LASUJMS
JOURNAL OF MANAGEMENT SCIENCES

VOLUME 9, ISSUE 2 - 2026
https://doi.org/10.5281/zenodo.21008214

PERCEIVED FACTORS INFLUENCING PEDESTRIAN ACCIDENTS ALONG MAJOR TRAFFIC CORRIDORS IN CALABAR METROPOLIS

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Abstract
Pedestrians constitute one of the most vulnerable categories of road users, particularly in developing countries where rapid urbanisation, population growth, and inadequate transport infrastructure contribute significantly to road traffic accidents. This study assessed the perceived factors influencing pedestrian accidents along major traffic corridors in Calabar. The study focused on four major corridors: Murtala Mohammed Highway, Marian Road, Etta Agbor Road, and Calabar Road. A survey research design was adopted, and primary data were collected through structured questionnaires administered to pedestrians within the study area. A total of 876 questionnaires were distributed, of which 787 were successfully retrieved and analysed. Descriptive statistics and factor analysis were employed to identify and classify the major determinants of pedestrian accidents. The findings revealed twenty-nine (29) variables, which were grouped into five major clusters influencing pedestrian accidents: human error, environmental factors, awareness factors, safety/enforcement factors, and vehicle/mechanical condition factors. The study concluded that pedestrian accidents in Calabar Metropolis are influenced by a combination of behavioural, environmental, infrastructural, enforcement, and mechanical factors. The study therefore recommends stricter enforcement of traffic regulations, provision and maintenance of adequate pedestrian infrastructure, increased public road safety awareness campaigns, regular vehicle maintenance checks, and improved transport safety policies aimed at reducing pedestrian accidents and enhancing pedestrian safety in the study area.

Keywords: Human error, pedestrian accidents, pedestrian infrastructure, road safety, traffic corridors.

1. Introduction

Walking is one of the oldest and most common modes of transportation and plays an important role in daily mobility, providing social, health, economic, and environmental benefits (Budzynski et al., 2019; Litman, 2021). Despite these benefits, pedestrians remain among the most vulnerable road users because they are directly exposed to vehicular traffic and are at high risk of injury or death during road crashes (WHO, 2018; Umar et al., 2019). Recent reports show that pedestrian safety continues to be a major global concern, especially in urban areas where inadequate infrastructure, speeding, and unsafe crossing conditions increase crash risks (WHO, 2025; Sulle et al., 2025).

In Calabar, rising traffic volumes along major corridors have increased pedestrian exposure to accidents, particularly in areas with limited sidewalks, poor road design, inadequate crossing facilities,

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https://doi.org/10.5281/zenodo.21008214

and weak traffic control measures. Although previous studies in Nigeria have examined road traffic accidents, most focus on drivers and vehicles, with limited attention to pedestrians' perceptions of accident causes, especially within Calabar Metropolis (Odufuwa et al., 2022). More recent studies also emphasise that pedestrian accident patterns are strongly linked to road environment, traffic density, and pedestrian behaviour, making local-level research increasingly necessary for effective planning interventions (Liashkov, 2026).

This gap is important because understanding pedestrians' perceptions can provide useful evidence for improving road safety policies, pedestrian infrastructure, and urban transport planning. Therefore, this study examines the perceived factors influencing pedestrian accidents along major traffic corridors in Calabar Metropolis, with the aim of contributing practical recommendations for improving pedestrian safety. Therefore, this study raised a research question: What are the perceived factors influencing pedestrian accidents along major traffic corridors in Calabar Metropolis?

2. Literature Review

Pedestrianisation refers to the planning, design, and management of streets or urban spaces primarily for pedestrian movement by reducing or restricting motor vehicle access either temporarily or permanently. It is aimed at creating safe, accessible, and walkable environments that prioritise pedestrians over vehicular traffic (Asaju, 2018; Litman, 2021). According to Hussein (2018), pedestrianisation involves closing streets fully or partially to vehicles to improve mobility, accessibility, and pedestrian safety. Globally, pedestrianisation has become a major strategy in urban transport planning across Europe, North America, Asia, and increasingly Africa due to growing concerns about traffic congestion, road crashes, and environmental quality (Budzynski et al., 2019; UN-Habitat, 2022). Recent studies show that pedestrian-friendly streets contribute significantly to reduced road crashes, improved public health outcomes, increased commercial activity, and sustainable urban development (WHO, 2023; Aderamo & Olawole, 2024). In many cities, pedestrianisation is linked with wider sidewalks, traffic calming, safer crossing points, improved lighting, and dedicated pedestrian infrastructure.

