



## RESEARCH ARTICLE

# Evaluating The Effectiveness of Implementing Trainee Motorcycle Riders' Curriculum on Road Safety: A Systematic Review of Recent Studies

<sup>a</sup>Joram Kabelinde, <sup>b</sup>Daniel O. Onyango, <sup>b</sup>Prosperity M. Mwila

<sup>a</sup> PhD Scholar: St Augustine university of Tanzania

<sup>b</sup> Academician, Saint Augustine University of Tanzania

## Corresponding Author

Joram Kabelinde, Email: [kabelindejays@gmail.com](mailto:kabelindejays@gmail.com)

## Author's Contributions

All authors contributed equally to this research.

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## ABSTRACT

This systematic review evaluates the effectiveness of vocational institutes in implementing pre-service programmes for motorcycle riders; drawing from studies published between 2020 and 2026. The review focuses on how vocational institutes' instructors inculcate positive attitudes among riders toward passenger safety. A comprehensive search across databases (PubMed, Scopus, Web of Science, and Google Scholar) and gray literature sources yielded 12 relevant empirical studies from the United States, the United Kingdom, Nigeria, Zambia, South Africa, Kenya, and Tanzania. Narrative synthesis revealed moderate success in fostering passenger safety attitudes (55–80 percent improvement) through interactive instructor-led methods. Findings highlight resource constraints and coordination gaps in low- and middle-income settings as key barriers, contrasting with higher effectiveness in resource-rich environments. The review underscores the need for infrastructure investment, culturally tailored attitude modules, and formalized authority partnerships to enhance vocational institutes' impact on reducing motorcycle-related fatalities.

**Keywords:** motorcycle rider training; road safety; vocational institutes' curriculum; passenger safety attitudes

## INTRODUCTION

Motorcycle rider training programs trace their origins to the 1970s. In the United States, the Motorcycle Safety Foundation (MSF) pioneered structured curricula in 1973, initially focusing on basic operator courses. Over time, these evolved into research-based systems such as the Basic Rider Course (BRC) introduced in 2001, emphasizing both risk awareness and practical skills to reduce fatalities (Motorcycle Safety Foundation, 2023). In the USA, the MSF's Rider Education and Training System (RETS) had expanded to over 20 courses by the 2010s, integrating adult learning methodologies and focusing on crash prevention, with states mandating training for licensing, contributing to a 10-20 percent reduction in novice rider crashes (National Highway

Traffic Safety Administration [NHTSA], 2022). The UK adopted similar approaches through the Royal Society for the Prevention of Accidents (RoSPA) and compulsory basic training (CBT) since 1990, updated in the 2020s to include hazard perception and eco-safe riding, aligning with European Union (EU) directives for standardized licensing and achieving lower fatality rates compared to non-trained riders (Department for Transport, 2024).

In Africa, motorcycle training has lagged due to informal sector dominance, but initiatives emerged post-2010 amid urbanization. Nigeria introduced basic rider programmes via the Federal Road Safety Corps (FRSC) in 2020, focusing on urban taxi operators to curb accidents (Oginni et al., 2022). South Africa,

through the Motorcycle Safety Institute (MSI), developed urban and advanced courses by 2022, emphasizing risk awareness in high-traffic environments (MSI, 2023). Zambia's efforts via the Road Transport and Safety Agency (RTSA) since 2021 targeted rural riders with practical modules (RTSA, 2024). Kenya's motorcycle training under the National Transport and Safety Authority (NTSA) evolved from 2018 regulations to include passenger safety in 2023 curricula (NTSA, 2025).

In Tanzania, Vocational Education and Training Authority (VETA) motorcycle trainee riders' curriculum also is a targeted intervention to enhance road safety amid rising motorcycle usage for transport. The VETA's curriculum, formalized in 2015 and revised in 2022, integrates competency-based training for commercial riders, addressing a 30 percent rise in motorcycle fatalities from 2010-2020, drawing from global models but adapting to local contexts like informal transport (VETA, 2024). This review evaluates vocational institutes' implementation effectiveness through examining instructors' role in fostering positive attitudes toward passenger safety.

The empirical literature from 2020 to 2026 provides a comprehensive examination of motorcycle riders' training programmes, offering insights that are highly relevant to assessing the effectiveness of the vocational institutes motorcycle trainee riders' curriculum in Tanzania. In terms of how instructors inculcate positive attitudes among motorcycle riders towards passenger safety, several studies demonstrate that structured, instructor-led training significantly enhances riders' perceptions of responsibility and risk awareness. For instance, Oginni et al. (2022) in Nigeria found that 65 percent of participants exhibited improved attitudes toward passenger helmet use and protection measures, which contributed to a 25 percent reduction in passenger-related injuries. Similarly, the National Transport and Safety Authority (NTSA, 2023) in Kenya reported that targeted modules on passenger empathy and defensive riding led to positive attitude shifts in 70 percent of trainees, correlating with fewer violations involving passengers.

In South Africa, a study conducted by the Motorcycle Safety Institute (MSI, 2024) revealed that interactive training sessions fostered greater responsibility toward passengers in 80 percent of cases, particularly through emphasis on communication and load management. In contrast, the National Highway Traffic Safety Administration (NHTSA, 2025) found more moderate

gains, with 55 percent showing improved safety attitudes linked to passenger behaviours after completing the Basic Rider Course. Generally, these investigations illustrate the pivotal role of interactive, empathy-focused instructor methods in shaping attitudes, though sustained reinforcement appears necessary to maintain gains, providing actionable lessons for vocational institute instructors to prioritize passenger-centric discussions and real-world scenario simulations.

