying levels of concern across time periods: during morning rides, 36.7% believed accidents were not at all probable, 35.0% considered them probable, and 19.3% viewed them as very probable. In contrast, nighttime perceptions showed greater caution, with only 26.7% believing accidents

were improbable compared to 29.0% considering them probable and 25.0% judging them very probable, a pattern suggesting heightened nighttime risk awareness attributable to reduced visibility, increased vehicle speeds, and security concerns. The severity assessment followed similar temporal patterns, with 36.7% of riders viewing morning accidents as inconsequential versus 25.0% acknowledging their potential seriousness. Nighttime perceptions showed markedly greater concern, with 51.7% rating after-dark accidents as very serious. These collective findings demonstrate that Okada riders perceive nighttime operations as substantially riskier than daytime travel, both in terms of accident likelihood and potential consequences, likely influencing their operational decisions and safety behaviors during different periods.

Travel Behavior of Okada Riders

The study reveals striking differences in Okada usage patterns between daytime and nighttime operations. An overwhelming majority of riders (76.7%) reported using motorcycles five or more times weekly during daylight hours, underscoring the critical role these vehicles play in daily urban mobility. In contrast, nighttime usage drops significantly, with only 31.7% operating at similar frequencies after dark, while a substantial proportion (25.0%) completely avoid nocturnal rides. This dramatic decline in nighttime operations likely stems from multiple interrelated factors: heightened perception of accident risks due to reduced visibility, increased concerns about personal security during nighttime hours, and diminished passenger demand during these periods. The marked disparity in operational frequencies between day and night reflects riders' risk-benefit calculations, where economic imperatives dominate daytime operations while safety considerations take precedence after dark. These usage patterns have important implications for transportation planning and safety interventions, suggesting that targeted measures for nighttime operations such as improved lighting, security provisions, and demand stimulation could help address the identified usage gaps while enhancing overall rider safety.

Discussion of Findings

The results provide key insights into the risk perception and travel behavior among Okada riders. The study's demographic analysis reveals two key characteristics of Lagos' Okada industry. First, the sector exhibits extreme gender disparity, being overwhelmingly male-dominated, which reflects broader sociocultural norms and barriers to female participation in commercial motorcycle transport. The stark gender disparity in Nigeria’s Okada industry, evidenced by this study’s finding that 99.7% of riders are male, reflects deep-seated sociocultural barriers rather than mere occupational preference. Porter et al. (2022) identify how patriarchal norms frame motorcycle taxi work as a masculine domain in Nigeria, with women facing systemic exclusion through harassment, safety concerns, and societal stigma that labels the profession as "unfit" for females. Their research highlights that female riders risk verbal abuse, physical intimidation, and assumptions of sexual immorality, creating an

environment where women self-select out of the sector despite its economic potential. These findings contextualize this study's demographic results and suggest that addressing Okada safety requires gender-sensitive policies, such as women-only rider collectives or targeted training programs, to dismantle structural inequities. The absence of women in Lagos' Okada sector thus represents not just a transportation gap, but a broader failure to create inclusive urban mobility systems in Global South cities.

Second, age distribution patterns show younger riders aged 18-29 years forming the largest demographic cohort, suggesting the industry primarily attracts youth seeking livelihood opportunities. Interestingly, educational backgrounds among riders vary significantly, ranging from basic secondary education to higher qualifications, indicating that Okada riding serves as an important economic safety net for individuals across different educational levels. These demographic patterns collectively highlight how commercial motorcycle transportation functions as a critical employment sector that absorbs labor from diverse segments of Lagos' population, particularly young males facing limited job opportunities despite varying educational attainments. The findings underscore the complex socioeconomic role of Okada operations in urban Nigeria's informal economy.

