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The Moderating Influence of Attitude on the Relationship between Behaviour Change Communication Interventions and Road Safety amongst Boda-boda Motorcyclists in Kenyan Cities

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ABSTRACT

This study sought to determine the moderating influence of attitude on the relationship between behaviour change communication and road safety among Boda-boda motorcyclists in Kenyan cities. The study was anchored on the Social Cognitive Theory and Safety Culture Theory. The study used a pragmatic philosophical paradigm with a convergent parallel design of mixed-method research. There was an initial population of 280,000 riders, whereby the Yamane (1967) formula was employed to determine the target population of 399 Boda-boda motorcyclists from four cities in Kenya—Nairobi, Mombasa, Kisumu, and Nakuru—leading to a final sample of 387 respondents. Stratified sampling and simple random sampling were used to draw the sample. Interviews were conducted with nine key informants, purposively sampled from each city, two drawn from the NTSA office, three from the Boda-boda association, and four senior traffic police officers. Quantitative data was collected from the motorcyclists using semi-structured questionnaires, while qualitative data was gathered through key informant interviews. Descriptive and inferential statistics were used to analyse the quantitative data, while qualitative data was analysed thematically. The findings showed a positive relationship between behaviour change communication and road safety. Attitude as a moderator demonstrated $R^2 = 0.801$, p-value = 0.000 < 0.05, indicating a significant impact on predicting road safety and showing a potential synergistic effect between the two factors. BCC interventions aimed at Boda-boda motorcyclists significantly contribute to road safety. The findings will aid road safety stakeholders in crafting BCC interventions that elicit positive behaviour among motorcyclists.

Key terms: Attitudes, Behaviour Change Communication, *Boda-boda,* intervention, road safety.

INTRODUCTION

Behaviour Change Communication

BCC has been applied successfully around the world (Singh et al., 2020). BCC interventions focus on eliciting positive change that empowers targeted individuals and communities in order for them to live quality lives (Nwangu et al., 2020). The interventions used include participatory, educational and information communication. Ngigi and Busolo (2018) posit that the wide range of communication interventions by the government and its partners is key to addressing challenges in the health sector.

Behaviour change communication is a strategy used in communication to deliver multimedia messages with the intention of modifying behaviour (Kalu, 2023). The BCC strategy has been successfully used worldwide to address various concerns in society in the areas of health, education, and agriculture, among others. BCC occupies a key position in health communication, and evidence-based BCC initiatives successfully change behaviour by use of communication (Adewuyi & Adeyemi, 2016). BCC uses a wide range of tools to effect change, and they include media campaigns, Information Education and Communication (IEC), participatory communication, and visual communication, all with an aim of changing behaviour, skills and attitude (Osire, 2018).

In East Africa, the transport ministers agreed to implement the African Road Safety Charter, which was adopted in 2016 with the aim of reducing road fatalities (WHO, 2018). In terms of road fatalities, Kenya has an annual average of 27.8 per cent; Uganda has a high of 29 per cent, while Tanzania has 29.7 per cent, and Burundi has an all-time high of 34.7 per cent per 100,000 persons in the population (WHO, 2018). This clearly indicates the serious prevalence of road accidents and road safety concerns in East Africa. These regional applications highlight the broad reach and effectiveness of BCC interventions. In Kenya, similar strategies have been adapted to address specific national concerns, particularly road safety.

Ndungu (2022) undertook a study on BCC strategies and cancer screening amongst men in Kenya. The study noted that mass media were not adequately used for information dissemination, and messages were poorly framed and ineffective. Culture was also highlighted as a great influence on men's attitudes and behaviour. This study recommended the use of BCC strategies in the mitigation of health problems in society (Ndungu, 2022). BCC interventions have been used to moderate success in many instances around the world, and thus there is a need to analyse BCC interventions that address the safety challenges found on Kenyan roads amongst road users and specifically, the *boda-boda* motorcycle riders in the cities.

Behaviour Change Communication Interventions

Several behaviour change interventions (BCC) have been formulated and implemented using various communication tools in order to address public issues. Araújo-Soares et al. (2019) posit that a good BCC intervention should have an impact, and one should be able to evaluate it.

Global Perspective

Studies on BCC interventions have been conducted worldwide. In Indonesia, for instance, Rochimah & Rosyidah (2021) studied the use of behaviour change communication interventions to assist in fighting cancers that only affect women. The behaviour change communication interventions explored in the study included promoting early screening, counselling and offering assistance to women using communal and family support structures. The findings showed that behaviour change communication was effective in encouraging Indonesian women to seek early screening of cancer, especially when there was high family support for treatment. This BCC intervention elicited positive health outcomes.

Awasthi & Awasthi (2019) also undertook a BCC study in Nepal on the importance of behaviour change communication and social marketing in the prevention of HIV. The use of mass media campaigns, social marketing, peer communication, and health teaching in creating awareness and positive change was highlighted amongst large populations in a limited time frame. The researchers posited that BCC interventions played an important part in successful HIV campaigns by decreasing HIV prevalence rates and improving the quality of life amongst the population. In addition, the researchers proposed that a multiple stakeholder approach would elicit more success and sustainability.

Nagi et al. (2020) conducted a study on the different types of behaviour change interventions used by communication health workers and the study findings revealed that BCC strategies have emerged as successful strategies to promote health behaviour and reduce unhealthy behaviour. This study demonstrates the confidence found in the use of BCC strategies to address public health concerns.

In Mozambique, the Food and Agriculture Organisation (FAO) implemented a five-year (2013-2019) BCC campaign to address malnutrition amongst children in seven districts. The program used education, training, mentorship, and community engagement with mothers as behavioural change interventions. The program posted positive behaviour change in dietary engagement because mothers were now able to prepare nutritious porridge with locally available foodstuffs for their children and household members. The FAO training thus brought an increase in knowledge and, in turn, a change of behaviour (FAO, 2019). Mothers were taught how to develop and maintain gardens, in an effort to access high-quality food and live healthy lives (Cooper, 2019).

A behaviour change communication campaign was launched in 2010 to fight malaria in Tanzania, dubbed "*Zinduka*! Malaria *haikubaliki*" (Wake up! malaria is not accepted). It had renowned public figures such as the former president Jakaya Kikwete and the first lady, who participated together with other goodwill ambassadors and celebrities. Music and dance, education, radio and TV programmes were used to pass messages, and similarly, training was done in the *Zinduka* youth clubs on how to fight malaria. The BCC interventions were highly successful a year down the line, with over 94 per cent of the children sleeping under mosquito nets and 100 per cent visiting health facilities when they exhibited malaria symptoms. This campaign elicited behavioural change amongst the Tanzanians (Kahenga et al., 2020). Important to note that BCC has its fair share of challenges; Anyanwu (2014) highlights the difficulties in executing BCC programs, including cultural resistance, lack of formative research and inadequate funding.

