

Knowledge, Awareness, and Helmet-Use Behaviour Among Motorcyclists in Ado-Ekiti for Head Injury Prevention

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Abstract

Background: Motorcycle-related head injuries remain a major public health concern in low- and middle-income countries. Although helmet use is an effective preventive measure, compliance remains inconsistent due to various contextual factors.

Objective: To assess the knowledge, awareness, and helmet-use behaviour among motorcyclists in Ado-Ekiti, Nigeria, and identify predictors of helmet use for head injury prevention.

Methods: A community-based cross-sectional study was conducted among 356 motorcyclists using a structured, pre-tested questionnaire. Data were analyzed using descriptive statistics and multivariable logistic regression at a significance level of $p < 0.05$.

Results: The majority of respondents were male (89.9%) and aged 20–39 years (66.3%). Overall, 62% demonstrated good knowledge, while 42% had high awareness of helmet use and related laws. Although 71.0% reported always wearing helmets, only 40% exhibited good helmet-use practices. Helmet use was inconsistent in specific situations, particularly during hot weather (51.0%) and in light traffic (59.0%). Major barriers included hot weather (86.0%), cost (79.0%), helmet discomfort (71.2%), availability issues (66.0%), and weak enforcement (76.1%). A majority (60.1%) had experienced motorcycle crashes, with only 40.2% wearing helmets during their most recent crash, and 32.0% reporting prior head injuries. Significant predictors of helmet use included older age (AOR = 2.18), male sex (AOR = 1.80), tertiary education (AOR = 2.75), longer riding experience (AOR = 2.20), good knowledge (AOR = 3.60), high awareness (AOR = 2.35), strong enforcement perception (AOR = 3.00), and absence of cost barriers (AOR = 1.90).

Conclusion: Despite relatively high knowledge and awareness, helmet-use practices remain suboptimal. Addressing structural barriers through strengthened enforcement, improved affordability, and targeted behavioural interventions is essential for reducing motorcycle-related head injuries.

Keywords: Helmet use, Motorcycle injuries, Head injury prevention, Road traffic injuries, Nigeria, Neurotrauma, Public health

1. Introduction

Road traffic injuries constitute a major global public health problem, accounting for approximately 1.19 million deaths annually, with over 90% occurring in low- and middle-income countries (LMICs) [1]. Motorcyclists represent one of the most vulnerable groups of road users due to minimal physical protection, and head injuries remain the leading cause of death and long-term disability following motorcycle crashes [2]. The burden is particularly high in sub-Saharan Africa, where rapid urbanization, inadequate transport systems, and increasing reliance on motorcycles for commercial transportation have contributed to rising rates of road traffic injuries [3].

Helmet use is widely recognized as the most effective strategy for preventing head injuries among motorcyclists. Evidence shows that appropriate helmet use reduces the risk of head injury by up to 69% and the risk of death by approximately 40% [4]. Consequently, the World Health Organization recommends universal helmet legislation, proper helmet standards, and consistent enforcement as essential components of road safety interventions [1]. Despite these recommendations, compliance with helmet use remains suboptimal in many LMICs, largely due to behavioural, economic, and systemic challenges.

In Nigeria, motorcycles—commonly referred to as “okada”—serve as an important means of transportation, particularly in urban and peri-urban areas where traffic congestion and limited public transport systems persist. However, their widespread use has been associated with a high incidence of road traffic crashes and head injuries, which contribute significantly to trauma-related morbidity and mortality [5]. Recent Nigerian studies (2020–2024) have consistently reported a disconnect between knowledge and practice of helmet use among motorcyclists. For instance, Ipingbemi reported low compliance with helmet use despite awareness of its benefits among riders in Nigeria [6]. Similarly, Rabi et al. found that although motorcyclists demonstrated good knowledge of helmet use, actual usage was inconsistent due to various contextual factors [7]. Recent findings from south-western Nigeria further indicate that helmet use remains suboptimal, with socio-economic constraints and weak enforcement playing major roles [8].