However, despite these benefits, many cities in developing countries, including Nigeria, still face inadequate pedestrian infrastructure due to poor urban planning, weak traffic regulation, and increasing motorisation (Odufuwa et al., 2022). In cities such as Calabar, pedestrian movement often competes directly with vehicular traffic along major road corridors, thereby increasing accident risks. This makes pedestrianisation highly relevant to the present study because it provides a framework for understanding how road design and infrastructure influence pedestrian safety.

Pedestrian accidents refer to crashes involving pedestrians and moving vehicles resulting in injury or death. Pedestrians are widely recognised as one of the most vulnerable road users because they lack physical protection during collisions (WHO, 2018; WHO, 2025). Globally, pedestrian injuries and

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fatalities remain a major public health and transport challenge, especially in urban areas of low- and middle-income countries.

The World Health Organisation reported that pedestrian deaths continue to account for a large share of global road traffic fatalities, with the burden highest in developing countries where infrastructure provision is weak (WHO, 2018; WHO, 2023). More recent evidence confirms that unsafe crossing locations, speeding, poor visibility, inadequate sidewalks, and increasing urban traffic remain leading contributors to pedestrian crashes worldwide (WHO, 2025; Sulle et al., 2025).

In Nigeria, pedestrian accidents remain common due to weak enforcement of traffic regulations, inadequate crossing facilities, and risky road-use behaviours among both drivers and pedestrians (Busari, 2019; Ojekunle et al., 2020). Previous studies also show that many pedestrians cross roads at undesignated points despite the availability of pedestrian bridges or zebra crossings, increasing exposure to crashes (Guo et al., 2018; Tefe et al., 2020).

Theoretical Review

This study is anchored on the Theory of Planned Behaviour (TPB) developed by Ajzen (1991). The theory explains how individual attitudes, subjective norms, and perceived behavioural control shape behavioural intentions and actual behaviour.

Applied to pedestrian safety, TPB suggests that pedestrians' decisions, such as where to cross, whether to obey traffic signals, or whether to use pedestrian facilities, are influenced by:

- Attitude – personal beliefs about safe or unsafe crossing;
- Subjective norms – social influence from family, peers, and other road users;
- Perceived behavioural control – the pedestrian's belief about how easy or difficult it is to behave safely.

Studies applying TPB to pedestrian movement have found strong relationships between behavioural intention and pedestrian crossing behaviour (Evans & Norman, 2003; Zhou et al., 2017). More recent studies also confirm that pedestrians' perceptions of risk, convenience, traffic pressure, and road design strongly influence compliance with safety rules (Nwakaire et al., 2022; Liashkov, 2026).

This theory is relevant to the present study because it helps explain how pedestrians' perceptions of road conditions and driver behaviour influence accident exposure along major traffic corridors in Calabar Metropolis.

Empirical Review

Several studies have examined the causes and patterns of pedestrian accidents across different countries. Boulaajoul (2018) found that pedestrian accidents in urban areas are influenced by pedestrian behaviour, driver behaviour, and road infrastructure quality. Budzynski et al. (2019) similarly identified poor road maintenance, road design deficiencies, speeding, and unsafe crossing practices as major determinants of pedestrian crashes.

In Ghana, Tefe et al. (2020) found that inadequate pedestrian facilities and unsafe crossing behaviour were major contributors to pedestrian injuries. Hafeez et al. (2020) also identified speed, lighting

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conditions, weather, traffic volume, and road condition as significant predictors of pedestrian accident occurrence.

In Bangladesh, Zafri et al. (2020) found that night-time travel, poor visibility, and road geometry significantly influenced pedestrian crash rates. Similarly, Macioszek et al. (2023) reported that speeding, heavy vehicles, alcohol use, weather conditions, and poor visibility were strong determinants of pedestrian fatalities.

Recent studies continue to reinforce these findings. Sulle et al. (2025) found that pedestrian fatalities are closely linked to road infrastructure quality, crossing design, traffic volume, and behavioural factors. Liashkov (2026) further observed that corridor design, pedestrian density, land-use pattern, and environmental conditions strongly shape pedestrian crash hotspots in urban areas.

In Nigeria, studies by Asaju et al. (2020), Odufuwa et al. (2022), and Aderamo and Olawole (2024) have consistently identified overspeeding, poor road design, weak enforcement, lack of sidewalks, poor street lighting, pedestrian impatience, and unsafe driver behaviour as major causes of pedestrian accidents.