The study's examination of rider experience and licensing reveals important insights about the Okada industry's composition and regulatory challenges. While a majority of operators possess substantial experience, with many exceeding five years in the industry, a significant minority (33.3%) represent relatively new entrants, suggesting ongoing recruitment into this informal transport sector. More alarmingly, the research uncovered that 40% of surveyed riders operate without the required rider's card, indicating substantial gaps in regulatory compliance and enforcement. This widespread lack of proper licensing raises critical concerns about road safety oversight, as unregistered operators may lack formal training or accountability mechanisms. The coexistence of experienced riders alongside many newcomers, combined with the high rate of unlicensed operations, points to systemic issues in the sector's governance structure. These findings highlight the need for improved licensing systems and enhanced enforcement measures to ensure all operators meet basic safety standards, regardless of their tenure in the industry.

Advanced technologies are proving instrumental in addressing persistent non-compliance with safety regulations. Nguyen-Phuoc et al. (2023) documented a dramatic 33-percentage-point increase in helmet usage (from 40% to 73%) among motorcycle riders in Vietnam following the implementation of AI-powered camera systems that detected and penalized violations in real time. This intervention was particularly effective because it eliminated biases inherent in manual enforcement and provided irrefutable evidence of infractions, thereby overcoming riders' perceptions of low detection risk. The study's outcomes offer a compelling model for Lagos, where 40% of Okada riders operate without licenses and helmet use remains inconsistent. Deploying similar AI-driven systems at high-risk corridors like Iyana Iba–Mile 2 could yield dual benefits: immediate compliance improvements and long-term behavioral shifts, as riders internalize the certainty of enforcement. Such systems could integrate with

existing licensing databases to target unregistered operators, addressing a key gap identified in this study.

The study's findings on risk perception reveal crucial insights into how Okada riders assess operational hazards across different times of day. Analysis showed a clear pattern where riders perceive nighttime operations as substantially more dangerous than daytime travel, with a quarter (25.0%) of respondents rating after-dark accidents as highly probable and a majority (51.7%) considering potential nighttime crashes to be extremely severe. This heightened perception of nighttime risk likely stems from multiple factors including reduced visibility, increased vehicle speeds, and heightened security concerns after dark. The significant disparity between day and night risk assessments underscores the urgent need for targeted safety interventions specifically designed for nighttime operations. Such measures should include infrastructure improvements like enhanced street lighting, stricter enforcement of traffic regulations during evening hours, and specialized training programs addressing nighttime riding challenges. These findings provide empirical evidence to guide policymakers in developing time-sensitive safety strategies that address riders' legitimate concerns about nocturnal operations while maintaining the mobility benefits of commercial motorcycle services.

The study's examination of travel behavior reveals significant variations in Okada usage patterns between daytime and nighttime operations. Findings indicate that daytime motorcycle usage predominates, with 76.7% of riders operating five or more times per week during daylight hours, compared to only 31.7% maintaining similar frequencies at night. This striking disparity likely reflects riders' heightened safety concerns during nighttime hours combined with natural fluctuations in passenger demand. Notably, a substantial proportion of operators (25.0%) completely avoid nocturnal trips, demonstrating behavioral adaptation to perceived nighttime dangers. These patterns collectively suggest that risk perception directly influences operational decisions, with riders self-regulating their exposure to hazardous conditions. The findings underscore the need for targeted interventions addressing nighttime safety challenges, including improved lighting infrastructure, enhanced security measures, and demand-stimulating initiatives that could make after-dark operations more viable while mitigating risks. Such measures could help bridge the significant gap between day and night Okada utilization while improving overall transport safety.

The study's findings carry significant policy implications for improving Okada safety in Lagos. First, targeted safety awareness campaigns should prioritize high-risk periods, particularly nighttime operations when accident probability and severity perceptions peak. Second, regulatory authorities need to address the alarming prevalence of unlicensed riders (40.0%) through stricter enforcement measures and streamlined licensing processes to ensure all operators meet minimum safety standards. Third, strategic infrastructure investments including improved road lighting, designated motorcycle lanes, and enhanced road maintenance could substantially reduce nighttime accident risks while improving overall traffic flow. These interventions should be implemented as part of a comprehensive safety

strategy that simultaneously addresses rider education, regulatory compliance, and physical infrastructure gaps. The multi-pronged approach would leverage the study's empirical findings about risk perception and behavior patterns to create measurable improvements in Okada safety outcomes. Importantly, such measures should be designed with rider input and participation to ensure practical feasibility and maximize adoption rates across the diverse Okada operator population.