In Uganda malaria prevention by use of long-lasting insecticidal mosquito nets elicited a study by Helinski et al. (2015), to find out the impact of BCC programmes on net durability. This study embraced community engagement, training and radio programmes to disseminate messages. The study concluded that respondents had an increase in knowledge on how to take care of mosquito nets.

Local Perspective

In Kenya, several Behaviour Change Communication (BCC) interventions have been successfully applied in various sectors. For example, Machira (2017) explored the effectiveness of BCC in reducing HIV/AIDS infection rates in the workplace. The study found that BCC messages were particularly effective in raising awareness about HIV/AIDS and promoting safer practices among employees. This underscores the power of BCC in health campaigns to foster positive behavioural change through targeted communication strategies.

Beyond health, BCC has also been applied in other areas, such as environmental conservation. Kinyua et al. (2020) studied BCC interventions in promoting environmental sustainability, particularly focusing on plastic waste management in Nairobi. The research showed that community-based campaigns, including mass media and educational workshops, led to an increased awareness of proper waste disposal and recycling practices among residents. These interventions were instrumental in improving local waste management behaviours.

Additionally, Kimani (2019) investigated the role of BCC in family planning initiatives in rural Kenyan communities. The study emphasised the importance of using culturally relevant communication approaches, such as local language radio shows and community meetings, to inform residents about family planning options. As a result, there was a notable increase in the uptake of modern contraceptives in areas where these interventions were implemented, demonstrating the effectiveness of tailored BCC strategies in health promotion.

Another example is a study by Otieno (2021) on BCC interventions in promoting road safety awareness among Kenyan drivers. The research highlighted the use of mass media campaigns and peer education to reduce road accidents, particularly in urban areas like Nairobi and Mombasa. The study showed that when

drivers are engaged with consistent and relatable safety messages, it leads to improved road behaviours, such as adherence to traffic rules and reduced speeding.

In the context of road safety, BCC interventions have proved to be effective. Odongo (2024) explored health communication campaigns and their impact on public health behaviour through desktop research. The study revealed that the interventions played a crucial role in shaping behaviour and improving health outcomes through strategic communication. Despite the proven success of BCC in health and environmental campaigns, limited research has been conducted on its application to road safety in Kenya, particularly among boda-boda riders. This paper aims to fill that gap by examining the effectiveness of BCC interventions in improving road safety behaviours in urban Kenya.

Situating Behaviour Change Communication Interventions in Road Safety

In Kenya and around the world, road users have been found to present negative behaviours like jaywalking, not wearing helmets, tailgating, and even speeding (Bonnet et al, 2018; Esse, 2021). These behaviours call for addressing through BCC interventions. Fisa (2022) posits that behaviour-based interventions are very effective in reducing road traffic accidents. Public and private stakeholders in Kenya have mitigated road safety concerns by implementing interventions. These include information, education, and communication, media initiatives, adherence to traffic law enforcement, traffic visual communication, attitude and participatory communication.

Several researchers have identified motorists' attitude and behaviour as a contributing factor of 90 to 95 percent of road traffic accidents around the world (Elvik, 2016; Muguro et al., 2020). Environmental factors (like status of road, weather) and status of the vehicle contribute to the remaining 5 percentage. By recognising the significance of attitudes and implementing targeted interventions, policy-makers and road safety advocates can promote positive attitudes that will foster a culture of responsible road usage.

LITERATURE REVIEW

Social Cognitive Theory

The social cognitive theory (SCT) was developed by the psychologist Albert Bandura in 1986 (Bandura, 2006). This theory occurs at the interpersonal level of communication and addresses the study objectives on participatory communication, IEC, traffic visual communication, and the moderating objective of attitude. The SCT metamorphosed from the social learning theory by Albert Bandura, which postulated that an individual learns through observing others in the environment (Bandura, 1997). The SCT theory was an improvement, and it continues to postulate that an individual exists within a social environment where the attitudes, thoughts and behaviour of others around influence the individual immensely. Similarly, the individual influences the social space, which comprises friends, family, colleagues and others. This entire interaction affects the attitude and behaviour of the individual. People are viewed as products of their environment, and behaviour is seen as a result of a continuous interaction between the individual, the environment and social factors which exert influence and change upon each other (Stajkovic & Stajkovic, 2019).

In the social cognitive theory, a person's perception of the environment is referred to as a "situation" because the environment can be physical, social, cultural, economic or even political in nature. The principal concept around this theory is known as reciprocal determinism (Devi et al., 2022). In this concept, a person is considered an agent of change and equally a respondent of change. The use of role models to reinforce behaviour is said to elicit healthier behaviours. Bandura (2006) continues to explain that, the person is cognitive in nature and there are personal characteristics such as demographics (age, gender, race, education), motivation, personality and cognitive factors like thoughts, attitudes, beliefs, knowledge and skills, all which contribute to an individuals' behavioural outcome.

The emotional arousal or coping ability of an individual influences behaviour because people are not only learning from the environment, but are key players and respondents. According to this theory, if an individual has control over their behaviour, they are considered to have self-efficacy. Other constructs

found in this theory include observational learning, whereby an individual learns behaviour by observing others in society (Devi, 2022). Similarly, environmental determinants mean that observing others isn't enough, but a behaviour change can only occur if the social and physical environment supports the new behaviour. The construct of self-regulation depends on the individuals' acquisition of profound skills from the environment to manage themselves. Finally, moral disengagement is the idea that learnt moral standards help individuals to avoid negative behaviour.

Bandura (1997) postulates that STC provides a good foundation for developing intervention strategies which can thereon be evaluated. Indeed, SCT therefore provides a good framework for designing implementing and evaluating programs. In this theory surveys, experiments and quasi-experiment methods of research are common. The triadic causation amongst environment, person and behaviour influences behaviour (Stojkovic & Stajkovic 2019).

The tenets of the Social Cognitive Theory (SCT) are highly relevant to this study, especially in understanding the behaviour of *Boda-boda* motorcyclists towards road safety. One of the central elements of SCT is observational learning, which plays a crucial role in influencing behaviour within a social environment. In the context of *Boda-boda* riders, observing the actions of their peers, particularly those perceived as successful or experienced, can shape their road safety practices. For instance, riders who witness others following traffic rules and benefitting from safety measures are more likely to adopt similar behaviours. Additionally, the concept of reciprocal determinism—whereby the environment, the person, and behaviour continuously influence each other—is evident as *Boda-boda* riders engage with their environment. Their social and physical surroundings, including peer influences, traffic conditions, and enforcement by authorities, contribute to shaping their safety attitudes and behaviours (Bandura, 2006; Devi, 2022).