Gap in Literature and Rationale for the Study

Although substantial research exists on pedestrian accidents globally and within Nigeria, the literature reveals several important gaps. First, most studies focus broadly on road traffic accidents or on driver-related causes, while fewer studies examine pedestrians' own perceptions of accident causes. Yet perception matters because it shapes behaviour and determines how pedestrians interact with transport infrastructure. Second, most Nigerian studies are concentrated in cities such as Lagos, Abuja, Ibadan, or Minna, with limited empirical attention given to Calabar. Third, previous studies often emphasise accident statistics and crash records, but fewer investigate how pedestrians themselves perceive infrastructural, behavioural, and environmental factors contributing to accidents along major urban corridors. This study addresses these gaps by focusing specifically on pedestrians' perceptions of the factors influencing pedestrian accidents along major traffic corridors in Calabar Metropolis, thereby providing local evidence useful for transport planning, pedestrian infrastructure improvement, and road safety policy.

3. Methodology

Calabar comprises Calabar Municipality and Calabar South Local Government Area (LGA). The Metropolis lies between Longitudes 8˚18'00" E to 8˚24'00" E and Latitudes 4˚54'00" N to 5˚04'00" N and is located in the southern part of Nigeria. In 1991, the population of the city was 328,878 and a projected population of 529,362 in 2015 using a growth rate of 2.54. (Okon and Njoku, 2017).

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VOLUME 9, ISSUE 2 - 2026
https://doi.org/10.5281/zenodo.21008214

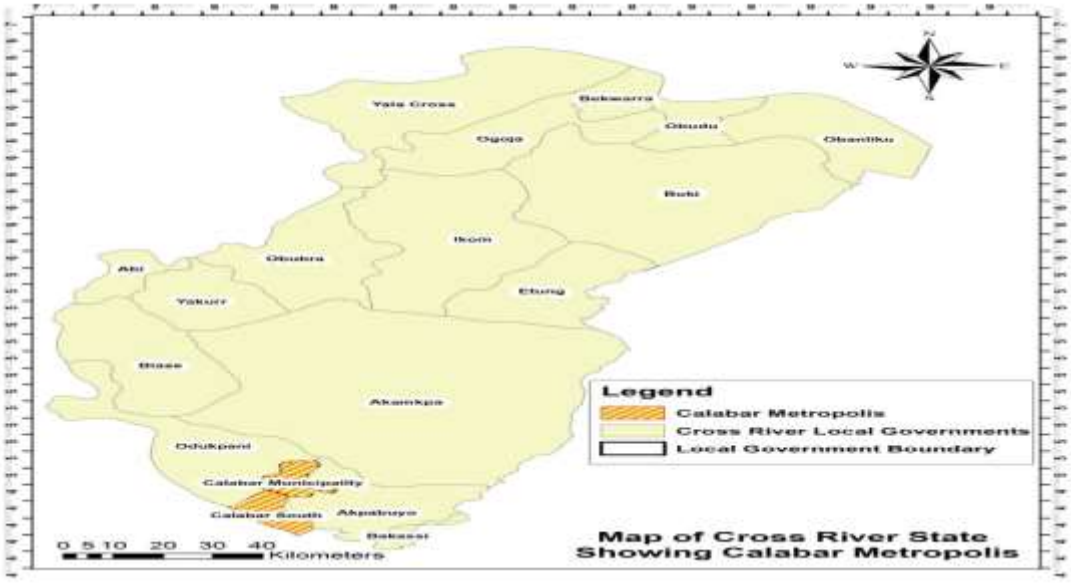

Figure 1.1 Map of Cross River State showing Calabar Metropolis
Source: Department of Geography, University of Calabar

This study was conducted in Calabar, which comprises Calabar Municipality and Calabar South Local Government Areas. Four major traffic corridors were purposively selected for the study: Etta Agbor Road, Marian Road, Murtala Muhammed Highway, and Calabar Road. The study adopted a survey research design, using primary data collected through a structured questionnaire administered to pedestrians along the selected corridors. A convenient sampling technique was adopted. Pedestrian traffic counts were also conducted to determine the daily and hourly movement of pedestrians within the study area. Based on the traffic count, the sample size was determined using the Taro Yamane formula. A total of 876 questionnaires were distributed, out of which 787 were successfully retrieved. Data collected were analysed using factor analysis to identify the major factors influencing pedestrian accidents, while item analysis was used to assess responses obtained from the Likert-scale questionnaire.