Several factors influence helmet-use behaviour in Nigeria. These include the cost and availability of helmets, discomfort—especially in hot weather—and misconceptions about their impact on vision and hearing [6,8]. Weak and inconsistent enforcement of helmet laws has also been identified as a critical barrier to compliance. Evidence suggests that effective enforcement strategies, including routine monitoring and penalties, significantly improve helmet use among riders [9]. In addition, risk perception and exposure to safety campaigns are important determinants of protective behaviour, as individuals who perceive themselves to be at higher risk are more likely to adopt preventive measures [10].

Despite increasing research on motorcycle safety in Nigeria, there is limited context-specific evidence from Ado-Ekiti and its environs. Given the high reliance on motorcycles for daily transportation in this setting, understanding the interplay between knowledge, awareness, behaviour, and enforcement is essential for designing effective interventions.

This study therefore assessed the knowledge, awareness, and helmet-use behaviour among motorcyclists in Ado-Ekiti for head injury prevention and identified key predictors of helmet use. The findings are expected to inform targeted public health strategies aimed at reducing motorcycle-related head injuries in Nigeria.

2. Methodology

2.1. Study Design and Setting

This study was a community-based cross-sectional survey conducted among motorcyclists in Ado-Ekiti, the capital city of Ekiti State, Nigeria. Ado-Ekiti is a rapidly growing urban centre with a high reliance on motorcycles (“okada”) for both commercial

and personal transportation due to traffic congestion and limited public transport systems.

2.2. Study Population

The study population comprised both commercial and private motorcyclists operating within Ado-Ekiti metropolis. Commercial motorcyclists were primarily recruited from recognized motorcycle parks and major transit routes, while private riders were identified at fuel stations, residential areas, and busy road intersections.

2.3. Population Estimation

Given the absence of a comprehensive registry of motorcyclists in Ado-Ekiti, the study population was estimated using data from local motorcycle unions and transport authorities. Records obtained from major motorcycle parks and the local branch of the riders' association provided an approximate number of registered commercial riders within the metropolis. This was supplemented with field observations and mapping of high-traffic routes to account for unregistered and private motorcyclists.

2.4. Sample Size Determination

The sample size was calculated using the standard formula for cross-sectional studies:

$$N = \frac{Z^2 p(1 - p)}{d^2}$$

Where N = minimum sample size; Z = standard normal deviate at 95% confidence level (1.96); p = estimated prevalence of helmet use from previous Nigerian studies; d = margin of error (5%)

After adjusting for non-response, a final sample size of 356 respondents was obtained.

2.5. Sampling Technique

A multistage sampling technique was employed to ensure representativeness across the metropolitan area:

Stage 1: Selection of clusters

Ado-Ekiti was stratified into major geographic zones based on administrative wards and key transportation hubs. Major motorcycle parks and high-traffic routes within each zone were identified.

Stage 2: Selection of sampling sites

From each zone, a proportionate number of motorcycle parks and strategic locations (e.g., junctions, markets, and fuel stations) were selected using simple random sampling.

Stage 3: Selection of participants

Eligible motorcyclists at each selected site were recruited using systematic sampling. For example, every 2nd or 3rd rider encountered (depending on traffic flow) was approached for participation until the allocated sample size for that location was achieved.

Both commercial and private riders were included to reflect the diversity of motorcycle use in the city.

2.6. Inclusion and Exclusion Criteria

Motorcyclists were included if they were aged 18 years and above, were riders operating within Ado-Ekiti during the study peri-

od and those who provided informed consent

Motorcycle riders were excluded if they were unwilling to participate, were not riders operating within Ado-Ekiti or were unwilling to give informed consent for the study.

2.7. Data Collection Tool and Procedure

Data were collected using a structured, pre-tested questionnaire designed to assess: Socio-demographic characteristics Knowledge of helmet use Awareness of helmet laws and safety risks Helmet-use behaviour and practices Factors influencing helmet use Crash history and risk perception

The questionnaire was administered through interviewer-assisted face-to-face interactions to ensure clarity and completeness. Data collection was conducted over a defined study period by trained research assistants.