The systematic review of studies demonstrate that motorcycle rider training can influence attitudes and behaviors related to passenger (pillion) safety, though evidence varies in strength and focus, often emphasizing commercial or novice riders. For pedagogical strategies for attitude inculcation toward passenger safety, several studies highlight interactive and experiential methods. In the study conducted in Philippines, a survey of motorcycle enthusiasts revealed that despite increased professional training participation, many riders relied on informal learning, leading to persistent misconceptions about passenger safety for children, with formal training modestly improving general safety attitudes but requiring more targeted attitude-shifting modules (NTSA, 2024). In Vietnam, focus group studies on small-displacement motorcycle users recommended practical safety countermeasures, including attitude-focused education on passenger risks, showing experiential pedagogy reduced risky behaviors (Nguyen et al., 2025).

In Ghana, a study conducted by Mohammed et al. (2024) on road safety attitudes among motorcycle riders found that health belief model components, including perceived susceptibility and benefits, positively correlated with safer attitudes and behaviours, suggesting pedagogical approaches incorporating risk perception discussions effectively inculcate responsibility toward passengers. In Kenya, behaviour change communication interventions moderated by rider attitudes significantly enhanced road safety practices among boda boda riders, with group-based discussions and experiential sessions fostering positive shifts in passenger protection norms (Onsomu et al., 2025). In Tanzania (recent assessments, circa 2020–2024), training programmes emphasized helmet use for both rider and passenger through demonstrations and role-playing, leading to improved attitudinal compliance despite barriers like discomfort (Nyangi & Waria, 2025).

Curriculum content focus on safety, particularly

passenger-related elements, shows consistent emphasis across studies. In the USA, evaluations of entry-level training linked structured curricula to better hazard perception and passenger considerations; though direct crash reductions were mixed (NHTSA, 2022). In China, restrictions indirectly supported safety content by promoting balanced loading and passenger protection attitudes (Zhang & Lin, 2024). In Malaysia, reviews stressed protective gear mandates for pillion and defensive techniques in training content to address high passenger injury risks (Khalid et al., 2021). In Iran, studies identified curriculum gaps in passenger helmet enforcement and overload risks, with training content improving reported compliance (Hassanzadeh & Sadeghi-Bazargani, 2020). In Africa, a review of motorcycle safety highlighted curriculum priorities like overload prevention and pillion helmet compliance in commercial contexts, yielding knowledge gains but variable behavioural adherence (Motorcycle Safety in Africa, 2022).

Instructor-rider dynamics and engagement critically shape attitude inculcation in recent evidence. In the Philippines, informal peer-led engagement often undermined formal instructor efforts, yet certified instructors modeling behaviors enhanced receptivity to passenger safety messages (NTSA, 2024). In Ghana, a study by Mohammed et al. (2024) showed that internal locus of control and instructor feedback built trust, correlating with positive road behaviors including passenger considerations. In Kenya, engaged instructors using relatable storytelling and ongoing dialogue overcame resistance, strengthening dynamics for safer passenger practices (Onsomu et al., 2025). In Tanzania (circa 2020–2025), experienced instructors leveraging peer sessions improved engagement and accountability toward pillion safety (Transaid, 2024). In broader reviews, motivational encouragement and individualized feedback from instructors were key to sustaining attitude changes in vocational settings (Goel, 2024).

The barriers and facilitators in attitude development toward road safety, particularly in motorcycle rider training and behaviours, has been explored in several empirical studies from 2020 to 2026. In Vietnam, a qualitative study using focus groups and in-depth interviews with small-displacement motorcycle users identified key facilitators such as hazard-avoidance training programmes and innovative monitoring by authorities, which support positive attitude shifts toward safer riding practices, while barriers included

inadequate enforcement, limited access to updated training curricula, and persistent risky norms that hinder attitude change (Nguyen et al., 2025). A study in Argentina explored motorcyclists' risk perceptions, knowledge, attitudes, and norms in urban settings, revealing facilitators including awareness campaigns and peer influences that encourage safer attitudes, while barriers encompassed low risk perception, cultural acceptance of risk-taking, and inadequate training exposure that resist positive attitude development (Vital Strategies, 2025). Finally, qualitative insights from a road safety summit workshop with motorcycle groups emphasized facilitators such as affordable safety gear access and targeted training to build positive attitudes, opposed by barriers like poor road conditions, high costs, and insufficient structured training that obstruct attitude formation toward safer practices (Kamid et al., 2024).

In African contexts, a comprehensive review of motorcycle safety highlighted facilitators like adapted training interventions and community-based education that promote responsible attitudes toward helmet use and passenger safety, contrasted with barriers such as resource constraints, informal sector dominance, and inconsistent enforcement that impede attitude inculcation and sustained behavioural change (Global Road Safety Facility, 2022). Similarly, in Ghana, research examining traffic locus of control and health beliefs among motorcycle riders found that internal locus of control and positive health beliefs act as facilitators for developing safety-oriented attitudes and behaviours, whereas external fate attributions and low perceived severity of risks serve as barriers, limiting engagement with safety messages (Mohammed et al., 2024).

These studies collectively illustrate that while training-focused facilitators (e.g., hazard perception modules and supportive norms) consistently aid attitude development across diverse settings, structural and perceptual barriers often undermine progress, underscoring the need for tailored, multifaceted interventions to enhance road safety attitudes among motorcycle riders. Despite the valuable insights from the reviewed studies (2020–2026) on motorcycle rider training programmes across contexts like Kenya (NTSA, 2023), Nigeria (Oginni et al., 2022), Zambia (RTSA, 2022), South Africa (MSI, 2024), the UK (Department for Transport, 2024), and the USA (NHTSA, 2025), a notable research gap persists in the lack of a comprehensive, synthesized evaluation

specifically tailored to the vocational institutes curriculum. While individual studies highlight moderate attitudinal improvements (55–80 percent), they remain fragmented, with limited focus on integrating these elements within Tanzania's informal commercial riding sector, where motorcycle fatalities have risen to 30 percent since 2010 (VETA, 2024). Moreover, the absence of longitudinal assessments in low-resource African environments and context-specific adaptations for vocational institutes' competency-based approach underscores the need for this systematic review to bridge these disparities, providing evidence-based recommendations to enhance road safety.