4. Findings and Discussion

Factors that Influence Pedestrian Accidents while on Transit in the Study Area

This section examines the perceived factors influencing pedestrian accidents along major traffic corridors in Calabar. The analysis focused on roads including Murtala Mohammed Highway, Marian Road, Etta Agbor Road, and Calabar Road. Descriptive statistics and factor analysis were employed to identify the most significant variables contributing to pedestrian accidents in the study area.

The descriptive statistics revealed high mean values across several variables, indicating strong agreement among respondents regarding the major causes of pedestrian accidents. Variables such as running across the road without looking (Mean = 4.45), poor enlightenment (Mean = 4.46), nature of pedestrian crossing design (Mean = 4.41), age factor (Mean = 4.31), traffic intensity (Mean = 4.24), and lack of street lighting (Mean = 4.15) were ranked among the most significant factors influencing

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pedestrian accidents. The standard deviation values further showed reasonable consistency in respondents' opinions across the sampled population of 787 respondents.

Table: 4.1 Descriptive Statistics

Variables	Mean	Std. Deviation	Analysis N
Pedestrian traffic violation	4.07	1.238	787
Alcohol intake	2.75	1.504	787
Motorist distraction	2.74	1.338	787
Traffic intensity	4.24	1.060	787
Defective vehicle lighting system	4.05	1.186	787
Pedestrian distraction	3.93	1.299	787
Use of a cell phone	2.21	1.267	787
Over speeding	2.37	1.333	787
Inconsideration for other road users	2.13	1.385	787
Fatigue driving	2.36	1.404	787
Driving/riding against traffic	2.69	1.441	787
Improper turning	3.19	1.353	787
Inadequate safety and security devices	3.55	1.362	787
Twilight hour	3.18	1.214	787
Inadequate road signs, signals, and markings	4.02	1.248	787
Defective horn	3.66	1.572	787
Pedestrian height and weight	3.20	1.449	787
Tyre burst/removal on motion.	3.53	1.235	787
Brake failure	3.79	1.299	787

Source: Researcher's Computation (2025)

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Table: 4.2 Descriptive Statistics (Cont. 1)

Variables	Mean	Std. Deviation	Analysis N
Failure to use the crossing provision	2.72	1.499	787
Drivers' inexperience	3.34	1.048	787
Running/walking across the road without looking	4.45	.963	787
Lack of street light	4.15	1.116	787
Traffic situation	4.11	1.236	787
Weather condition	3.86	1.206	787
Lack of provision of a pedestrian crossing or sidewalk	4.07	1.160	787
Poor enlightenment	4.46	.954	787
Age factor	4.31	1.102	787
Nature of pedestrian crossing design	4.41	.992	787

Source: Researcher's Computation (2025).

Communalities

The communalities extraction values ranged from 0.538 to 0.889, indicating that the extracted factors explained a substantial proportion of variance in the observed variables. Variables such as inconsideration for other road users (.889), fatigue driving (.844), defective vehicle lighting system (.833), and use of cell phone while driving (.810) recorded high extraction values, suggesting strong contributions to pedestrian accident occurrence in the metropolis.

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Table 4. 3 Communalities

Variable	Extraction	Variable	Extraction
Pedestrian traffic violation	.797	Defective horn	.598
Alcohol intake	.690	Pedestrian height and weight	.538
Motorist distraction	.763	Tyre burst/removal on motion	.733
Traffic intensity	.772	Brake failure	.768
Defective vehicle lighting system	.833	Failure to use the crossing provision	.629
Pedestrian distraction	.744	Drivers' inexperience	.766
Use of a cell phone	.810	Running/walking across the road without looking	.676
Over speeding	.794	Lack of street light	.774
Inconsideration of other road users	.889	Traffic situation	.691
Fatigue driving	.844	Weather condition	.654
Driving/riding against traffic	.777	Lack of provision of a pedestrian crossing or sidewalk	.717
Improper turning	.593	Poor enlightenment	.713
Inadequate safety and security devices	.795	Age factor	.735
Twilight hour	.675	Nature of pedestrian crossing design	.716
Inadequate road signs, signals, and markings	.694		

Extraction Method: Principal Component Analysis.
Source: Researcher's Computation (2025).

Rotated Component Matrix

The rotated component matrix for the factors influencing pedestrian accidents in the study area, as shown in Tables 4.4 and 4.5, presents the various loading factors for the extracted components. This value could be adjusted, as shown below, to the proper loading factors for the extracted component. The table shows the various loading factors based on the analysed data. As shown in tables 4.4 and 4.65, data below .5 were suppressed, and the result achieved shows component 1 has a higher loading factor, which means it has a more direct impact or significance for the set of analysed data. The data were also sorted by size and level of significance.