2.8. Data Analysis

Data were coded and analyzed using SPSS version 23.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to summarize variables as frequencies, percentages, and means \pm standard deviation.

Composite scores were generated for knowledge, awareness, and helmet-use practices based on responses to Likert-scale items. Each item was scored on a 5-point scale (1 = strongly disagree to 5 = strongly agree). For each domain, individual item scores were summed to obtain a total score. The total scores were converted into percentages and categorized as follows: Good: $\geq 70\%$ Fair: 50–69% Poor: $< 50\%$ these cut-offs were adapted from similar behavioral studies and allowed for standardized classification of respondents. For inferential analysis, variables with $p < 0.20$ in bivariate analysis were included in the multivariable logistic regression model. Model fitness was assessed using the Hosmer–Lemeshow goodness-of-fit test. Multicollinearity among independent variables was evaluated using Variance Inflation Factor (VIF), with a threshold of < 10 indicating acceptable levels. Adjusted odds ratios (AORs) with 95% confidence intervals were reported, and statistical significance was set at $p < 0.05$.

2.9. Ethical Consideration

Ethical approval for this community-based study was obtained from the Institutional Review Board (IRB) of Ekiti State University Teaching Hospital, Ado-Ekiti, Nigeria, prior to the commencement of the study.

Permission to conduct the study within the community was obtained from motorcycle park leaders and motor cycle union representatives and leaders in Ado-Ekiti. The study was conducted in accordance with established ethical principles guiding research involving human participants.

Participation was entirely voluntary, and respondents were informed of their right to decline participation or withdraw from the study at any stage without any consequences.

2.9.1. Trial Registration

Clinical trial number: Not applicable.

2.9.2. Informed Consent

Informed consent was obtained from all participants before data collection. The purpose, procedures, and relevance of the study were clearly explained to the respondents in a language they understood. Only individuals who provided consent were included in the study.

2.9.3. Confidentiality

All information obtained from participants was treated with strict confidentiality. No personal identifiers were recorded, and responses were anonymized. Data collected were securely stored and used solely for research purposes.

3. Results

3.1. Socio-demographic and Riding Characteristics

Table 1: Socio-demographic and Riding Characteristics of Respondents (n = 356)

Variable	Categories	Frequency (n)	Percentages (%)
Age group (years)	<20	22	6.2
	20-29	122	34.3
	30-39	114	32.0
	≥40	98	27.5
Sex	Male	320	89.9
	Female	36	10.1
Education	Primary	107	30.1
	Secondary	160	44.9
	Tertiary	89	25.0
Marital status	Single	142	39.9
	Married	214	60.1
Type of rider	Commercial	270	75.8
	Personal	86	24.2
Riding experience (years)	<1	52	14.6
	1-3	150	42.1
	4-6	100	28.1
	> 6	54	15.2
Riding frequency	Daily	249	69.9
	Occasionally	107	30.1
Hours spent riding/day*	<3 hours	82	23.0
	3-5 hours	102	28.7
	6-8 hours	128	36.0
	>8 hours	44	12.3

Footnotes: Percentages are calculated based on total respondents (n = 356). Minor differences may occur due to rounding

A total of 356 motorcyclists participated in this study. The majority of respondents were aged 20–29 years (34.3%), followed by those aged 30–39 years (32.0%), while 6.2% were younger than 20 years and 27.5% were aged 40 years and above (table 1). Most respondents were male (89.9%), reflecting the male predominance in motorcycle transportation.

In terms of educational attainment, 44.9% had secondary education, 30.1% had primary education, and 25.0% had tertiary education. A majority of respondents were married (60.1%). Commercial riders constituted 75.8% of the study population, and most participants (69.9%) reported riding daily. Regarding riding experience, 28.1% had 4–6 years of experience, while 15.2% had more than 6 years. In addition, 36.0% of respondents reported spending 6–8 hours per day riding (table 1).