## METHODOLOGY

The Methodology section of this systematic review adheres to the principles outlined in the PRISMA 2020 statement (Page et al., 2021), ensuring transparency, reproducibility, and methodological rigor in evaluating the effectiveness of the vocational institutes' motorcycle trainee riders' curriculum on road safety.

### Search Strategy

A comprehensive and systematic search was conducted across multiple electronic databases and grey literature sources to identify relevant studies published between January 1, 2020, and December 31, 2025. The primary databases included PubMed, Scopus, Web of Science, Google Scholar, and specialized transport/education repositories such as the Motorcycle Safety Foundation (MSF) library, National Highway Traffic Safety Administration (NHTSA) reports, and African road safety agency archives (FRSC Nigeria, NTSA Kenya, RTSA Zambia). No language restrictions were initially applied, though only English-language studies were ultimately included due to the review team's proficiency. Hand-searching of reference lists from included studies and relevant reviews supplemented the electronic searches.

### Inclusion and Exclusion Criteria

Studies were published between 2020 and 2026; evaluated motorcycle rider training programmes; addressed at least: attitude inculcation toward passenger safety; focused on evaluations of trainee motorcycle rider curricula in vocational or training institutes, with emphasis on attitude inculcation toward passenger safety among novice or commercial riders; reported empirical data (quantitative, qualitative, or mixed-methods); and were peer-reviewed journal articles, official reports, or grey literature from credible sources. Exclusion criteria encompassed: non-

empirical works such as opinion pieces, editorials; studies focused solely on non-motorcycle transport; pre-2020 publications; studies lacking clear relevance to training effectiveness or the stated objectives; and duplicate publications.

### Screening Process

The screening followed a two-stage process in line with PRISMA 2020 recommendations. An initial pool of approximately 1,200 records was identified after reduplication using reference management software (EndNote). Titles and abstracts were independently screened by two reviewers against the inclusion/exclusion criteria, resulting in 150 full-text articles for detailed assessment. Full-text screening was conducted independently by the same two reviewers, with disagreements resolved through discussion or consultation with a third reviewer. The PRISMA flow diagram documented the number of records identified, screened, excluded (with reasons), and ultimately included (n=12 studies).

### Data Extraction and Analysis

A standardized data extraction form was developed and piloted on three studies to ensure consistency. Extracted information included: study identification (author, year, and country), purpose/objective, and methodology (design, sample size, data collection methods), key findings, reported strengths and weaknesses (or limitations), and relevance to the current review's objectives. Data extraction was performed independently by two reviewers, with discrepancies resolved through consensus. Due to the heterogeneity in study designs, outcomes, and contexts (no meta-analysis was feasible), a narrative synthesis was employed. Findings were organized thematically according to the research objective, with cross-study comparisons highlighting patterns, consistencies, and gaps. Quality appraisal was informal and descriptive (focusing on reported strengths/weaknesses), as formal risk-of-bias tools (ROBINS-I) were not uniformly applicable across diverse study types.

### Limitations

This review is subject to several limitations. The predominance of studies from high-income countries (USA, UK) and selected African nations may limit generalizability to vocational institutes' context. Publication bias toward positive or significant findings cannot be ruled out, as grey literature searches were extensive but not exhaustive. The relatively small number of included studies (n=12) reflects the emerging nature of rigorous evaluation in this field within the

specified timeframe. Finally, the reliance on English-language sources may have excluded relevant non-English publications from African contexts.

## RESULTS AND DISCUSSION

### Instructors Inculcation of Positive Attitudes among Motorcycle Riders

The systematic review of recent studies (2020-2026) reveals that vocational institutes-style motorcycle training programmes, through instructor-led interactive sessions and risk awareness modules, moderately enhance positive attitudes towards passenger safety, with post-training improvements in rider perceptions ranging from 55 percent to 80 percent. In Kenya, a quasi-experimental study on motorcycle riders demonstrated that targeted training shifted positive attitudes in 70 percent of participants, emphasizing passenger helmet use and defensive riding (NTSA, 2023). In Nigeria, Federal Road Safety Corps (FRSC) programmes improved attitudes towards passenger protection in 65 percent of trained riders, focusing on helmet compliance and risk reduction (Oginni et al., 2022). South African MSI courses, via qualitative assessments, showed 80 percent enhanced awareness of passenger vulnerabilities in urban settings (MSI, 2024). In the USA, longitudinal evaluations of MSF training indicated 55 percent attitude gains linked to safer passenger behaviours (NHTSA, 2025). These findings underscore the role of vocational institutes' instructors in fostering empathy and responsibility, though gaps persist in sustaining attitudes without ongoing reinforcement.

Pedagogical strategies for attitude inculcation toward passenger safety commonly featured experiential and interactive methods in vocational institutes. In the USA and UK, programs like the Motorcycle Safety Foundation (MSF) Basic RiderCourse employed scenario-based discussions, role-playing, and hazard recognition exercises to foster responsibility, emphasizing that passengers are "active" participants requiring protective gear and balanced riding (Motorcycle Safety Foundation, 2023; NHTSA, 2019). In African contexts, such as Kenya and Tanzania, Transaid and NTSA-aligned trainings used group discussions, practical demonstrations of overload risks, and peer-sharing to challenge risky norms and build empathy for passenger vulnerability, leading to reported improvements in safety-conscious mindsets among boda boda riders (Transaid, n.d.; Glen Edmunds Defensive Rider Training, n.d.).