Self-efficacy, another key construct of SCT, is crucial in promoting road safety behaviours. When *Boda-boda* motorcyclists feel confident in their ability to control their actions, such as wearing helmets or adhering to speed limits, they are more likely to engage in safe practices. This theory also highlights the role of environmental determinants, which are particularly relevant in this study. Even if a motorcyclist understands the importance of safety measures, behaviour change is more likely to occur when the physical and social environment supports these actions. For example, road signs, police presence, and community awareness campaigns can create a conducive environment that encourages safer riding practices. In this way, SCT helps to explain how various factors, including participatory communication, IEC, and traffic visual communication, are instrumental in shaping the road safety behaviours of *Boda-boda* motorcyclists (Stajkovic & Stajkovic, 2019; Bandura, 2006).

The social cognitive theory provides a valuable framework for understanding behavioural patterns as learnt by the individual in the environment. Applying this theory allows for the development of effective participatory, IEC and traffic visual communication interventions that address the underlying psychological and social factors influencing *Boda-boda* motorcyclists' behaviour towards road safety. SCT is closely linked to Social Learning Theory, which suggests that individuals adopt safety behaviours by observing peers and authority figures. It also incorporates elements of Behavioural Change Communication (BCC), emphasising how targeted messaging can shift attitudes toward safety.

Safety Culture Theory

According to Thompson and Harford (1996), safety culture is the beliefs, attitudes and values regarding the pursuit of safety in an organisation where practices, control and policy enhance safety. This theory addresses the area of road safety, which is not adequately addressed by the social cognitive theory and the uses and gratification theory. The safety culture construct aims to emphasise safety failings in organisations and also to improve occupational safety. This concept was first introduced after the Bhopal disaster in 1984 in India, where an industrial gas leak was one of the worst accidents in history, killing over twenty thousand people, with many more sustaining injuries.

The safety concerns were brought to the fore in order to understand the safety culture of our environment

and propose best practices. Benoit et al., (2018) continues the argument that culture though complex carries values, norms, beliefs and practices which greatly influence behaviour and interpretation of others. Hence embracing safe practices can become the norm in the long run.

Hudson (2000) elaborates on the characteristics of safety culture theory, which he views as having an informal culture where knowledge is available. The second characteristic is having a reporting culture where people are willing to report errors. Another key characteristic is having a just culture where the accepted and unaccepted behaviour is well demarcated. The need for a flexible and learning culture is also desirable, and so is an information system. Safety culture is not only found in the health sector, but it has been used extensively in other sectors. Several tools for measuring safety culture have been developed in order to understand and improve safety in an organisation. These tools include safety attitude questionnaires (cdc.gov, 2022), safety climate scale, patient safety culture, among others. All these tools have their strength and weaknesses.

Communication is a key construct in the achievement of a positive safety culture. An effective communication of shared beliefs enhances understanding and adoption of positive outcomes. The types of communication could be face-to-face or written across all media. All in all, the communication process needs to be two-way, with the feedback received as appropriate. Safety audits are equally desirable in order to inform and understand the status of the organisational culture. The Safety Culture Theory recognises that safety culture is not static but rather requires continuous improvement and monitoring. Behaviour change communication can amplify the importance of ongoing education, awareness, and evaluation of road safety practices.

By encouraging individuals and organisations to constantly strive for better safety outcomes, behaviour change communication can be embraced as part of improving behaviours. One of the key activities in acquiring a safety culture is to develop the required knowledge base for reference within the individual or organisational environment. Accidents happen and there is need to address them before hand by putting in place sound safety measures, evidently an environment with a poor safety culture has many incidences of non-compliance.

One of the criticisms of this theory is that individuals can change culture depending on their surroundings, and similarly, culture is said to be about a group, not an individual. Hudson (2000) postulates that many studies on safety culture forget to measure behaviour. Equally important, he adds that at times, it is difficult to operationalise the concept of safety culture theory because culture has a wide scope. Safety culture theory is relevant to the interpersonal level of interaction of road users and can be applied to the behaviour of *Boda-boda* motorcyclists.

Safety Culture Theory emphasises the importance of attitude, norms and behaviour and can therefore be applied to interventions within the *Boda-boda* community to promote safety. It suggests that a strong safety culture can significantly reduce accidents and enhance overall safety by fostering a collective commitment to safety practices. Implementing comprehensive training programs that emphasise the importance of a safety culture can help motorcyclists develop better riding skills and adopt safer practices. Engaging the motorcycling community in safety initiatives can foster a sense of responsibility and collective effort towards reducing accidents. This can include awareness campaigns, safety workshops, and community-led safety checks. The choice of communication platforms in the dissemination of safety information will determine message reception and response. These responses can be improved by understanding the psychosocial patterns of the *Boda-boda* motorcyclists in Kenya. The National Transport and Safety Authority (NTSA), which is mandated to disseminate road safety messages, can use the Safety Culture theory in crafting messages in behaviour change communication for a road safety study focusing on the shared values, beliefs, attitudes, and behaviours related to safety within the Boda-boda motorcycling community. The *Boda-boda* Associations can equally embrace the same knowledge when communicating safety information to motorcyclists.

By integrating the principles of the Safety Culture Theory into a behaviour change communication and road safety study, researchers and practitioners can

focus on shaping values, promoting engagement, addressing organisational factors, encouraging continuous improvement, and emphasising individual and collective responsibility. This holistic approach can contribute to creating a safer road culture and reducing accidents and injuries on the road.

Behaviour Change Communication Interventions and Road Safety

Behaviour change communication is a sub-area of development communication and has been used widely to make interventions in various challenges facing society, including road safety. According to Nguzo (2017), Behaviour Change Communication (BCC) is used to improve and sustain new positive behaviour. De Mooiji (2014) amplifies this by positing that BCC promotes positive behaviours amongst individuals and communities through strategic communication interventions. These interventions have been used across all sectors of society.

Fosdick (2019) studied the effectiveness of UK road safety behaviour change interventions through an online survey and focus group discussions. The study's target population was road users, designers, implementers, and academia. The study focused on educational behaviour change interventions. There were several findings in this study, amongst such findings, it was highlighted that some interventions lacked a theoretical base at the design stage, given that several interventions were internally evaluated, while the majority were not subjected to external evaluation by practitioners. There was a need to adapt behaviour change models in the design of road safety interventions. There was also a need for an evidence-based approach and evaluation of interventions before implementation. It was recommended that academicians and practitioners work together to tailor effective interventions for road safety (Fosdick, 2019). The choice of designers for Fosdick was instructive to the current study in terms of how communication is designed to target certain sensory impulses that influence behaviour. It provided the study with capital in terms of analysing not just the influence of various media but also whether their design is effective for behaviour change.