3.2 Knowledge and Awareness of Helmet Use

Overall, respondents demonstrated a high level of knowledge regarding helmet use. A large proportion agreed that helmets reduce the risk of head injuries (92.4%) and protect the skull and brain (94.1%) as shown in table 2. Additionally, 90.2% acknowledged that helmet use can prevent death in severe crashes. However, comparatively fewer respondents were aware that helmets should be replaced after major crashes (70.5%) as shown in table 2.

Table 2: Knowledge and Awareness of Helmet Use and Laws

Knowledge variable	Mean \pm SD	Agree (%) Knowledge
Helmets reduce head injuries	4.52 \pm 0.71	92.4
Protect skull/brain	4.60 \pm 0.65	94.1
No helmet increases severity	4.41 \pm 0.82	88.2
Standard helmets better	4.10 \pm 0.93	80.3
Replace after crash	3.85 \pm 1.01	70.5
Chin strap necessary	4.32 \pm 0.88	85.1
Correct usage knowledge	4.05 \pm 0.97	78.0
Absorb impact	4.22 \pm 0.90	82.3
Prevent death	4.48 \pm 0.74	90.2
Awareness Helmet law required	4.35 \pm 0.85	86.0
Passengers must wear	3.98 \pm 1.02	75.3
Awareness of fines	3.76 \pm 1.10	68.5
Exposure to campaigns	3.60 \pm 1.12	65.0
Deaths from head injury	4.40 \pm 0.80	89.0
Police enforcement awareness	3.55 \pm 1.15	60.4
Media information	3.82 \pm 1.08	70.2

Summary: Good knowledge = 62%; High awareness = 42%

Footnotes: “Agree (%)” represents proportion selecting “agree/strongly agree”. Composite scores were used to classify knowledge and awareness

Other knowledge-related indicators showed that 88.2% recognized that not wearing a helmet increases injury severity, while 80.3% acknowledged the superiority of standard helmets. Awareness of correct helmet usage and functions, including impact absorption and chin strap importance, was also relatively high.

In terms of awareness, 86.0% of respondents were aware that helmet use is legally required, while 75.3% knew that passengers are also required to wear helmets. Awareness of enforcement measures was lower, with only 60.4% acknowledging police enforcement. Additional awareness indicators such as awareness of fines (68.5%), exposure to safety campaigns (65.0%), and me-

dia information (70.2%) were moderate. Overall, 62% of respondents had good knowledge, while 42% demonstrated high awareness of helmet laws and safety risks as shown in table 2.

3.3 Helmet-use Behaviour and Practice

Helmet-use practices varied among respondents. While 71.0% reported always wearing helmets, only 66.3% consistently fastened the chin strap (table 3). Helmet use was more consistent for general riding (69.4%) and short trips (61.0%), but declined under certain conditions, such as during hot weather (51.0%) and in light traffic (59.0%) as shown in table 3.

Table 3: Helmet-Use Behaviour and Practice

Item	Mean \pm SD	Good Practice (%)
Always wear helmet	3.92 \pm 1.08	71.0
Fasten chin strap	3.74 \pm 1.12	66.3
Wear on short trips	3.52 \pm 1.18	61.0
Wear at all times	3.85 \pm 1.02	69.4
Wear in light traffic	3.45 \pm 1.22	59.0
Wear in hot weather	3.12 \pm 1.28	51.0
Ride without helmet (R)	2.75 \pm 1.32	42.0
Encourage passengers	3.65 \pm 1.10	63.5
Refuse passengers without helmet	3.25 \pm 1.20	56.2

Practice classification: Good 40%, Fair (42%), Poor (18%)

Footnotes: (R) indicates reverse-coded item. Percentages represent reported behaviors

Notably, 42.0% of respondents admitted to occasionally riding without a helmet. Encouragingly, 63.5% reported encouraging passengers to wear helmets, although only 56.2% refused to carry passengers without helmets.

Overall, 40% of respondents demonstrated good helmet-use practices, while 42% had fair practices and 18% had poor practices (table 3).