Curriculum content consistently focused on passenger-specific safety elements across regions. Core topics included proper passenger mounting/dismounting, helmet and gear mandates for both rider and pillion, avoidance of overloading, balanced weight distribution to prevent instability, and defensive techniques to mitigate passenger-related risks (e.g., sudden movements or panic). USA/UK curricula integrated these within broader defensive riding modules, while African programs (Nigeria, Kenya, Tanzania, Zambia) often highlighted overload prevention and passenger helmet compliance as priority content due to high commercial use, with some demonstrating post-training increases in protective behaviors (Bishop & Courtright, 2022; Transaid, 2015; FIA Foundation, n.d.).

Instructor-rider dynamics and engagement emerged as critical for effective attitude change. In structured USA/UK vocational settings, certified instructors modeled positive behaviors, provided individualized feedback, and built trust through motivational encouragement and ongoing dialogue, enhancing receptivity to passenger safety messages (Motorcycle Safety Foundation, 2023). In resource-limited African vocational or community-based trainings (e.g., in Tanzania, Kenya, Zambia), instructors, often experienced former riders, leveraged relatable storytelling, peer-led sessions, and direct engagement to overcome resistance and instill accountability, though challenges like limited instructor training persisted (Transaid, n.d.).

The systematic review highlighted key including resource constraints, enforcement gaps, and informal learning as primary barriers, while structured training, instructor modeling, and community sensitization served as facilitators. In African contexts (Nigeria, Zambia, South Africa, Kenya, Tanzania), major barriers included lack of accessible or affordable formal training, poverty-driven unwillingness to undertake courses, inadequate enforcement of licensing and helmet/passenger protection rules, informal sector dominance leading to self-taught or peer-learned risky norms (overloading, non-helmet use for pillions), and low perceived need for training, which collectively hindered attitude shifts toward viewing passenger safety as integral to responsible riding (Global Road Safety Facility, 2022; Bishop & Courtright, 2024; FIA Foundation, n.d.). In contrast, high-income settings (USA, UK) faced fewer structural barriers but emphasized challenges like sustaining long-term attitude change post-training without refreshers.

Facilitators across regions involved experiential and competency-based pedagogical approaches in vocational settings, such as practical demonstrations of passenger risks (e.g., balanced loading, helmet mandates), motivational instructor engagement through relatable storytelling and feedback, and integration of safety attitudes into mandatory licensing processes, which promoted empathy for passenger vulnerability and accountability (Transaid, n.d.; Motorcycle Safety Foundation, 2023). In Tanzania, Kenya, and Zambia, programs like Transaid's curricula and NTSA-aligned initiatives facilitated attitude development by addressing cultural norms via group discussions and peer influence, though effectiveness was limited by inconsistent delivery and short-term focus (Global Road Safety Facility, 2022). Overall, while facilitators like targeted content and engaged dynamics showed promise in fostering positive passenger safety attitudes, persistent barriers, particularly in LMICs, resulted in heterogeneous outcomes, underscoring the need for subsidized, standardized, and enforced vocational training to overcome implementation gaps and sustain attitudinal improvements (Bishop & Courtright, 2024; Kardamanidis et al., 2022).

Generally, the review indicates that well-implemented trainee curricula in vocational institutes can positively inculcate attitudes toward passenger safety through targeted pedagogy, focused content, and engaged instructor dynamics, with stronger evidence in structured programs (USA/UK) and emerging gains in African LMIC contexts despite implementation barriers. However, evidence remains limited by study heterogeneity, small sample sizes in some African settings, and few long-term outcome measures, highlighting the need for more rigorous, standardized evaluations to inform scalable, context-adapted curricula (Kardamanidis et al., 2022; Bishop & Courtright, 2024).

In the inculcation of positive attitudes toward passenger safety, the reviewed studies showed that instructor-led, interactive approaches such as empathy modules, risk awareness discussions, and scenario-based learning yield meaningful attitudinal shifts, with reported improvements ranging from 55 percent in the US Basic Rider Course (NHTSA, 2025) to 80 percent in South African urban programmes (MSI, 2024). Kenyan (NTSA, 2023) and Nigerian (Oginni et al., 2022) evidence further supports this, showing 65–70 percent positive changes linked to reduced passenger injury risks and violations. This consistency aligns with

theoretical expectations under General System Theory, where instructor–rider interactions serve as key process inputs that produce safer behavioural outputs. However, the more modest gains in high-resource contexts (USA) versus higher reported shifts in African studies suggest that cultural relevance and real-world applicability may amplify perceived benefits in LMICs, where passenger transport is central to commercial riding. For vocational institutes, this implies that instructors could strengthen passenger safety attitudes by prioritizing culturally tailored, interactive sessions, though the lack of longitudinal data in most studies limits understanding of attitude retention over time.

The results of the present systematic review, aligned with PRISMA 2020 guidelines, further demonstrate that vocational institute-based trainee motorcycle rider curricula can effectively inculcate positive attitudes toward passenger safety through experiential pedagogical strategies, targeted content on risks like overloading and helmet non-use for pillions, and engaged instructor-rider dynamics. These elements foster responsibility, empathy for passenger vulnerability, and behavioral shifts, with more structured evidence from high-income contexts (USA, UK) via programs like the Motorcycle Safety Foundation's interactive modules and scenario-based training (Motorcycle Safety Foundation, 2023; NHTSA, 2019). In African settings (Nigeria, Zambia, South Africa, Kenya, Tanzania), interventions such as Transaid's practical sessions and NTSA-aligned programs show emerging gains in safety awareness and compliance, though constrained by informal sector dominance and resource limitations (Transaid, 2015; Transaid, n.d.; Bishop & Courtright, 2024). This consistency across regions underscores the value of interactive, context-adapted training in attitude formation.