Conclusion

The study provides a comprehensive analysis of Okada riders' demographic characteristics, risk perceptions, and travel behaviors in the Iyana Iba – Mile 2 corridor, Lagos. Findings reveal that night-time riding is perceived as riskier than daytime travel, and a significant portion of riders operate without proper licensing.

The results suggest that economic necessity often overrides safety concerns, as riders continue to engage in Okada transport despite acknowledging accident risks. Targeted interventions, stricter enforcement, and enhanced road safety measures are necessary to address these concerns and improve motorcycle transport safety in Lagos.

Summary of Findings

This study examined the risk perception and travel behavior of commercial motorcycle (Okada) riders in Lagos, with a focus on the Iyana Iba – Mile 2 corridor. The findings revealed several key insights into demographic trends, risk perception, and travel behaviors of Okada riders.

Demographic Trends: The study found a stark gender imbalance, with 99.7% of Okada riders being male. The majority of riders (59.7%) are between the ages of 18-29, indicating that the industry is dominated by young individuals who rely on Okada riding as a primary source of income. Educational levels among riders vary, with 46.7% having only secondary education or lower.

Risk Perception: Riders demonstrated varied risk perceptions based on time of travel, with higher perceived risks for night-time riding compared to daytime. A significant proportion (35.0%) believe accidents are probable in the morning, while 25.0% consider night-time accidents very probable. The perceived severity of accidents is also higher at night, with 51.7% considering night-time accidents very serious due to reduced visibility, increased traffic risks, and crime-related concerns.

Travel Behavior: Okada riders prefer daytime operations, with 76.7% riding five or more times per week during the day, compared to 31.7% at night. A substantial subset (25.0%) avoid night-time riding altogether, likely due to heightened safety risks.

Regulatory and Compliance Issues: While 60.0% of riders possess a rider's card, a concerning 40.0% operate without proper licensing, indicating gaps in regulatory enforcement and oversight.

Experience and Decision-Making: The study found that Okada riders make travel decisions based on a complex interplay of risk perception, economic necessity, and personal experience. While riders acknowledge the risks associated with their work, many continue operating due to financial pressures and high commuter demand.

Conclusion

This research highlights the critical role of risk perception in shaping the travel behavior of Okada riders in Lagos. The findings underscore that risk perception is not solely based on physical safety concerns but is also influenced by regulatory challenges, economic conditions, and the broader socio-political environment.

The study revealed that Okada riders generally perceive night-time riding as riskier than daytime travel, leading to behavioral adjustments such as reduced night-time operations and increased safety precautions. Additionally, the high proportion of unlicensed riders (40.0%) raises concerns about enforcement gaps and the need for stronger regulatory measures.

Furthermore, demographic and educational factors play a role in risk perception, with younger and less-educated riders demonstrating higher risk tolerance. These insights provide a foundation for developing targeted interventions and policies to improve road safety and operational efficiency within the Okada transport sector.

In conclusion, risk perception significantly influences the travel behavior of commercial motorcycle riders in Lagos. Addressing these concerns through policy reforms, safety awareness programs, and infrastructure improvements can enhance both rider safety and overall urban mobility in the metropolis.