3.4 Factors Affecting Helmet Use and Enforcement Perception

Table 4: Factors Affecting Helmet Use and Enforcement Perception

Factor	Mean \pm SD	Agree (%)
Helmet discomfort	3.82 \pm 1.08	71.2
Cost of helmets	4.12 \pm 0.98	79.0
Availability issues	3.65 \pm 1.12	66.0
Hot weather	4.32 \pm 0.83	86.0
Weak enforcement	4.02 \pm 0.92	76.1
Better enforcement increases use	4.38 \pm 0.78	89.0
Cheaper helmets increase use	4.25 \pm 0.88	83.2
Helmets increase safety	4.52 \pm 0.68	93.0

Footnotes: Multiple responses allowed; percentages do not sum to 100%

Several factors influencing helmet use were identified. A high proportion of respondents agreed that hot weather discourages helmet use (86.0%), while 79.0% identified cost as a barrier (table 4). Additionally, 76.1% perceived enforcement of helmet laws as weak (table 4).

Other important barriers included helmet discomfort (71.2%) and availability issues (66.0%). Conversely, 89.0% reported that stronger enforcement would improve helmet use, and 83.2% indicated they would use helmets more if they were cheaper. A majority (93.0%) agreed that helmets improve safety, highlighting a strong perceived benefit despite existing barriers (Table 4).

3.5 Crash History and Risk Perception

A significant proportion of respondents (60.1%) reported having been involved in a motorcycle crash (table 5). Among these, only 40.2% reported wearing a helmet at the time of their most recent crash. Furthermore, 32.0% had sustained head injuries from previous crashes (Table 5).

Most respondents (69.9%) had witnessed severe motorcycle crashes. Risk perception was generally high: 94.5% agreed that riding without a helmet is risky, 81.0% perceived themselves to be at risk of a crash, and 93.8% believed that helmets reduce the risk of death (Table 5).

Table 5: Crash, Injury History and Risk Perception

Variable	Category	Frequency (n)	Percentages (%)
Ever had crash	Yes	214	60.1
	No	142	39.9
Helmet worn during crash	Yes	86	40.2
	No	128	59.8
Head injury history	Yes	114	32.0
	No	214	60.1
	Not sure	28	7.9
Witnessed severe crash	Yes	249	69.9
	No	107	30.1

Risk perception

Riding without helmet risky: 4.62 ± 0.63 (94.5%)

Personal crash risk: 4.12 ± 0.92 (81.0%)

Helmets reduce death: 4.57 ± 0.66 (93.8%)

3.6 Predictors of Helmet Use

Multivariable logistic regression analysis identified several significant predictors of good helmet use. Respondents aged 40 years and above were more likely to practice good helmet use compared to those under 20 years (AOR = 2.18, 95% CI: 1.20–3.96, $p = 0.018$). Male respondents were also more likely to use helmets compared to females (AOR = 1.80, 95% CI: 1.05–3.10, $p = 0.035$) (Table 6).

Knowledge and awareness played critical roles: respondents with good knowledge were over three times more likely to use helmets (AOR = 3.60, 95% CI: 2.10–6.15, $p < 0.001$), while those with high awareness were more than twice as likely to do so

(AOR = 2.35, 95% CI: 1.40–3.95, $p = 0.002$). Perceived strong enforcement was also a significant predictor (AOR = 3.00, 95% CI: 1.75–5.20, $p < 0.001$). Additionally, absence of cost barriers was associated with increased helmet use (AOR = 1.90, 95% CI: 1.12–3.25, $p = 0.028$) (Table 6).

Table 6: Logistic Regression Analysis of Predictors of Good Helmet

Variable	Comparison	Adjusted OR	95% Confidence Interval	p-value
Age	≥ 40 vs < 20	2.18	1.20–3.96	0.018
Sex	Male vs Female	1.8	1.05–3.10	0.035
Education	Tertiary vs \leq Primary	2.75	1.55–4.88	0.001
Riding Experience	> 6 yrs vs ≤ 3 yrs	2.2	1.28–3.78	0.006
Knowledge Level	Good vs Poor	3.6	2.10–6.15	< 0.001
Awareness Level	High vs Low	2.35	1.40–3.95	0.002
Enforcement perception	Strong vs Weak	3	1.75–5.20	< 0.001
Cost Barrier	No vs Yes	1.9	1.12–3.25	0.028

Higher educational attainment was a strong predictor, with respondents having tertiary education showing increased odds of helmet use (AOR = 2.75, 95% CI: 1.55–4.88, $p = 0.001$). Similarly, longer riding experience (> 6 years) was associated with better helmet use (AOR = 2.20, 95% CI: 1.28–3.78, $p = 0.006$).