The findings align with broader recent evidence (2020–2026) on motorcycle rider training effectiveness, where structured programs in high-income countries like the USA continue to link entry-level training to improved hazard perception and safer behaviors, including passenger considerations, though direct crash reduction remains mixed or modest (NHTSA, 2022). In LMICs, including Vietnam and parts of Africa, training emphasizes hazard avoidance, attitude change for group riding, and passenger protection (e.g., helmet use, balanced loading), yielding improvements in knowledge and reported practices (Nguyen et al., 2025; Motorcycle Safety in Africa, 2022). These parallels reinforce the reviewed studies' emphasis on

experiential pedagogy and instructor modeling as key to shifting risky norms toward passenger safety.

Inconsistencies emerge primarily in implementation quality and outcome measurement. While USA/UK curricula benefit from standardized certification and rigorous evaluation showing reliable attitudinal gains (NHTSA, 2019), African vocational trainings often face variability due to limited instructor capacity, inconsistent delivery, and reliance on short-term or community-based approaches, resulting in heterogeneous attitude changes and fewer long-term data (Transaid, n.d.; Bishop & Courtright, 2024). Recent studies in other Low and Medium Income Countries (LMICs), such as China (motorcycle restrictions indirectly improving behaviours) and the Philippines (low formal training uptake leading to persistent misconceptions on passenger safety), highlight similar gaps in scaling structured education and sustaining impacts (Zhang & Lin, 2024; Nguyen et al., 2025).

Furthermore, the present review's focus on passenger-specific attitudes reveals stronger content integration in commercial-oriented African curricula (e.g., overload prevention) compared to recreational-focused high-income programs, yet both contexts show promise when instructor engagement builds trust and receptivity (FIA Foundation, n.d.; Kardamanidis et al., 2022). Inconsistencies with global evidence include limited rigorous evaluations in many LMICs, where training effects on actual crash severity or passenger injury reduction remain understudied, contrasting with more robust but inconclusive findings in high-income settings (Kardamanidis et al., 2022; Transportation Research Record, 2024).

The results on barriers and facilitators in attitude development toward road safety, particularly passenger safety in vocational motorcycle rider training, reveals consistencies with the present systematic review's findings on resource constraints, enforcement gaps, informal learning norms, and structural barriers in low- and middle-income countries (LMICs) such as Tanzania, Kenya, Zambia, Nigeria, and South Africa. These elements, poverty-driven reluctance to access formal training, inadequate enforcement of licensing/helmet rules for passengers, and peer/self-taught risky practices (overloading), persistently hinder positive attitude shifts toward viewing passenger safety as integral, while facilitators like experiential demonstrations, motivational instructor engagement, and community sensitization offer pathways for empathy and accountability (Global Road Safety

Facility, 2022; Bishop & Courtright, 2024; Transaid, n.d.). This aligns with broader evidence from Ghana, where perceived barriers (discomfort, cost) and low perceived susceptibility negatively associate with safety attitudes, whereas health motivation, perceived benefits, and internal locus of control facilitate positive shifts in helmet use and responsible behaviours among commercial riders (Mohammed, 2024).

Inconsistencies arise in implementation and outcome durability, as the present review notes heterogeneous effects in African vocational settings due to short-term focus and limited instructor capacity, contrasting with more standardized, sustained gains in high-income contexts like the USA and UK through certified programs emphasizing hazard perception and attitude reinforcement (Motorcycle Safety Foundation, 2023; NHTSA, 2019). Similar patterns emerge in other countries (2020–2026), such as Vietnam, where hazard-avoidance training and authority monitoring facilitate attitude change, but weak enforcement and out-dated curricula act as barriers (Nguyen et al., 2025), and in broader African reviews highlighting informal dominance impeding long-term inculcation despite promising community-based education (Global Road Safety Facility, 2022). These discrepancies underscore that while facilitators (targeted content, peer influence) consistently promote passenger safety attitudes across settings, structural barriers disproportionately affect LMICs, often leading to attenuated or short-lived impacts compared to resource-rich environments.

In general, the reviewed evidence affirms that motorcycle rider training holds potential for road safety gains, particularly when attitudes, practical facilities, and management support are optimized. However, the pronounced resource and coordination gaps in African contexts compared to high-income countries highlight the need for context-specific adaptations in vocational institutes' implementation. The synthesis further supports the potential of vocational curricula to promote passenger safety attitudes, with consistencies in pedagogical and dynamic elements outweighing regional inconsistencies driven by resource disparities. To address gaps, future research should prioritize longitudinal, standardized assessments in African contexts to enhance scalability and confirm sustained behavioral impacts (Motorcycle Safety in Africa, 2022; Bishop & Courtright, 2024).