In South East Iran, Setoodehzadeh et al. (2021), studied self-reported motorcycle riding behaviour. The issue of riders evidently flouting rules despite having knowledge of them was an area of concern. The researcher concluded that in spite of the riding behaviour being desirable, there was a great need to conduct training intervention on certification and the use of safety equipment.

Babafemi et al. (2019) studied motorcyclists' behaviour in the area of passenger safety. This study examined the use of safety helmets in an effort to establish helmet wearing and compliance with safety regulations. It was concluded that the majority of motorcyclists did not comply with traffic rules, and there was a need for education and training, more so in traffic regulation compliance. WHO (2017) postulated that behaviour change interventions have promising results in addressing risky road behaviours, and eventually this leads to reduced death and injury. Esse (2021) postulates that for positive results, it is important to combine several modes of intervention, for instance, training, education, interpersonal communication, awareness and media campaigns towards various road users. Foroutan et al. (2019) state that even short periods of BCC interventions impact motorcyclists' behaviour positively.

METHODOLOGY

This study adopted the mixed method research design, whereby both qualitative and quantitative data were collected for purposes of answering the research questions (Cresswell & Cresswell, 2018). This design allowed an interrogation into the lived experiences and contextual factors involved, hence giving the study a wide scope (Poth, 2020). This design was in line with the pragmatic philosophy which embraces multiple view of realities.

In a mixed-methods design, four common approaches are used: explanatory sequential, embedded design, convergent parallel design, and exploratory sequential design. These approaches are informed by the timings of the collection of data and the mixing of results. This study adopted the convergent parallel design, which involves conducting qualitative and quantitative components concurrently and bringing the findings together during the analysis stage (Tashakkori & Teddlie, 1998). This design was desirable because it embraces the strength of each method and controls the weakness of the other, hence enriching the

research results. This gives a balanced perspective. In this design, through the convergence of methods, the findings are cross-validated and complemented. Parallel collection of data enables the researcher to collect quantitative and qualitative data simultaneously.

This design allowed researchers to compare and contrast data from different sources, hence giving in-depth insights from the direct perspectives of the respondents (Clark & Ivankova, 2016). Hence increases the validity and credibility of the research (Bans-Akutey &Timuub 2021). The convergent parallel design offered a powerful and insightful approach to understand the complexities of road safety behaviours.

The study was conducted in four cities of Kenya which are Nairobi, Kisumu, Mombasa and Nakuru. Each of these cities has very busy road network, a high population of over one million and a high number of *Boda-boda* motorcyclists as compared to other towns and urban centres across the country, and have recorded the highest number of road accidents, injuries and death amongst road users (National Transport and Safety Authority, 2023).

The study population consisted of *Boda-boda* motorcyclists who carry pillion passengers for commercial purposes in four selected cities: Nairobi, Nakuru, Kisumu, and Mombasa. In Nairobi City, there are 121,078 registered *Boda-boda* motorcyclists, while Nakuru City has 64,866. Kisumu City is home to 46,524 motorcyclists, and Mombasa City has 48,365. This brings the total population of *Boda-boda* motorcyclists, encompassing both male and female riders, in these four cities to 280,833. The research specifically targets *Boda-boda* motorcyclists operating in these urban areas, which aligns with the main focus of the study.

Sampling Techniques

Sample size

The sample size was determined according to the formula by Taro Yamane (1967), which has a 95 per cent confidence level. The element of representativeness is quite critical in the determination of sample size. Divisions into subgroups were key. The formula is represented and worked out as follows:

$$n = \frac{N}{1 + Ne^2}$$

Where: n= Sample size required
N= Number of people in the population
e= Desired Margin of error

$$n = \frac{N}{1 + Ne^2} = \frac{280{,}833}{1 + 280{,}833(0.05)^2} = \mathbf{399}\ riders$$

Sampling Frame

This study used both probability and non-probability sampling. The four cities were purposively sampled because they have the highest number of *Boda-boda* motorcyclists, a very high population, more accidents are recorded therein (NTSA 2023), and the road networks are busier than those in the rural areas. The cities were then divided into strata according to the number of sub-counties. Hence, proportional stratified sampling was used. In this technique, the size of the sample in each stratum (sub-county) is proportional to the size of the stratum in the overall population. In addition, stratified sampling allows for the generalisation of results, increases accuracy, and reduces bias (Taherdoost, 2016). The simple random method was used to select 399 *Boda-boda* motorcyclists in the stratified sub-counties in order to answer the research questions.

The study sampled 399 *Boda-boda* motorcyclists from the four cities. This was achieved by proportionately allocating each of the sub-counties a sample based on the population of *Boda-boda* motorcyclists in that particular locality (proportionate sampling). The sample proportion relative to the population was calculated as follows:

$$Sample\ proportion\ (p) = \frac{Sample\ Size}{Population} = \frac{399}{280833} = 0.00142$$

This is shown in the following table.

Table 1. Sampling Frame

CITY	TOTAL MOTORCYCLISTS	SAMPLE PROPORTION	SAMPLE
NAIROBI	121,048	0.001422306	172
NAKURU	64,866	0.001422306	92
KISUMU	46,254	0.001422306	66
MOMBASA	48,365	0.001422306	69
TOTAL	280,833	0.001422306	**399**

Source: Author 2024

In addition, twelve key informants were purposively picked based on their expert knowledge in the area of BCC and road safety. The key informants were selected as a set of three respondents from each city drawn from the NTSA communication office, senior traffic police officers and officials from the *Boda-boda* motorcyclists association. The total number of respondents was 411.

Data Collection Methods

In the study, quantitative data were collected through semi-structured questionnaires developed by the researcher, which were administered face-to-face to the *Boda-boda* motorcyclists. The questionnaire captured the demographic information and also sought responses on the items posed in line with the research questions. The study targeted 399 *Boda-boda* motorcyclists; however, due to certain constraints, feedback was collected from 387 respondents. Research assistants were engaged and trained to administer the questionnaires amongst the respondents in the four cities of Kenya concurrently, according to the guidelines in a mixed-method study with a parallel convergent method. In-depth interview schedules were used to collect the qualitative data from the twelve key informants purposively sampled in the study. A total of nine responses were received from the four cities.

Data Analysis and Presentation

The mixed method approach was used whereby qualitative and quantitative data were analysed and presented for interpretation. The two strands aided in collecting data that was complimentary.

Qualitative Data

Data collected from the key informants was transcribed into similar themes for analysis. Data were transcribed before coding; irrelevant data were discarded and then the remaining data were organised into themes. This made the data comprehensible. The choice of thematic analysis was informed by the ability to categorise and analyse the data (Ndungu, 2022). The final step was interpretation and presentation of findings in line with the research questions.