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Table: 4.4 Rotated Component Matrix[a]

Variables	Component				
	1	2	3	4	5
Var0009	.904	.222	.070	.061	.121
Var0007	.835	.251	.029	.070	.212
Var0010	.794	-.171	.313	.163	.244
Var0008	.746	.352	-.038	-.035	.332
Var0011	.718	.159	.363	.318	-.050
Var0003	.627	.400	-.097	.437	.096
Var0002	.602	.496	.003	.259	.118
Var0020	.506	.414	.358	.200	.183
Var0012	.456	.318	.424	.285	.151
Var0017	.393	.205	.351	.379	.273
Var0023	.208	.798	.282	.122	-.007
Var0026	.247	.751	.281	.100	.055
Var0029	.185	.728	.385	.003	-.057
Var0024	.126	.711	.057	.361	.190
Var0015	.187	.685	.185	.371	.135
Var0025	.164	.655	.138	.264	.330

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalisation
Source: Researcher's Computation (2025).

Table: 4.5 Rotated Component Matrix[a] (Cont. 1)

Variables	Component				
	1	2	3	4	5
Var0014	.296	.506	.382	393	-.175
Var0027	.122	.225	.763	.254	.007
Var0021	.075	.293	.763	.261	.155
Var0028	.191	.336	.708	.282	.064
Var0022	-.028	.131	.700	.376	.165
Var0005	.233	.220	.314	.788	.103
Var0004	.138	.249	.300	.766	.120
Var0006	.073	.172	.378	.740	.134
Var0001	.205	.180	.530	.657	.101
Var0013	.293	.507	.336	.573	-.103
Var0016	.222	-.080	-.058	.018	.734
Var0018	.331	.234	.165	.142	.722
Var0019	.123	.214	.420	.182	.706

Extraction Method: Principal Component Analysis.

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https://doi.org/10.5281/zenodo.21008214

Rotation Method: Varimax with Kaiser Normalisation
Source: Researcher's Computation (2025).

Rotation coverage in 7 iterations. Each original variable tends to be associated with one of the components/factors, and each factor represents only a small portion of the variables. In addition, the components can often be interpreted from the opposition of a few variables with positive loadings to a few variables with negative loadings. Varimax seeks a rotation of the original factors such that the variance of the loadings is maximised, which amounts to maximisation.

The scree plot in Figure 4.1 below shows that five values are above the eigenvalue of 1, while other potential factors were below the eigenvalue and were not extracted. The rotated component matrix identified five major components with eigenvalues greater than one. The first component recorded the highest loading factors and therefore represented the most influential dimension affecting pedestrian accidents. Variables strongly associated with this component included speeding, pedestrian distraction, fatigue driving, motorist distraction, traffic violation, and driving against traffic. This suggests that behavioural and traffic-related factors constitute the dominant causes of pedestrian accidents within the study area.