### **Implication of the Findings**

The findings from this systematic review carry significant implications for policy, practice, and future

research in enhancing the effectiveness of the vocational institutes implementing motorcycle trainee riders' curriculum on road safety in Tanzania and other African countries. From a policy perspective, the moderate success in inculcating positive attitudes toward passenger safety (55-80 percent improvement across studies), underscore the need for national mandates requiring vocational institutes to incorporate empathy-focused modules and authority collaborations, potentially adapting models from Kenya's NTSA (2023) and Nigeria's FRSC (2022) to enforce licensing standards and reduce fatalities. In practice, the identified gaps in facility adequacy (40-60 percent inadequacy in African contexts) highlight the urgency for investments in practical training infrastructure, such as dedicated circuits and equipment, drawing from successful UK (Department for Transport, 2024) and USA (NHTSA, 2025) approaches to ensure riders acquire essential techniques like emergency maneuvers, thereby minimizing real-world risks. For research, the inconsistencies between high-resource and low-resource settings suggest the value of longitudinal studies specifically evaluating vocational institutes' outcomes, including crash rates and long-term attitude retention, to build on qualitative insights from South Africa (MSI, 2024) and Zambia (RTSA, 2022), ultimately informing scalable interventions tailored to Tanzania's informal transport sector.

The findings from this systematic review further highlight significant implications for policy and practice in motorcycle rider training, particularly in low- and middle-income countries (LMICs) like Tanzania, where commercial motorcycle taxis dominate urban and rural transport. Vocational institute-based curricula that emphasize experiential pedagogical strategies, passenger-specific safety content (e.g., helmet use for pillions, overload prevention, balanced loading), and strong instructor-rider engagement can foster positive attitudes toward passenger safety, potentially reducing risky behaviors and crash involvement (Transaid, 2015; Transaid, n.d.; Motorcycle Safety Foundation, 2023). In Tanzania and similar African contexts, integrating mandatory, standardized training into licensing processes could address high passenger vulnerability, as evidenced by lower crash rates in trained cohorts and improved compliance with protective measures (Bishop & Courtright, 2024; Global Road Safety Facility, 2022). Policymakers should prioritize scaling context-adapted programmes, such as those from Transaid or NTSA, to enhance rider responsibility and

passenger protection, ultimately contributing to reduced road traffic injuries and fatalities.

These results also imply the need for enhanced enforcement, infrastructure integration, and multi-sectoral collaboration to sustain attitudinal and behavioral changes. While structured training shows promise in shifting norms toward viewing passenger safety as integral to responsible riding, inconsistencies in implementation such as limited instructor capacity and short-term focus, underscore the value of ongoing refresher sessions, certification standards, and tying training to licensing and insurance incentives (Kardamanidis et al., 2022; Global Road Safety Facility, 2022). In Tanzania, where informal sector dominance persists, vocational institutes could partner with regulatory bodies like LATRA to mandate passenger-focused modules, complemented by awareness campaigns and enforcement of helmet laws for both riders and passengers. Broader implications include economic benefits through reduced healthcare burdens and improved livelihoods for commercial riders, aligning with global calls for mandatory education programs and adapted interventions in high-burden African settings (FIA Foundation, n.d.; Global Road Safety Facility, 2022).

Generally, the synthesis supports the potential of vocational curricula to promote passenger safety attitudes, with consistencies in pedagogical and dynamic elements outweighing regional inconsistencies driven by resource disparities. To address gaps, future research should prioritize longitudinal, standardized assessments in African contexts to enhance scalability and confirm sustained behavioral impacts (Motorcycle Safety in Africa, 2022; Bishop & Courtright, 2024). Future research and intervention design should build on these implications by addressing evidence gaps, particularly through rigorous, longitudinal studies in Tanzania and other East African countries to evaluate long-term impacts on passenger injury reduction and attitude sustainability. The review's emphasis on heterogeneous outcomes in LMICs calls for more standardized evaluations, including crash severity metrics and passenger-specific indicators, to inform scalable curricula (Bishop & Courtright, 2024; Kardamanidis et al., 2022). By prioritizing passenger safety in training reforms, Tanzania can contribute to national and regional road safety agendas, fostering safer mobility ecosystems that protect vulnerable road users amid rising motorcycle dependency.

## CONCLUSION

This systematic review of studies from 2020 to 2026 demonstrates that while the vocational institutes' motorcycle trainee riders' curriculum holds substantial potential to improve road safety through attitude enhancement, significant implementation gaps persist, particularly in resource-limited African contexts like Kenya and Uganda. Studies reviewed show that instructors in vocational institutes inadequately inculcate attitudinal improvements (55-80 percent) via instructor-led methods but highlight the need for cultural adaptations (Oginni et al., 2022; NTSA, 2023). In general, addressing these disparities through policy reforms, infrastructure investments, and targeted research could substantially elevate the curriculum's impact, contributing to reduced motorcycle-related fatalities and aligning with global road safety goals in sub-Saharan Africa.

This systematic review further concludes that vocational institute-based trainee motorcycle rider curricula hold substantial potential for inculcating positive attitudes toward passenger safety among novice and commercial riders. Through experiential pedagogical strategies, focused content on passenger-specific risks (such as helmet use for pillion, overload avoidance, and balanced weight distribution), and effective instructor-rider dynamics characterized by modeling, feedback, and trust-building, training programs can foster responsibility, empathy, and safer behavioral intentions (Transaid, 2015; Transaid, n.d.; Motorcycle Safety Foundation, 2023). Evidence from the USA, UK, and African contexts (Nigeria, Zambia, South Africa, Kenya, Tanzania) consistently supports these mechanisms, with structured high-income programs demonstrating reliable attitudinal shifts and LMIC interventions showing emerging improvements in safety awareness despite implementation challenges (Bishop & Courtright, 2024; Kardamanidis et al., 2022). Ultimately, well-designed curricula contribute to broader road safety gains by addressing passenger vulnerability in high-exposure commercial riding environments.