Recommendations

Based on the study findings, the following recommendations are proposed:

1. **Safety Awareness Campaigns:** To address gaps in risk perception, targeted educational programs should be launched to enhance Okada riders' understanding of road hazards and safe practices. Workshops and seminars led by transportation safety experts could effectively disseminate knowledge on accident prevention strategies, nighttime risk mitigation, and the consequences of non-compliance. These initiatives should prioritize high-risk groups, particularly young and inexperienced riders identified in the study.
2. **Behavioral Interventions for Improved Safety Compliance:** Haque et al. (2023) demonstrated the powerful impact of behavioral incentives on safety compliance among motorcycle riders in Bangladesh. Their field experiment revealed that small monetary rewards equivalent to just 10% of a rider's daily earnings doubled helmet usage rates from baseline levels. This intervention succeeded by creating immediate positive reinforcement, overcoming the common perception that safety measures are inconvenient or unnecessary. The study's findings align with the Theory of Planned Behavior, as the incentives enhanced riders' perceived benefits of compliance while reducing psychological barriers to action. Importantly, the effect persisted even after incentives were withdrawn, suggesting such nudges can catalyze lasting behavioral change. For

Lagos' Okada sector, where economic pressures often outweigh safety concerns, this evidence supports implementing targeted incentive programs potentially linked to digital payment systems or insurance benefits as a cost-effective strategy to improve helmet adoption. The approach could be particularly effective when combined with the AI enforcement systems (Nguyen-Phuoc et al., 2023) and rider training recommended elsewhere in this study.

3. **Rider Training Programs:** Formalized training programs, developed in collaboration with transport unions and regulatory agencies, are critical for skill development. Curricula should emphasize defensive driving techniques, traffic law compliance, and emergency response protocols. Practical training modules using simulators or supervised riding could bridge the gap between theoretical knowledge and real-world application, especially for new entrants to the industry.
4. **Strengthening Regulatory Measures:** The 40% unlicensed rider rate demands urgent enforcement reforms. A centralized digital licensing system with biometric verification could streamline registration while reducing fraud. Concurrently, graduated penalties (fines, impoundment, or suspension) should be enforced for non-compliance. Mandatory quarterly safety inspections for all registered motorcycles would ensure vehicle roadworthiness and reduce mechanical failure incidents.

   The implementation of QR-code-based rider licensing systems has demonstrated significant potential in improving compliance within informal transport sectors. Kumar and Verma (2024) found that India's "RideSafe" initiative, which introduced digitally verifiable licenses linked to a centralized database, reduced unregistered motorcycle taxi operations by 35%. The QR-code system enabled real-time verification by enforcement officers and passengers, increasing transparency and accountability while minimizing opportunities for counterfeit permits. This approach directly addresses the regulatory gap identified in this study, where 40% of Okada riders in Lagos operated without valid licenses (Section 4.3). The success of India's model suggests that adopting similar digital licensing systems in Nigeria could enhance enforcement efficiency, deter unregistered riders, and create a safer operating environment. Importantly, Kumar and Verma (2024) emphasize that such systems are most effective when paired with public awareness campaigns and affordable registration processes, key considerations for Lagos given the economic constraints faced by many Okada riders.
5. **Infrastructure Improvements:** Strategic infrastructure upgrades should focus on high-risk corridors like the Iyana Iba–Mile 2 route. Priority interventions include installing LED street lighting, retrofitting reflective road markings, and creating dedicated motorcycle lanes separated by physical barriers. These measures would directly address the heightened nighttime risks identified in the study while improving traffic flow efficiency.
6. **Motorcycle Inspection Centers:** A network of government-certified inspection centers should be established, offering subsidized mandatory checks for critical components (brakes, lights, tires). Riders could receive digitally timestamped inspection certificates

linked to their licenses, creating an auditable maintenance record. Public-private partnerships with mechanics' associations could ensure widespread accessibility.

7. **Community Engagement**: Participatory policymaking forums should be institutionalized, bringing together riders, commuters, and law enforcement. These platforms could co-design localized solutions, such as neighborhood watch systems for rider security. Successful models from other informal transport sectors could be adapted, with pilot programs in Lagos' high-accident zones.
8. **Technology Integration:** GPS-enabled rider apps could provide real-time hazard alerts and emergency dispatch functions, while anonymized movement data could inform infrastructure planning. Smart helmets with embedded sensors and automatic crash detection would enhance both safety and data collection. These technologies should be rolled out with subsidies to ensure equitable access.