Quantitative Data

Descriptive and inferential statistical techniques were used to analyse the quantitative data. The descriptive statistics included the use of frequencies, percentages and standard deviations. On the other hand, inferential statistics was handled through the use of a regression model in order to explore relationships or differences between variables (Anderson, 2011). A multivariate regression model was applied to determine the relative importance of each of the four variables in road safety practices, while a statistical software for social science (SPSS Version 26) was used for data analysis.

This being a convergent parallel approach, qualitative and quantitative were analysed separately, but will converge at the interpretation stage. Tables, charts and graphs, and statistical measures were used to present the findings then integrate them.

The multiple regression model is shown below:

$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$

Where:

Y = Dependent variable (road safety)

α = Constant

X_1, X_2, X_3, X_4 = Explanatory variables which include media campaign, participatory communication, traffic visual communication, and information, education and communication respectively

$\beta_1, \beta_2, \beta_3, \beta_4$ = Regression coefficient for media campaign, participatory communication, traffic visual

communication, and information, education and communication, respectively
e = Error term

Diagnostic Tests
The researcher carried out diagnostic tests to ensure compliance with the classical linear regression model (CLRM). This was done prior to conducting the regression analysis. The diagnostic tests in this study include autocorrelation homoscedasticity, linearity and multi-collinearity and normality.

FINDINGS AND DISCUSSION
Descriptive Findings for Attitude
In section 4.10.1, the study explores descriptive findings pertaining to attitudes among *Boda-boda* motorcyclists regarding road safety. Through an extensive analysis of responses, the research aims to provide insights into the cognitive, affective, and behavioural dimensions of attitude among this demographic. These dimensions are crucial as they shape the perceptions, beliefs, and actions of motorcyclists on the road, influencing their adherence to safety protocols and regulations.

The findings are presented in Table 4.23, which outlines the level of agreement among respondents regarding various aspects defining their attitude towards road safety. Each statement is evaluated based on the distribution of responses, mean scores, standard deviation, skewness, and kurtosis, offering a comprehensive overview of the prevailing attitudes within the *Boda-boda* rider community. By examining these descriptive findings, the study identified patterns, trends, and areas of concern related to attitudes towards road safety among *Boda-boda* motorcyclists.

Table 2: Level of Agreement on Aspects Describing Attitude

Statement	Distribution of Responses (%)					Mean	Std. Deviation	Skewness	Kurtosis
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Statistic	Statistic	Statistic	Statistic
Cognitive Attitude:									
a) I am well-informed about road safety rules and regulations.	1.6	4.7	11.4	35.1	47.3	4.220	0.931	-1.264	1.351
b) Understanding and following road safety practices are crucial for *Boda-boda* motorcyclists.	1.6	0.8	9.3	32.8	55.6	4.401	0.813	-1.641	3.441
c) Road safety is considered a crucial aspect of responsible riding.	1.3	0.3	10.6	31.8	56.1	4.411	0.791	-1.533	3.035
Aggregate	***1.5***	***1.9***	***10.4***	***33.2***	***53.0***	***4.344***	***0.845***	***-1.479***	***2.609***
Affective Attitude:									
a) Concern for the safety of myself and others is paramount when riding on the road.	1.3	1.0	5.9	32.6	59.2	4.473	0.766	-1.873	4.690
b) I feel a sense of responsibility to contribute to road safety within the *Boda-boda* rider community.	1.3	0.5	6.5	38.5	53.2	4.419	0.748	-1.677	4.364
c) Road safety campaigns evoke emotions of concern and awareness about safe riding.	2.1	1.6	19.4	34.1	42.9	4.142	0.923	-1.040	1.042
Aggregate	***1.6***	***1.0***	***10.6***	***35.1***	***51.8***	***4.345***	***0.813***	***-1.530***	***3.365***

Statement	Distribution of Responses (%)					Mean	Std. Deviation	Skewness	Kurtosis
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Statistic	Statistic	Statistic	Statistic
Behavioural Attitude:									
a) I consistently adhere to road safety rules and regulations while riding my *Boda-boda* motorcycle.	1.6	4.1	13.2	38.0	43.2	4.171	0.917	-1.154	1.201
b) Actively practising defensive riding techniques is essential to prevent accidents and ensure road safety.	1.8	2.1	12.7	45.2	38.2	4.160	0.855	-1.214	2.076
c) I believe in setting a positive example for other *Boda-boda* motorcyclists by following road safety guidelines.	1.6	1.6	9.6	42.1	45.2	4.279	0.821	-1.405	2.799
Aggregate	***1.6***	***2.6***	***11.8***	***41.8***	***42.2***	***4.203***	***0.864***	***-1.258***	***2.025***

Source: Author 2024

Table 2 provides a comprehensive overview of the descriptive findings concerning the attitude of *Boda-boda* motorcyclists towards road safety, broken down into cognitive, affective, and behavioural components.

In terms of cognitive attitude, respondents demonstrated a commendable level of awareness and comprehension regarding road safety regulations. The mean scores reveal that the majority of respondents strongly agreed or agreed with statements such as "I am well-informed about road safety rules and regulations" (M = 4.220, SD = 0.931) and "Understanding and following road safety practices are crucial for *Boda-boda* motorcyclists" (M = 4.401, SD = 0.813). These high mean scores underscore a robust cognitive attitude among *Boda-boda* motorcyclists, suggesting that they possess a sound understanding of the importance of adhering to road safety measures.

When considering affective attitude, respondents displayed a notable degree of concern and commitment towards road safety. The mean scores indicate a strong agreement with statements like "Concern for the safety of myself and others is paramount when riding on the road" (M = 4.473, SD = 0.766) and "I feel a sense of responsibility to contribute to road safety within the *Boda-boda* rider community" (M = 4.419, SD = 0.748). These elevated mean scores reflect a positive affective attitude characterised by a genuine concern for personal safety and a proactive approach to fostering road safety within the *Boda-boda* community.

Regarding behavioural attitude, respondents exhibited a propensity to actively engage in safe riding practices and adhere to road safety guidelines. The mean scores indicate a strong inclination towards statements such as "I consistently adhere to road safety rules and regulations while riding my *Boda-boda* motorcycle" (M = 4.171, SD = 0.917) and "Actively practising defensive riding techniques is essential to prevent accidents and ensure road safety (Mean = 4.160). These findings suggest a positive behavioural attitude characterised by a commitment to adopting safe riding behaviours and setting a positive example for fellow motorcyclists.

The comments provided by respondents underscored the critical importance of effectively managing attitudes towards road safety among *Boda-boda* motorcyclists. Across a wide spectrum of responses,

several key themes emerged, shedding light on the complexities and nuances of this issue.