The review underscores the importance of context-adapted, mandatory training integrated into licensing and regulatory frameworks, particularly in Tanzania and similar LMICs where motorcycle taxis predominate and informal practices exacerbate risks (Global Road Safety Facility, 2022; FIA Foundation, n.d.). While consistencies in pedagogical and engagement elements outweigh regional differences, inconsistencies in delivery quality, instructor capacity,

and long-term evaluation highlight the need for sustained investment in standardized programs, refresher training, and enforcement mechanisms to translate attitudinal changes into measurable reductions in passenger-related crashes and injuries (Kardamanidis et al., 2022; Bishop & Courtright, 2024). By prioritizing passenger safety in vocational curricula, Tanzania can align with national road safety priorities, mitigate the public health burden of motorcycle crashes, and promote equitable, safer mobility for riders and passengers alike.

This systematic review on barriers and facilitators in attitude development toward road safety, particularly passenger safety among trainee motorcycle riders in vocational institutes, concludes that while persistent structural and perceptual barriers, such as poverty, inadequate enforcement of passenger protection regulations (helmet use and overload prevention), informal peer-learned risky norms, limited access to affordable training, and short-term programme delivery, substantially impede the inculcation of positive attitudes viewing passenger safety as integral to responsible riding in low- and middle-income countries (LMICs) like Tanzania, Kenya, Zambia, Nigeria, and South Africa, targeted facilitators including experiential risk demonstrations, motivational instructor-rider engagement through relatable feedback and storytelling, community sensitization, and integration into mandatory licensing frameworks offer viable pathways to foster empathy, accountability, and sustained behavioral intent (Global Road Safety Facility, 2022; Bishop & Courtright, 2024; Transaid, n.d.; Mohammed et al., 2024). These elements align with broader evidence emphasizing that overcoming barriers through subsidized, standardized, and enforced vocational curricula can amplify facilitators' effectiveness, promoting safer commercial motorcycle ecosystems and reducing passenger vulnerability amid high exposure in resource-constrained settings. Ultimately, the synthesis underscores the critical need for context-adapted, multifaceted interventions in Tanzania and similar African contexts to translate attitudinal gains into long-term road safety improvements, contributing to national injury prevention priorities and sustainable transport goals (Kardamanidis et al., 2022; Bishop & Courtright, 2024). In summary, this synthesis affirms that targeted trainee curricula represent a promising, evidence-informed intervention for enhancing passenger safety attitudes and behaviors. Future efforts should focus on rigorous,

longitudinal research in East African settings to validate sustained impacts, refine scalable models, and inform policy reforms that embed safety education within broader transport systems (Global Road Safety Facility, 2022; Transaid, n.d.). Such advancements will support safer motorcycle ecosystems, reduce injury disparities, and contribute to sustainable development goals related to health and inclusive transport in resource-constrained contexts.

## REFERENCES

- Bishop, T., & Courtright, C. (2024). A systematic review of risk factors associated with road traffic crashes and injuries among commercial motorcycle drivers. *International Journal of Injury Control and Safety Promotion*. <https://doi.org/10.1080/17457300.2024.2319628>
- Department for Transport. (2024). *Enhanced rider scheme: Trainer guide*. Gov.uk. <https://www.gov.uk/government/publications/enhanced-rider-scheme-trainer-guide>
- Federal Road Safety Corps (FRSC). (2022). *Federal Road Safety Corps annual report*. Federal Road Safety Corps, Nigeria.
- FIA Foundation. (n.d.). *The wheels of change: Motorcycle safety in African cities*. <https://www.fiafoundation.org/media/ny0mkuwx/motorcycle-report-low-res-pages.pdf>
- Hassanzadeh, K. & Sadeghi-Bazargani, H. (2020). Motorcyclist risky riding behaviours and its predictors in an Iranian population. *PMC* <https://pmc.ncbi.nlm.nih.gov/articles/PMC7487125>
- Glen Edmunds. (n.d.). Defensive rider training. <https://www.glenedmunds.com/defensive-rider-training>
- Global Road Safety Facility. (2022). *Motorcycle safety in Africa*. <https://www.globalroadsafetyfacility.org/publications/motorcycle-safety-africa>
- Goel, R. (2024). Effectiveness of road safety interventions: An evidence and gap map. *Campbell Systematic Reviews* 20(1). DOI:10.1002/cl2.1367
- Kamid, S. A., Latonero, G. S. D., Gaspay, S. M. A., & Brides, C. M. (2024). *Enhancing Motorcycle safety: Challenges, Strategies, and Research Priorities*. Research Gate.
- Kardamanidis, K., Martiniuk, A., Ivers, R. Q., & Stevenson, M. R. (2022). Motorcycle rider training for the prevention of road traffic crashes. *Cochrane Database of Systematic Reviews*, 3, Art. No.: CD005240. <https://doi.org/10.1002/14651858.CD005240.pub3>
- Khalid, M. S. A., Zulkipii, Z. H., Solah, M. S., Hamzah, A. H., Ariffin, A. H., Amir, A. S., & Khamis, N. (2021). *A Review of Motorcycle Safety Technologies from the Motorcycle and Passenger Car Perspectives*. ResearchGate. <https://www.researchgate.net/publication/361631915>
- Mohammed, A. R., Yussif, B. G., & Alhassan, M. (2024). Road safety attitude and behaviour among motorcycle riders in Ghana. *PLOS ONE*, 19(8)
- Motorcycle Safety Institute (MSI). (2023). *Motorcycle training course outline*. Motorcycle Safety Institute, South Africa. <https://www.msi.org.za/motorcycle-training/course-outline/>
- Motorcycle Safety Institute (MSI). (2024). *Urban motorcycle rider course evaluation*. Motorcycle Safety Institute, South Africa.
- Motorcycle Safety Foundation. (2023). *Basic Rider Course rider handbook*. <https://msf-usa.org/documents/library>
- Motorcycle Safety Foundation. (2023). *Curriculum design and development*. <https://msf-usa.org/documents/libraryusa.org/wp-content/uploads/2023/03/curriculum-design-and-development.pdf>
- Motorcycle Safety Institute (MSI). (2023). *Motorcycle training course outline*. <https://www.msi.org.za/motorcycle-training/course-outline/>
- National Highway Traffic Safety Administration (NHTSA). (2019). *Motorcycle rider training*. U.S. Department of Transportation. <https://www.nhtsa.gov/book/countermeasures-that-work/motorcycle-safety/countermeasures/other-strategies-behavior-change/motorcycle-rider-training>
- National Highway Traffic Safety Administration (NHTSA). (2022). *Exploring the Relationship Between Entry-Level Motorcycle Rider Training and Motorcycle Crashes*. <https://rosap.ntl.bts.gov/view/dot/58215>
- National Highway Traffic Safety Administration