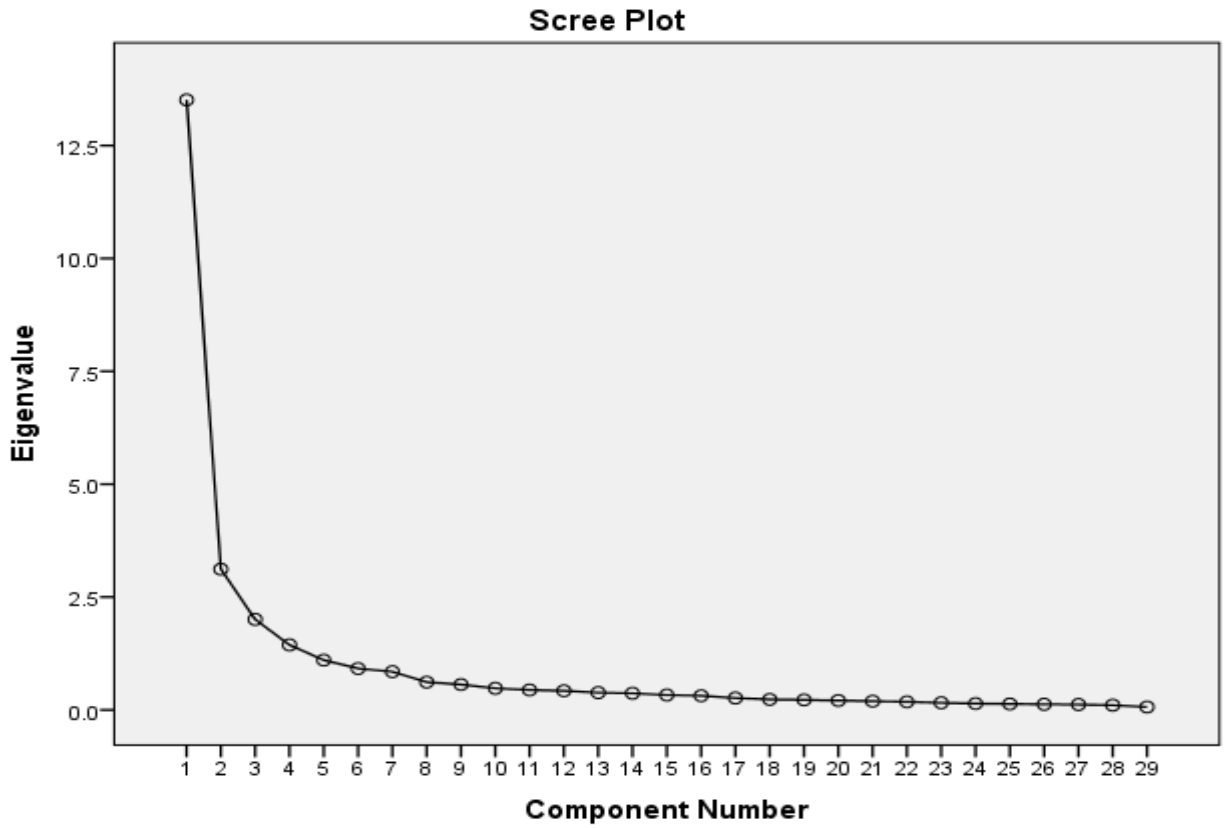

Figure 4.1 Scree plot

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Table 4.6 Summary of Results with the Clusters

Creative label	Factor code	Variable Number	Variable	Factor loading
Human Error	Factor 1	Var09	Inconsideration for other roads users	0.904
		Var07		0.835
		Var10	Use of a cell phone	0.794
		Var08	Fatigue driving	0.746
		Var11	Over speeding	0.718
		Var03	Driving/riding against traffic	0.627
		Var02	Motorist distraction	0.602
		Var20	Alcohol intake	0.506
			Failure to use the crossing provision	
Environmental Concern	Factor 2	Var23	Lack of street light	0.798
		Var26	Lack of provision of a pedestrian crossing or sidewalk	0.751
		Var29	Nature of pedestrian crossing design	0.728
		Var24		0.711
		Var15	Traffic situation	0.685
		Var25	Inadequate road signs, signals, and markings	0.655
		Var13	Weather condition	0.507
		Var14	Inadequate safety and security devices	0.506
			Twilight hour	
Awareness Concern	Factor 3	Var27	Poor enlightenment	0.763
		Var21	Drivers inexperience	0.763
		Var28	Age factor	0.708
		Var22	Running/walking across the road without looking	0.700
		Var01	Pedestrian traffic violation	0.530
Safety/Enforcement Concern	Factor 4	Var05	Defective vehicle lighting system	0.788
		Var04	Traffic intensity	0.766
		Var06	Pedestrian distraction	0.740
		Var01	Pedestrian traffic violation	0.657
		Var13	Inadequate safety and security devices	0.573
Vehicle Condition/Mechanical Concern	Factor 5	Var16	Defective horn	0.734
		Var18	Tyre burst and removal on motion	0.722
		Var19	Brake failure	0.706

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https://doi.org/10.5281/zenodo.21008214

Source: Researcher's Computation (2025).

The summary of results with the clusters for the factors that influence pedestrian accidents in the study area, in Table 4.6 above, presents the principal component analysis of the variables. The table presented 5 factors based on the eigenvalue of > 1 and factor loading greater than 0.500. The cluster, which was creatively labelled, was extensively discussed in order to reveal its influence on pedestrian accidents in Calabar Metropolis, Cross River State, Nigeria, with a view to proffering solutions that will increase usage.

From the result, the first two factors, which have been labelled as human error and environmental concern, are composed of eight (8) variables each, and they are considered principal factors, because they have the highest number of variables among other factors. Also, the factor loading of the variables under the cluster is all positively loaded and ranges from 0.506 to 0.904, which implies that the cluster is very sturdy. Therefore, those variables are considered very important.

However, the third and fourth cluster, labelled as Awareness and safety/enforcement concern, composed of five (5) variables each, also contribute greatly to the factors that influence pedestrian accidents in Calabar Metropolis, while the fifth factor, labelled as vehicle condition/mechanical concern, is composed of three (3) variables. They are all positively loaded and are considered very important, and also contribute greatly to the factor that affects pedestrian accidents in the study area.