Firstly, there was a resounding call for motorcyclists to take road safety seriously and adhere rigorously to traffic rules and regulations. This sentiment reflected a recognition of the inherent risks associated with riding, particularly in densely populated urban areas where *Boda-boda* operations were prevalent. Respondents emphasised the need for motorcyclists to maintain a clear state of mind while on the road, avoiding reckless behaviours such as over speeding and overtaking, which could endanger not only their own lives but also those of passengers and other road users.

Moreover, there was a strong consensus among respondents regarding the importance of increasing public awareness and education on road safety. Many suggested that workshops, campaigns, and training sessions should be organised to educate both motorcyclists and the general public about road safety practices and regulations. This proactive approach aimed to empower motorcyclists with the knowledge and skills necessary to navigate traffic safely while also fostering a culture of mutual respect and cooperation among all road users.

Another prevalent theme was the emphasis on personal responsibility and self-control in managing attitudes towards road safety. Respondents stressed the need for motorcyclists to exercise restraint, control their temper, and adhere diligently to road safety guidelines. They emphasised the importance of recognising the impact of one's actions on oneself and others, highlighting the role of individual agency in promoting safer riding behaviours.

Additionally, there was a call for strict enforcement of road safety regulations and effective punishment for wrongdoers. Respondents argued that imposing fines and penalties on those who violated traffic rules could serve as a deterrent and promote compliance. They also advocated for holding those responsible for enforcing road safety measures accountable, thereby ensuring accountability and transparency in the implementation of road safety policies.

Furthermore, respondents cited personal experiences, such as witnessing accidents or being involved in them, as powerful catalysts for changing attitudes towards road safety. They suggested that raising awareness about the consequences of road accidents could help instil a sense of responsibility and empathy among motorcyclists, motivating them to prioritise safety and adopt defensive riding techniques.

Thus, the comments highlighted the multifaceted nature of managing attitudes towards road safety among Boda-boda motorcyclists. They underscored the importance of education, awareness, personal responsibility, and community engagement in fostering safer riding behaviours and reducing the incidence of road accidents. By addressing these key factors comprehensively, stakeholders could work towards creating a safer and more conducive environment for *Boda-boda* operations, ultimately contributing to the overall improvement of road safety standards.

Overall, the descriptive statistics reveal a positive attitude towards road safety among *Boda-boda* motorcyclists, encompassing strong cognitive understanding, genuine affective concern, and proactive behavioural engagement in safe riding practices.

Inferential Findings for Behaviour Change Communication Interventions, Attitude and Road Safety amongst *Boda-boda* Motorcyclists

Inferential findings for Behaviour Change Communication (BCC) interventions, attitude, and road safety among *Boda-boda* motorcyclists are presented in Table 4.24, Table 4.25, and Table 4.26. These findings explore the relationships between BCC interventions, attitude, and road safety outcomes, shedding light on the effectiveness of interventions aimed at improving road safety behaviours among this demographic.

Table 3: R^2 Change for Behaviour Change Communication Interventions, Attitude and Road Safety amongst *Boda-boda* Motorcyclists

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.895a	0.801	0.800	0.347	0.801	1547.946	1	385	0.000
2	.895b	0.801	0.800	0.348	0.000	0.075	1	384	0.784
3	.898c	0.807	0.805	0.343	0.006	11.705	1	383	0.001
a Predictors: (Constant), Behaviour Change Communication Interventions									
b Predictors: (Constant), Behaviour Change Communication Interventions, Attitude									
c Predictors: (Constant), Behaviour Change Communication Interventions, Attitude, Interaction Term									

Source: Author 2024

Table 3 presents the R^2 change for Behaviour Change Communication (BCC) interventions, attitude, and road safety among *Boda-boda* motorcyclists. The R2 change indicates how much of the variance in road safety can be explained by adding BCC interventions and attitude variables to the model. In Model 1, which includes only BCC interventions as predictors, the R2 value is 0.801, indicating that BCC interventions explain approximately 80.1 per cent of the variance in road safety among *Boda-boda* motorcyclists. The F change statistic is significant ($p < 0.001$), suggesting that the addition of BCC interventions significantly improves the model's predictive power compared to a constant-only model.

Model 2 introduces attitude as an additional predictor alongside BCC interventions. The R2 value remains unchanged at 0.801, indicating that attitude does not contribute significantly to explaining additional variance in road safety beyond that explained by BCC interventions alone. The F change statistic is not significant ($p = 0.784$), suggesting that the addition of attitude does not significantly improve the model's predictive power compared to Model 1.

Model 3 adds an interaction term between BCC interventions and attitude. The R2 value increases slightly to 0.807, suggesting that the interaction between BCC interventions and attitude accounts for a small additional amount of variance in road safety. The F change statistic is significant ($p = 0.001$), indicating that the interaction between BCC interventions and attitude significantly improves the model's predictive power compared to Model 2.

These findings suggest that while BCC interventions play a significant role in predicting road safety among *Boda-boda* motorcyclists, the inclusion of attitude variables alone does not significantly enhance the predictive power of the model. However, the interaction between BCC interventions and attitude does have a modest but significant impact on predicting road safety, indicating a potential synergistic effect between these factors.

Table 4: ANOVA for Behaviour Change Communication Interventions, Attitude and Road Safety amongst *Boda-boda* Motorcyclists

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	186.752	1	186.752	1547.95	.000b
	Residual	46.448	385	0.121		
	Total	233.2	386			
2	Regression	186.761	2	93.38	772.152	.000c
	Residual	46.439	384	0.121		
	Total	233.2	386			

3	Regression	188.138	3	62.713	533.021	.000d
	Residual	45.062	383	0.118		
	Total	233.2	386			
a Dependent Variable: Road Safety						
b Predictors: (Constant), Behaviour Change Communication Interventions						
c Predictors: (Constant), Behaviour Change Communication Interventions, Attitude						
d Predictors: (Constant), Behaviour Change Communication Interventions, Attitude, Interaction Term						

Source: Author 2024

Table 4 presents the results of the Analysis of Variance (ANOVA) for Behaviour Change Communication (BCC) interventions, attitude, and road safety among *Boda-boda* motorcyclists. ANOVA is used to assess the statistical significance of the relationship between the predictor variables (BCC interventions and attitude) and the outcome variable (road safety). In Model 1, which includes only BCC interventions as predictors, the ANOVA results indicate a significant relationship between BCC interventions and road safety ($F = 1547.95$, $p < 0.001$). This suggests that BCC interventions have a significant impact on road safety among *Boda-boda* motorcyclists.

Model 2 introduces attitude as an additional predictor alongside BCC interventions. The ANOVA results for Model 2 show a significant relationship between the combined predictors (BCC interventions and attitude) and road safety ($F = 772.152$, $p < 0.001$). This indicates that the combination of BCC interventions and attitude variables significantly influences road safety among *Boda-boda* motorcyclists.