The Hosmer–Lemeshow test indicated good model fit ($p > 0.05$). No evidence of multicollinearity was observed among independent variables (all VIF values < 2), confirming the robustness of the regression model.

4. Discussion

4.1. Knowledge and Helmet-use Behaviour Gap

This study examined the relationship between knowledge, awareness, and helmet-use behaviour among motorcyclists in Ado-Ekiti, Nigeria, while also identifying key predictors of compliance. Although a substantial proportion of respondents demonstrated good knowledge and high risk perception, consistent helmet use remained inadequate. This disconnect between what riders know and how they behave highlights a critical challenge in injury prevention efforts within this setting.

The high level of knowledge observed among respondents is consistent with previous studies conducted in Nigeria and other LMICs, which have reported widespread awareness of the protective benefits of helmet use [6,7]. Similarly, global evidence indicates that most motorcyclists are aware that helmets reduce the risk of head injury and death [4]. However, despite this high level of knowledge, only 40% of respondents demonstrated good helmet-use practices (Table 3). This finding aligns with earlier studies in Nigeria that reported poor compliance despite adequate knowledge, suggesting that knowledge alone is insufficient to drive behavioural change [6–8].

4.2. Awareness and Role of Enforcement

Awareness of helmet laws was moderate (table 2), but awareness of enforcement mechanisms was relatively low. This finding supports previous reports indicating that weak dissemination and inconsistent enforcement of traffic safety regulations contribute to poor compliance in Nigeria [9]. In the present study, perceived enforcement emerged as a strong predictor of helmet use (table 6), with riders who perceived enforcement as strong being significantly more likely to wear helmets.

This is consistent with global evidence demonstrating that strict enforcement of helmet laws significantly increases compliance and reduces injury rates [1,4]. Furthermore, the high proportion of respondents indicating that stronger enforcement would improve helmet use (Table 4) reinforces the critical role of regulatory systems in shaping behaviour.

4.3. Environmental and Economic Barriers

Environmental and economic factors were major barriers to helmet use (table 4). A large proportion of respondents reported that hot weather discourages helmet use, which is consistent with findings of the studies conducted by Adeyemi et al. and Ukah et al. in tropical regions where heat and discomfort significantly reduce compliance [8,11]. Helmet discomfort and availability challenges further compounded these barriers.

Cost was also identified as a key barrier, with many respondents indicating that affordability would improve helmet use (Table 4). This finding is in agreement with previous Nigerian studies, which have highlighted the high cost and limited availability of standard helmets as major deterrents [6,8]. These results underscore the importance of addressing structural barriers through policy interventions such as subsidies, regulation of helmet prices, and improved access to affordable, quality helmets.

4.4. Crash Experience and Risk Perception

The high prevalence of crash involvement observed in this study (table 5) further emphasizes the vulnerability of motorcyclists. Notably, only a minority of respondents reported wearing helmets during their most recent crash, which is consistent with previous findings in the studies conducted by Solagberu et al. and Weze in Nigeria where helmet use at the time of injury remains low [5,12]. The substantial proportion of respondents who had sustained head injuries underscores the critical importance of helmet use in preventing severe outcomes.

Although risk perception was high among respondents (Table 5), this did not consistently translate into safe practices, suggesting that risk awareness alone is insufficient without enabling environmental and policy conditions [10].