Table 4.7 FACTOR 1 (Human Error Concern Cluster)

Variable no:	Description	Factor Loading
Var09	Inconsideration of other road users	0.904
Var07	Use of a cell phone	0.835
Var10	Fatigue driving	0.794
Var08	Over speeding	0.746
Var11	Driving/riding against traffic	0.718
Var03	Motorist distraction	0.627
Var02	Alcohol intake	0.602
Var20	Failure to use the crossing provision	0.506

Source: Researcher's Computation (2025).

The first cluster in Table 4.7 above consists of eight (8) variables and is creatively labelled as human error. The factor loading ranges from 0.506 to 0.904 and is all positively loaded. The cluster is concerned with human contribution to pedestrian accidents while on transit. However, the outcome of this survey shows inconsideration of other road users of var09 with a factor loading of 0.904 as the highest factor loading, which indicates that it's one of the key determining factors that influence pedestrian accidents in the study area. The cluster also raised serious concern on the use of cell phone,

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fatigue driving, overspeeding, driving/riding against traffic, motorist distraction, alcohol intake and failure to use crossing provision of var07, var10, var08, var11, var03, var02 and var20 with factor loading of 0.835, 0.794, 0.746, 0.718, 0.627, 0.602 and 0.506 respectively. The contribution of all these variables to the factor that influences pedestrian accidents while on transit in Calabar Metropolis cannot be overemphasised.

Table 4.8 FACTOR 2 (Environmental Concern Cluster)

Variable no:	Description	Factor Loading
Var23	Lack of street light	0.798
Var26	Lack of provision of a pedestrian crossing or sidewalk	0.751
Var29	Nature of pedestrian crossing design	0.728
Var24	Traffic situation	0.711
Var15	Inadequate road signs, signals, and markings	0.685
Var25	Weather condition	0.655
Var13	Inadequate safety and security devices	0.507
Var14	Twilight hour	0.506

Source: Researcher's Computation (2025).

The second cluster in Table 4.8 above consists of eight (8) variables and is creatively labelled as the environmental concern cluster. The factor loading ranges from 0.506 to 0.798 and is all positively loaded. The cluster is concerned with the surroundings, conditions and nature that contribute to pedestrian accidents while on transit. However, the outcome of this survey on surroundings and conditions shows lack of street light, lack of provision of pedestrian crossing or sidewalk, nature of pedestrian crossing design, traffic situation, inadequate road sign, signal and markings, inadequate safety and security devices of var23, var26, var29, var24, var15 and var13 with factor loading of 0.798, 0.751, 0.728, 0.711, 0.685 and 0.507 respectively. The outcome of the survey with nature has to do with weather conditions and twilight hour of var25, var14, with factor loading of 0.655 and 0.506, respectively. The result shows that all the variables are highly significant to the factors that influence pedestrian accidents in Calabar Metropolis.

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Table 4.9 FACTOR 3 (Awareness Concern Cluster)

Variable no:	Description	Factor Loading
Var27	Poor enlightenment	0.763
Var21	Drivers inexperience	0.763
Var28	Age factor	0.708
Var22	Running/walking across the road without looking	0.700
Var01	Pedestrian traffic violation	0.530

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Source: Researcher's Computation (2025).

The third cluster in Table 4.9 above consists of five (5) variables and is creatively labelled as the awareness concern cluster. The factor loading ranges from 0.530 to 0.763 and is all positively loaded. The cluster is concerned with the lack of knowledge and exposure that contributes to pedestrian accidents while on transit. However, the outcome of this survey shows poor enlightenment, driver inexperience, age factor, running/walking across the road without looking and pedestrian traffic violation of var27, var21, var28, var22 and var01 with factor loading of 0.763, 0.763, 0.708, 0.700 and 0.530, respectively. However, var27 and var28 have the same factor loading of 0.763 and are very high; they are considered in this cluster to be the key determinants considered all other variables as significant of the factors that influence pedestrian accidents in Calabar Metropolis.

In summary, the second and third components were associated mainly with infrastructural and environmental variables such as inadequate road signs, poor street lighting, weather conditions, traffic situation, lack of pedestrian crossings, and poor road design. The fourth and fifth components reflected vehicle-related and demographic factors, including brake failure, tyre burst, defective lighting systems, and age-related pedestrian vulnerability.