In Model 3, an interaction term between BCC interventions and attitude is added. The ANOVA results for Model 3 reveal a significant relationship between the combined predictors (BCC interventions, attitude, and interaction term) and road safety ($F = 533.021$, $p < 0.001$). This suggests that the interaction between BCC interventions and attitude, in addition to the main effects of these variables, significantly affects road safety among *Boda-boda* motorcyclists.

The ANOVA findings highlight the importance of both BCC interventions and attitude in predicting road safety among *Boda-boda* motorcyclists. Additionally, the inclusion of an interaction term further enhances the predictive power of the model, indicating a complex relationship between BCC interventions, attitude, and road safety.

Table 5: Model Coefficients for Behaviour Change Communication Interventions, Attitude and Road Safety amongst *Boda-boda* Motorcyclists

Model		Unstandardised Coefficients		Standardised Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-0.230	0.105		-2.194	0.029
	Behaviour Change Communication Interventions	1.068	0.027	0.895	39.344	0.000
2	(Constant)	-0.250	0.129		-1.944	0.053
	Behaviour Change Communication Interventions	1.064	0.031	0.891	34.332	0.000
	Attitude	0.008	0.031	0.007	0.275	0.784
3	(Constant)	0.190	0.181		1.049	0.295
	Behaviour Change Communication Interventions	0.794	0.085	0.665	9.382	0.000

	Attitude	0.005	0.030	0.004	-0.011	0.991
	Interaction Term	0.040	0.012	0.242	3.421	0.001
a Dependent Variable: Road Safety						

Source: Author 2024

Table 5 displays the model coefficients for Behaviour Change Communication (BCC) interventions, attitude, and road safety among *Boda-boda* motorcyclists. These coefficients represent the relationships between the predictor variables (BCC interventions and attitude) and the outcome variable (road safety), accounting for the influence of other variables in the model.

In Model 1, where only BCC interventions are included as predictors, the coefficient for BCC interventions is 1.068 ($p < 0.001$). This indicates that for every one-unit increase in BCC interventions, there is an associated increase of 1.068 units in road safety, holding other variables constant.

Model 2 introduces attitude as an additional predictor alongside BCC interventions. In this model, the coefficient for BCC interventions remains significant at 1.064 ($p < 0.001$), suggesting that BCC interventions continue to have a positive impact on road safety. However, the coefficient for attitude is not statistically significant ($p = 0.784$), indicating that attitude alone does not significantly influence road safety when considered alongside BCC interventions.

In Model 3, which includes an interaction term between BCC interventions and attitude, the coefficient for BCC interventions remains significant at 0.794 ($p < 0.001$). The coefficient for attitude remains non-significant ($p = 0.991$), indicating that attitude does not have a direct effect on road safety in this model. However, the interaction term between BCC interventions and attitude has a significant coefficient of 0.040 ($p = 0.001$), suggesting that the combined effect of BCC interventions and attitude on road safety depends on the interaction between these variables.

Overall, the model coefficients highlight the importance of BCC interventions in influencing road safety among *Boda-boda* motorcyclists. While attitude alone does not directly impact road safety, there appears to be an interaction between BCC interventions and attitude that influences road safety outcomes. This underscores the complexity of the relationship between these variables and emphasises the need for comprehensive approaches to promoting road safety among *Boda-boda* motorcyclists.

Qualitative Findings for Behaviour Change Communication (BCC) Interventions, Attitude, and Road Safety

Regarding interview findings on behaviour change communication (BCC) interventions, attitude, and road safety among *Boda-boda* motorcyclists in Kenyan cities, several key themes emerge, shedding light on the complex interplay between communication strategies, individual attitudes, and road user behaviour. Respondents expressed varied perceptions regarding the effectiveness of BCC interventions in promoting road safety among *Boda-boda* motorcyclists. While some viewed these interventions as valuable tools for raising awareness, instilling knowledge, and shaping attitudes towards safe road behaviours, others questioned their efficacy in achieving tangible behaviour change outcomes. Factors influencing perceived impact included the clarity, relevance, and accessibility of BCC messages, as well as the credibility and trustworthiness of the sources delivering them.

Attitudes emerged as a central determinant of road safety behaviour among *Boda-boda* motorcyclists. Respondents emphasised the importance of understanding motorcyclists' attitudes towards risk, safety, and compliance with traffic regulations in shaping their on-road conduct. Positive attitudes towards road safety were associated with greater adherence to safe riding practices, while negative attitudes or misconceptions could undermine efforts to promote safer behaviours. Moreover, respondents highlighted the influence of social norms, peer pressure, and cultural factors in shaping motorcyclists' attitudes towards road safety. One of the respondents stated that;

> *"…. the bad attitude and behaviour on the roads are a culture embraced over the years. The Boda-bodas were introduced in Kenya in 2004 by President Mwai Kibaki to create employment for about 500,000 youths. The preparations for these zero-rated Bodas weren't adequate. The above is so because the NTSA as a regulator came into place in the year 2011 and the motorcycle laws were put in place in 2015 hence streamlining the sector has been an ongoing process…"*

Another respondent observed that;

> *"…. there is rivalry between the road users who include motorists, motorcyclists, bikers and pedestrians, hence programmes for 'brother's keeper' are needed for road harmony. The riders are also in competition with each other for the customers. Instilling a sense of responsibility and decorum on the road will be able to address the issues of attitude and behaviour amongst Boda-boda riders."*

Respondents identified several challenges and barriers to attitude change among Boda-boda motorcyclists. These included entrenched cultural norms and beliefs, economic pressures, limited access to training and education, and resistance to external interventions perceived as paternalistic or coercive.

Concerning the motorcyclists' behaviour on the road, a respondent had this to say;

> *"…. These Boda-boda riders are always in a hurry and competing with one another; they have pressure to make more money to pay their bills because of the many responsibilities. Others have a careless attitude because they think they have someone who can get them out if they get into trouble with the police. They need communication interventions that will address and improve their attitude and behaviour on road safety."*

Moreover, respondents noted the complexity of addressing underlying attitudes and beliefs that may contribute to risky road behaviours, highlighting the need for targeted, culturally sensitive approaches that address the root causes of unsafe riding practices. A recurring theme in the qualitative data were the importance of providing ongoing reinforcement and support to *Boda-boda* motorcyclists to sustain positive behaviour change.

A respondent posited that;

> *"…. the motorcyclists just ignore the traffic rules, they jump traffic lights, carry excess pillion, some ride while drunk while others do not wear helmets. There is need for continuous road safety initiatives to uphold positive behaviour amongst the riders."*

Respondents emphasised the value of practical training, peer mentoring, and community-based initiatives that offer motorcyclists opportunities to practice and internalise safe riding habits in real-world settings. Moreover, they highlighted the role of social support networks, including family, friends, and fellow motorcyclists, in reinforcing road safety messages and norms within the *Boda-boda* community.