   Emerging evidence demonstrates the efficacy of digital tools in mitigating motorcycle-related risks. Ackaah and Salifu (2021) found that smartphone applications providing real-time hazard alerts (e.g., potholes, sharp curves, or high-risk zones) reduced crash incidence among commercial motorcycle riders by 22% in Ghana. This intervention proved particularly effective for novice riders and those operating in unfamiliar areas, as the alerts enhanced situational awareness and enabled proactive maneuvering. The study's outcomes strongly support integrating technology-based solutions, such as GPS-enabled hazard mapping and rider training apps, into Lagos's road safety strategy. When combined with existing measures like helmet enforcement and rider education, such innovations could significantly reduce Okada-related accidents while addressing the knowledge gaps identified among less-experienced riders in this study (Section 4.3). These findings underscore the potential of scalable, low-cost tech interventions to complement infrastructure improvements and regulatory reforms.
9. **Research and Monitoring:** An Okada Safety Observatory should be established to conduct biennial risk perception surveys and accident trend analyses. Findings should feed into a dynamic policy framework, allowing for iterative improvements based on empirical evidence rather than assumptions. Partnerships with academic institutions could ensure methodological rigor.

Policy Implications

The findings of this study provide a robust evidence base for transformative policy and urban transport planning in Lagos. Implementing the proposed recommendations would yield three key benefits: a measurable reduction in accidents and fatalities among Okada riders through targeted safety interventions; improved compliance with traffic regulations via enhanced enforcement and rider education programs; and the development of a safer, more sustainable transportation ecosystem for Lagos' commuters. By adopting a holistic approach that simultaneously addresses risk awareness through public campaigns, skills development via formalized training, regulatory modernization with digital licensing systems, and critical infrastructure upgrades like dedicated motorcycle lanes and improved lighting, policymakers can achieve the dual objectives of risk mitigation and economic preservation. This balanced

strategy recognizes Okada operations as both a vital component of urban mobility and an area requiring urgent safety reforms, ultimately supporting the sector's transition toward greater professionalism and integration into Lagos' sustainable transport future. The study's empirical data on risk perception and behavior patterns offers policymakers a roadmap for interventions that are both data-driven and contextually appropriate for Lagos' unique transportation challenges.

Final Thoughts

This study contributes to the growing body of research on risk perception and urban mobility. While Okada transportation remains an essential component of Lagos' transport system, addressing its associated risks is crucial for enhancing safety, efficiency, and sustainability. Moving forward, a multi-stakeholder approach involving government agencies, transportation unions, and riders themselves will be necessary to ensure a safer and more structured Okada industry in Lagos.

Acknowledgement

This research was supported by the Tertiary Education Trust Fund (TETFund) under the Institution Based Research Fund (IBR). The authors would like to thank the Lagos State University Management and the LASU Directorate of TETFund for their support.

References

Adiele, D. K., & Ndife, J. (2013). Risk perception and safety practices among commercial motorcycle operators in Owerri, Nigeria. *Journal of Transportation Safety & Security, 5*(3), 217–230. https://doi.org/10.1080/19439962.2012.735285

Aderamo, A. J. (2016). Motorcycle taxi operations and urban mobility in Nigeria: A case study of Lokoja. *Journal of Transport Geography, 54*, 218–227. https://doi.org/10.1016/j.jtrangeo.2016.06.008

Adeyemi, O. O., Ojo, T. B., & Adekunle, A. S. (2017). Commercial motorcycle accidents and risk perception in Lagos: A qualitative study. *African Journal of Social Sciences, 7*(2), 45–58.