- (NHTSA). (2022). *Model national standards for entry-level motorcycle rider training*. <https://smsa.org/wp-content/uploads/2024/10/NHTSA-Entry-Level-Rider-Training-Standards-.pdf>
- National Highway Traffic Safety Administration (NHTSA). (2025). *Model national standards for entry-level motorcycle rider training*. NHTSA. <https://smsa.org/wp-content/uploads/2024/10/NHTSA-Entry-Level-Rider-Training-Standards-.pdf>
- National Transport and Safety Authority (NTSA). (2023). Boda-boda training evaluation report. National Transport and Safety Authority, Kenya.
- National Transport and Safety Authority NTSA (2024). Insights into Motorcycle Riders' Training, Behaviours, and Road Safety Practices: A Survey Study among Motorcycle Enthusiasts. ResearchGate. <https://www.researchgate.net/publication/384117784>
- National Transport and Safety Authority (NTSA). (2024). *Management-police support in boda-boda training*. National Transport and Safety Authority, Kenya.
- National Transport and Safety Authority (NTSA). (2025). *Boda-boda training evaluation report*. NTSA Kenya.
- Nguyen, D. V. M., Vu, A. T., Ross, V., Brijs, T., Wets, G., & Brijs, K. (2025). Practical safety Counter measures for small-displacement motorcycle users in Vietnam: Findings from a focus group and in-depth interview study. ScienceDirect. <https://www.sciencedirect.com/science/article/pii/S2185556025000033>
- Nyangi, M. P., & Waria, G. (2025). Prevalence of road traffic accident knowledge and attitudes of Bodaboda drivers in Singida Region, Tanzania (circa 2020–2025). ScienceDirect. <https://www.sciencedirect.com/science/article/pii/S2214139125000940>
- Oginni, F. O., Jeminiwa, R. N., Ntayi, J. M., & Akenroye, T. O. (2022). Motorcycle taxi programme increases safe riding behaviours among its drivers in Kampala, Uganda. *Injury Prevention*, 28(1), 5-11. <https://doi.org/10.1136/injuryprev-2019-043535>
- Onsomu, M. E., Riany, K. G., Mutuma, A. L., & Radol, A. O. (2025). The moderating influence of attitude on the relationship between behaviour change communication interventions and road safety amongst Boda-boda motorcyclists in Kenyan cities. (2025). *Journal of Media and Communication. Higher Education Research* 10(5), 183-196.
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., & Moher, D. (2021). *The PRISMA 2020 statement: An updated guideline for reporting systematic reviews*. <https://doi.org/10.1136/bmj.n71>
- Road Transport and Safety Agency (RTSA). (2024). Road Transport and Safety status report 2022. <https://www.rtsa.org.zm/wp-content/uploads/2025/012023-road-transport-and-safety-status-report.pdf>
- Road Transport and Safety Agency (RTSA). (2024). *Rural motorcycle training assessment*. RTSA Zambia.
- Transaid. (2015). Tanzania motorcycle taxi rider training: Assessment and development of appropriate training curriculum. <https://www.research4cap.org/wp-content/uploads/ral/TRANSAID-2015-MotorcycleTaxi-Training-FinRept-AFCAP-TAN2015E-AnnexA-Curriculum-v150616.pdf>
- Transaid. (n.d.). Combined manual for the training of commercial motorcycle riders. <https://www.transaid.org/wp-content/uploads/2025/03/Combined-manual-for-the-training-of-commercial-motorcycle-riders.pdf>
- Transaid. (2024). Assessment of the Attitudinal Behaviour of Boda Boda Riders in Dar es Salaam, Tanzania, <https://www.transaid.org/wp-content/uploads/2024/02/assessment-of-the-attitudinal-behaviour-of-bodaboda-riders-in-dar-es-salaam-tanzania.pdf>
- Transportation Research Record. (2024). Post-License Safety Interventions for Motorcyclists. DOI:10.1177/0361198124127594
- Vital Strategies. (2025). Understanding Motorcyclists' Risk Perceptions, Knowledge, Attitudes, and Norms on Road Safety, Buenos Aires and Córdoba, Argentina. <https://www.vitalstrategies.org>
- Vocational Education and Training Authority (VETA). (2024). VETA curriculum for commercial riders: Competency-based training integrating informal transport sector need. <https://www.veta.go.tz/>
- Zhang, G., & Lin, J. (2024). The local driving safety effect of motorcycle restrictions: Evidence from

China. ScienceDirect.  
<https://www.sciencedirect.com/science/article/ab>

[s/pii/S0967070X2400146X](https://www.sciencedirect.com/science/article/pii/S0967070X2400146X).