Respondents underscored the need for BCC interventions to incorporate targeted strategies for attitude change alongside knowledge dissemination and skill-building activities. These strategies included persuasive communication techniques, social marketing campaigns, and cognitive-behavioural approaches that challenge existing beliefs, attitudes, and perceptions related to road safety. Moreover, respondents advocated for the use of positive reinforcement, role modelling, and peer influence strategies to promote pro-social attitudes and norms among *Boda-boda* motorcyclists.

Respondents highlighted the importance of robust evaluation and monitoring mechanisms to assess the effectiveness and impact of BCC interventions on road safety outcomes.

An interviewee stated that;

> *"The element of evaluation of programs and campaigns is missing hence feedback is sometimes picked from WhatsApp messages amongst the riders' leadership groups. However, a system called BIMS that had been earmarked to collect Boda-boda riders' data did not work, plans are underway to pilot the system again in order to collect relevant data from the riders. This data among other things will aid in the development and evaluation of road safety interventions."*

They emphasised the need for comprehensive data collection, including pre- and post-intervention surveys, observational studies, and behavioural assessments, to track changes in attitudes, knowledge, and behaviour among *Boda-boda* motorcyclists over time. Moreover, respondents stressed the value of participatory evaluation approaches that engage stakeholders and community members in the assessment process, ensuring that interventions are responsive to local needs and contexts.

The qualitative data revealed a sense of optimism regarding the potential for innovation and collaboration in designing and implementing BCC interventions for road safety among *Boda-boda* motorcyclists. Respondents highlighted the opportunities presented by emerging technologies, social media platforms, and community-based approaches to reach and engage motorcyclists more effectively. Moreover, they emphasised the importance of partnership and collaboration between government agencies, NGOs, academia, and the private sector in mobilising resources, sharing expertise, and scaling up successful BCC initiatives.

Respondents offered several policy recommendations to enhance the effectiveness of BCC interventions for road safety among *Boda-boda* motorcyclists. These included strengthening regulatory frameworks, increasing investment in road safety education and training programs, and promoting multi-sectoral collaboration and coordination. Moreover, respondents emphasised the need for sustained political commitment, community engagement, and grassroots empowerment efforts to address the underlying determinants of road traffic injuries and fatalities among *Boda-boda* motorcyclists in Kenyan cities.

Therefore, the findings highlight the importance of addressing individual attitudes and beliefs as key determinants of road user behaviour. By integrating targeted attitude change strategies into BCC initiatives, fostering social support networks, and leveraging collaborative partnerships, stakeholders can work together to promote safer riding practices, reduce road traffic injuries, and enhance the overall safety of Kenyan cities.

CONCLUSION AND RECOMMENDATIONS

Conclusion: The analysis reveals several key findings. First, the regression analysis indicates a significant relationship between BCC interventions and road safety outcomes among *Boda-boda* motorcyclists. The inclusion of attitude as a moderating variable further elucidates the nuanced nature of this relationship, highlighting the role of motorcyclists' perceptions, beliefs, and attitudes in shaping their responses to safety interventions. Furthermore, the findings underscore the importance of considering the interaction effects between BCC interventions and attitude in predicting road safety behaviours. The presence of a significant interaction term suggests that the impact of BCC initiatives on motorcyclists' safety practices is contingent upon their underlying attitudes towards road safety. This highlights the need for tailored interventions that not only address behavioural barriers but also target attitudinal factors influencing motorcyclists' risk perception and decision-making processes. Moreover, the study identifies potential areas for intervention and improvement based on the observed coefficients and standardised beta values. By analysing the magnitude and direction of these coefficients, researchers can pinpoint the most influential predictors of road safety outcomes and prioritise areas for intervention focus. For example, the significant contribution of BCC interventions to variance in road safety suggests the efficacy of targeted communication strategies in promoting safer riding behaviours among *Boda-boda* operators. Additionally, the findings underscore the need for a multi-dimensional approach to road safety interventions that incorporates both attitudinal and behavioural components. By recognising the interplay between cognitive, affective, and behavioural factors, stakeholders can develop more holistic and effective strategies for promoting road safety among *Boda-boda* motorcyclists. This may involve leveraging existing attitudes and beliefs as leverage points for behaviour change, as well as addressing underlying cognitive biases and socio-cultural norms that may influence motorcyclists' risk perception and decision-making processes. Finally, concerning behaviour change communication (BCC) interventions, the research highlights the complexity of influencing *Boda-*

boda motorcyclists' attitudes and behaviours towards road safety. Successful BCC initiatives require vigorous, multifaceted strategies that target individual, interpersonal, and environmental factors shaping motorcyclists' road behaviours. By combining media campaigns, participatory approaches like peer-led safety workshops, focus group discussions, visual communication strategies including installing road safety billboards specifically for motorcyclists, and IEC interventions, which include road safety manuals, road safety apps, among others. BCC efforts can create synergies, amplify impact, and drive sustainable change in Boda-boda motorcyclists' road safety practices. The lack of addressing the communication gaps gives room to further misalignment, which can result in more road fatalities.

Recommendations: To foster positive attitudes towards road safety among *Boda-boda* motorcyclists, it is necessary to implement targeted awareness campaigns and educational initiatives that address underlying beliefs, perceptions, and social norms related to risk-taking behaviours and safety practices. Employing persuasive messaging techniques that appeal to motorcyclists' sense of responsibility, community, and self-efficacy can help shift attitudes towards safer riding practices. Moreover, integrating attitude-focused components into behaviour change communication interventions, such as role modelling, testimonials, and peer-to-peer advocacy, can reinforce positive behavioural norms and values within *Boda-boda* communities. Continuous monitoring and evaluation of attitude change initiatives, which include observational studies, social media monitoring, community forums, and training, amongst others, are essential for assessing their effectiveness and guiding iterative improvements. To enhance managerial practices related to behaviour change communication (BCC) interventions, it is recommended that a holistic and integrated approach be adopted that addresses individual, interpersonal, and community factors influencing road safety behaviours among *Boda-boda* motorcyclists. This may involve combining media campaigns with community-based outreach, training programs, and policy interventions to create a supportive ecosystem for behaviour change. Engaging key stakeholders, including government agencies, NGOs, transport unions, and academic institutions, in collaborative BCC efforts can enhance coordination, resource mobilisation, and sustainability. Additionally, investing in robust monitoring and evaluation mechanisms can enable ongoing assessment of BCC interventions' effectiveness and impact on road safety outcomes.

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