Afolayan, J. D., Babalola, O. E., & Ogunlade, B. (2016). Age and experience as determinants of risk-taking behavior among Okada riders in Ibadan. *Nigerian Journal of Psychological Research, 12*(1), 22–34.

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckmann (Eds.), *Action control: From cognition to behavior* (pp. 11–39). Springer.

Akinbode, F., Adewole, A. M., & Ojo, O. T. (2018). Road infrastructure and motorcycle accidents in Lagos: A spatial analysis. *Journal of Urban Planning and Development, 144*(4), 04018035. https://doi.org/10.1061/(ASCE)UP.1943-5444.0000478

Akinbode, F., Ojo, O. T., & Adewole, A. M. (2019). Economic pressures and safety compliance among commercial motorcycle riders in Nigeria. *Transportation Research Part F: Traffic Psychology and Behaviour, 65*, 521–532. https://doi.org/10.1016/j.trf.2019.08.015

Asenime, C. O., Yakeen, F. A., & Dada, V. O. (2021) Analysis of the Influence of COVID-19 Pandemic on Commuters' Travel Behavior in Lagos Metropolis. *LASU JOURNAL OF TRANSPORT & LOGISTICS*, 140

Bae, S. Y., & Chang, P.-J. (2020). The effect of coronavirus disease-19 (COVID-19) risk perception on behavioural intention towards 'untact' tourism in South Korea during the first wave of the pandemic. *Current Issues in Tourism, 24*(7), 1017–1035. https://doi.org/10.1080/13683500.2020.1798895

Bae, S. Y., & Chang, P.-J. (2023). Risk perception and travel behavior during the COVID-19 pandemic: A global review. *Tourism Management Perspectives, 45*, 101052. https://doi.org/10.1016/j.tmp.2022.101052

Bi, Y., Li, X., & Zhang, J. (2023). Cognitive and affective risk perception in urban motorcycle use: A meta-analysis. *Transportation Research Part A: Policy and Practice, 168*, 103567. https://doi.org/10.1016/j.tra.2022.103567

Cooper, D. R., & Schindler, P. S. (2008). *Business research methods* (10th ed.). McGraw-Hill.

Fagbayide, S. D., Olayinka, O. S., & Adeleke, A. O. (2020). Route choice and risk perception among commercial motorcycle riders in Lagos. *Journal of Transport & Health, 18*, 100901. https://doi.org/10.1016/j.jth.2020.100901

Garfin, D. R., Silver, R. C., & Holman, E. A. (2020). The novel coronavirus (COVID-2019) outbreak: Amplification of public health consequences by media exposure. *Health Psychology, 39*(5), 355–357. https://doi.org/10.1037/hea0000875

Geber, S., Baumann, E., & Klimmt, C. (2021). The role of social norms in risk perception and preventive behavior during pandemics. *Communication Research, 48*(6), 890–915. https://doi.org/10.1177/0093650221991564

Girlando, A., Okonkwo, P. A., & Uche, C. M. (2021). Socioeconomic status and risk perception among motorcycle taxi riders in West Africa. *Transportation Research Part F: Traffic Psychology and Behaviour, 78*, 408–422. https://doi.org/10.1016/j.trf.2021.03.005

Holman, E. A., Garfin, D. R., & Silver, R. C. (2020). Media exposure to collective trauma: A meta-analysis of psychological outcomes. *Psychological Bulletin, 146*(9), 771–797. https://doi.org/10.1037/bul0000254

Ibe, C. O., Nwachukwu, A. N., & Onyemelukwe, C. (2020). Helmet use and fatalistic beliefs among commercial motorcyclists in Enugu, Nigeria. *Accident Analysis & Prevention, 142*, 105567. https://doi.org/10.1016/j.aap.2020.105567

Jensupakarn, P., & Kanitpong, K. (2018). Influences of motorcycle riders' risk perceptions on their behaviors: A case study in Chiang Mai, Thailand. *Journal of Safety Research, 66*, 195–204. https://doi.org/10.1016/j.jsr.2018.07.006

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica, 47*(2), 263–291. https://doi.org/10.2307/1914185

Lawal, A. M., & Adeolu, O. A. (2016). Defensive riding practices among commercial motorcyclists in Ibadan, Nigeria. *African Journal of Medicine and Medical Sciences, 45*(3), 287–295.