Table 4.10 FACTOR 4 (Safety and Enforcement Concern Cluster)

Variable no:	Description	Factor Loading
Var05	Defective vehicle lighting system	0.788
Var04	Traffic intensity	0.766
Var06	Pedestrian distraction	0.740
Var01	Pedestrian traffic violation	0.657
Var13	Inadequate safety and security devices	0.573

Source: Researcher's Computation (2025).

The fourth cluster in Table 4.10 above consists of five (5) variables and is creatively labelled as the safety and enforcement concern cluster. The factor loading ranges from 0.573 to 0.788 and is all positively loaded. The variables 05, var04 and var06, which show defective vehicle lighting system, traffic intensity and pedestrian distraction with factor loading of 0.788, 0.766 and 0.740, respectively, are highly loaded and considered the key determinant for this cluster. The var01 and var13 show pedestrian traffic violation and inadequate safety and security devices, with factor loading of 0.657 and 0.573, respectively, and are also considered to be important and contributory factors to the factors that influence pedestrian accidents in Calabar Metropolis.

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Table 4.11 FACTOR 5 (Vehicle Condition and Mechanical Concern Cluster)

Variable no:	Description	Factor Loading
Var16	Defective horn	0.734
Var18	Tyre burst/removal on motion	0.722
Var19	Brake failure	0.706

Source: Researcher's Computation (2025).

The fifth cluster in Table 4.11 above consists of three (3) variables and is creatively labelled as the vehicle condition and mechanical concern cluster. The factor loading ranges from 0.734 to 0.788; they are all highly and positively loaded. However, the outcome of this survey raised serious concerns in all the var16, var18 and var18, which show defective horn, tyre burst/removal on motion and brake failure with factor loading of 0.734, 0.722 and 0.706, respectively. All of these variables are considered highly risky factors that influence pedestrian accidents while on transit in Calabar Metropolis.

These findings are consistent with previous studies by Budzynski et al. (2019), Hafeez et al. (2020), and Macioszek et al. (2023), which identified speeding, driver distraction, poor road infrastructure, and environmental conditions as major determinants of pedestrian accidents. Similarly, the findings support the works of Tefe et al. (2020) and Odufuwa et al. (2022), who found that inadequate pedestrian facilities and unsafe crossing behaviour significantly increase pedestrian crash risks in urban areas.

The findings also reinforce the Theory of Planned Behaviour by demonstrating that pedestrians' and drivers' behaviours are strongly influenced by perception, attitude, and surrounding traffic conditions. Unsafe crossing practices, impatience, distraction, and non-compliance with traffic regulations increase exposure to accidents along busy traffic corridors. Overall, the study advances scholarly understanding by showing that pedestrian accidents in Calabar Metropolis are multidimensional and shaped by behavioural, infrastructural, environmental, and vehicular factors simultaneously. The study therefore highlights the need for integrated transport planning strategies involving improved pedestrian infrastructure, stricter traffic law enforcement, public safety awareness, and better urban road design to reduce pedestrian accident occurrence within the metropolis.

5. Conclusion and Recommendations

This study examined the perceived factors influencing pedestrian accidents along major traffic corridors in Calabar. The findings revealed that pedestrian accidents are largely influenced by behavioural factors such as unsafe road crossing, pedestrian and driver distraction, speeding, and traffic violations, as well as infrastructural factors including inadequate pedestrian crossings, poor street lighting, weak road signage, and poor crossing design. These findings show that pedestrian safety in

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https://doi.org/10.5281/zenodo.21008214

Calabar Metropolis is shaped by a combination of human behaviour, traffic conditions, and road environment.

The study contributes to existing knowledge by providing empirical evidence on pedestrians' perceptions of accident causes within an urban Nigerian context. This is important for transport planning and road safety management, especially in rapidly growing cities where pedestrian movement remains high.

Based on the findings, the study recommends improved provision of pedestrian facilities such as sidewalks, zebra crossings, pedestrian bridges, and street lighting along major corridors. Government and traffic management agencies should strengthen road safety enforcement, install clearer traffic signs and signals, and promote public awareness campaigns on safe road crossing behaviour for both pedestrians and motorists. Urban planners should also integrate pedestrian safety considerations into road design and corridor development projects.

A limitation of this study is that it relied mainly on questionnaire responses and pedestrians' perceptions within selected corridors in Calabar Metropolis; therefore, the findings may not fully represent all urban areas. Future research can expand to other cities in Nigeria and incorporate accident records, GIS mapping, and direct behavioural observation to provide broader evidence on pedestrian accident patterns and safety interventions.

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