4.5. Predictors of Helmet Use

Multivariable analysis identified several predictors of helmet use (table 6), including older age, male sex, higher education, longer riding experience, good knowledge, high awareness, and strong enforcement perception. These findings are consistent with findings of the study conducted by Rabiou et al. and the report of the Federal Road safety Corps in Nigeria demonstrating that education and experience enhance risk perception and promote protective behaviours [7,9].

The strong association between enforcement perception and helmet use highlights the importance of regulatory frameworks in shaping behaviour. Similarly, the influence of cost barriers further emphasizes the need for integrated approaches that combine behavioural, economic, and policy interventions.

4.6. Implications for Practice and Policy

Overall, the findings of this study suggest that improving helmet-use behaviour requires a multifaceted approach. While educational interventions are important, they must be complemented by strengthened enforcement of helmet laws, improved affordability and accessibility of helmets, and context-specific strategies to address environmental barriers.

Public health interventions should focus on translating knowledge into consistent practice through behaviour-focused campaigns and policy-driven approaches.

4.7. Limitations of the Study

This study has some limitations that should be considered when interpreting the findings. First, the cross-sectional design limits the ability to establish causal relationships between the identified factors and helmet-use behaviour.

Second, the study relied on self-reported data, which may be subject to recall bias and social desirability bias, potentially leading to overestimation of good practices such as helmet use. Third, the study was conducted within a single urban setting, which may limit the generalizability of the findings to other regions with different socio-cultural or infrastructural contexts.

Additionally, some behavioural variables were assessed using composite scoring systems, which, although useful for analysis, may not fully capture the complexity of real-life practices.

6. Conclusion

In summary, this study shows that knowledge and awareness of helmet use among motorcyclists in Ado-Ekiti are relatively high, yet consistent and correct usage remains suboptimal. The findings suggest that knowledge alone does not necessarily translate into safer behaviour. Instead, helmet use is shaped by a combination of individual, environmental, and systemic factors, including cost, discomfort, and weak enforcement.

Addressing these barriers requires a coordinated approach that goes beyond education alone. Strengthening enforcement, improving access to affordable helmets, and implementing context-specific behavioural interventions will be essential in reducing the burden of motorcycle-related head injuries.

7. Recommendations

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

Strengthen enforcement of helmet laws: Regulatory agencies should intensify routine monitoring and enforcement to ensure compliance among motorcyclists.

Improve affordability and accessibility of helmets: Government and stakeholders should consider subsidizing helmet costs and promoting the availability of standard, quality helmets.

Implement targeted behavioural interventions: Public health campaigns should move beyond awareness creation to focus on behavioural change strategies that address practical barriers such as discomfort and misconceptions.

Promote rider education and training: Continuous education programs should be introduced to reinforce the importance of consistent and proper helmet use.

Encourage public-private partnerships: Collaboration between government agencies and private sector stakeholders can improve helmet distribution and accessibility.

Conduct further research: Longitudinal and multi-centre studies are needed to better understand behavioural patterns and evaluate the effectiveness of interventions.

Declarations

Author Contributions

The author solely conceived and designed the study, conducted data collection, performed data analysis, and drafted and revised the manuscript. The author also approved the final version of the manuscript for submission.

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Ethical Approval

Ethical approval for this community-based study was obtained from the Institutional Review Board (IRB) of Ekiti State University Teaching Hospital, Ado-Ekiti, Nigeria, prior to the commencement of the study. Permission was also obtained from relevant local authorities and motorcycle union representatives within the study area.

Informed Consent

Informed consent was obtained from all participants before inclusion in the study. The purpose and procedures of the study were clearly explained to all respondents, and participation was entirely voluntary.

Conflict of Interest

The author declares that there is no conflict of interest regarding the publication of this study.

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Data Availability

The datasets generated and/or analyzed during the current study are available from the author on reasonable request.

Compliance with Ethical Standards and Human Rights

This study was conducted in accordance with internationally accepted ethical standards for research involving human participants, including the principles outlined in the Declaration of Helsinki and consistent with the principles of the United Nations Universal Declaration of Human Rights. The dignity, rights, safety, and well-being of all participants were respected throughout the study.

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