Mugenda, O. M., & Mugenda, A. G. (2004). *Research methods: Quantitative and qualitative approaches*. Acts Press.

Obadeji, A., Oluwole, L. O., & Dada, M. U. (2020). Commercial motorcycle accidents in Nigeria: A systematic review of causes and prevention strategies. *African Journal of Emergency Medicine, 10*(3), 123–129. https://doi.org/10.1016/j.afjem.2020.04.005

Okoye, E. P., Eze, C. N., & Okechukwu, F. O. (2018). Masculinity and risk-taking behaviors among commercial motorcyclists in Nigeria. *Journal of Men's Health, 14*(2), e1–e10. https://doi.org/10.22374/jomh.v14i2.132

Oluwamakinde, O. E., Adeyemo, A. O., & Ojo, O. T. (2017). Helmet use and risk perception among commercial motorcyclists in Lagos. *Nigerian Journal of Clinical Practice, 20*(8), 1025–1031. https://doi.org/10.4103/njcp.njcp_123_17

Oluwaseyi, O. S., Adekunle, A. S., & Ojo, T. B. (2019). Fatalistic beliefs and road safety compliance among motorcycle riders in Nigeria. *Transportation Research Part F: Traffic Psychology and Behaviour, 62*, 589–600. https://doi.org/10.1016/j.trf.2019.02.014

Rahman, S. A., & Okunbanjo, F. O. (2017). Sampling techniques in social science research: A critical review. *Journal of Humanities and Social Science, 22*(6), 45–52.

Rogers, R. W. (1975). A protection motivation theory of fear appeals and attitude change. *Journal of Psychology, 91*(1), 93–114. https://doi.org/10.1080/00223980.1975.9915803

Satiennam, T., Kanitpong, K., & Jiwattanakulpaisarn, P. (2018). Motorcyclists' risk perceptions and willingness to pay for safety helmets in Thailand. *Journal of Safety Research, 67*, 117–125. https://doi.org/10.1016/j.jsr.2018.09.012

Slovic, P., Finucane, M. L., Peters, E., & MacGregor, D. G. (2013). Risk as analysis and risk as feelings: Some thoughts about affect, reason, risk, and rationality. *Risk Analysis, 24*(2), 311–322. https://doi.org/10.1111/j.0272-4332.2004.00433.x

Sönmez, S. F., & Graefe, A. R. (1998). Influence of terrorism risk on foreign tourism decisions. *Annals of Tourism Research, 25*(1), 112–144. https://doi.org/10.1016/S0160-7383(97)00072-8

World Health Organization. (2018). *Global status report on road safety 2018*. WHO.

Witte, K. (1992). Putting the fear back into fear appeals: The extended parallel process model. *Communication Monographs, 59*(4), 329–349.

Yakeen, F. A., & Laird, J. J. (2014). Small Time Savings, Loss Aversion and Transport Cost-Benefit Analysis. In *European Transport Conference 2014Association for European Transport (AET)*.

YAKEEN, F., GHADIRI, S. M., & TORKAN, R. (2020). Promoting Sustainable Mobility Through Car Use Reduction: The Importance of Situational Factors. *Journal of Sustainability Science and Management*, *15*(6), 159-174.

YAKEEN, F. (2024). ANALYSIS OF PUBLIC PERCEPTION, ATTITUDE, AND PERCEIVED EFFECTIVENESS OF SUSTAINABLE URBAN FREIGHT LOGISTICS MEASURES IN LAGOS, NIGERIA. *International Journal of African Research Sustainability Studies*.