



ROAD TRAFFIC CRASHES AND THEIR SOCIOECONOMIC IMPACTS IN SABON GARI LOCAL GOVERNMENT AREA, NIGERIA

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Abstract

This study examined the impact of road traffic crashes (RTCs) on the social and economic activities in Sabon Gari Local Government Area of Kaduna State, Nigeria. It aims to identify the major causes of RTCs, evaluate their socioeconomic impacts, and recommend effective mitigation strategies. A cross-sectional design was used utilizing both primary and secondary data. Primary data was collected through 100 structured questionnaires administered to the public in high-traffic zones like PZ, Kwangila, and Samaru and secondary data was obtained from the Federal Road Safety Corps (FRSC) Sabon Gari Command between 2021 – 2024. An examination of the data indicated that RTCs were common, with 1, 051 crashes occurring over a 4-year period causing 252 deaths and injuring 1, 233 people. The findings indicate that speed violation (SPV) was the most common single contributing factor of accidents. There were considerable socioeconomic impacts, with businesses disrupted, lost income and mobility restricted. Besides, 72% of people affected in crashes became casualties emphasizing the vulnerability among road users. This study concludes that RTCs in Sabon Gari LGA is a major public health and economic challenge, to large extent attributable to preventable human factors. It urges government and all concerned agencies to step up public enlightenment, the enforcement of traffic laws, particularly speed limits as well as the rehabilitation of road networks in addition to reinforcing capacity of FRSC operatives so as to minimize both frequency and impact of RTCs in the region.

Keywords: road traffic crashes, socioeconomic impact, human factors

1 Introduction

Road traffic crashes (RTCs) are a significant global public health and development issue. It is estimated that 1.19 million people are reported to die yearly from RTCs [1] and about 20-50 million people will be injured in nonlethal crashes; many of whom will become permanently disable. RTCs are currently the leading cause of death for individuals aged 5 to 29 years, disproportionately affecting young people and economically productive populations [2]. Overall, RTCs have far-reaching socioeconomic consequences that go beyond immediate physical injuries. In developing countries such as Nigeria, these impacts are particularly severe due to weak social safety nets, under-resourced healthcare systems, and poor road safety governance [3, 4]. RTCs in semi-urban areas have gained attention among scholars because of the high occurrence and severe socio-economic repercussions [3, 5]. A great deal of research in a range of areas has explored the demographic characteristics, impacts on economy, and the temporal-spatial expansion of RTCs as they pass through these intermediate zones between urban and rural areas [2, 5].

A recent cross-sectional adolescent health study from semi-urban areas showed a high prevalence of RTC involvement, with the highest risk rate in adolescents and young adult age group [6]. Gender differences were noted as well with males frequently reporting greater crash involvement. Characteristic to the accidents is that its rate has surged in recent years, and it demonstrated distinct seasonal peaks, highlighting the necessity of traffic safety education [7].

Additionally, retrospective study among RTC cases received in semi-urban medical facilities with high injury rates and frequent fatalities compounded by late arrival to hospital and shortage of trauma care services [8]. This underscores the perennial insufficiency of prehospital care and post-crash medical attention in these areas. A broader hospital-based study of RTC victims investigated the far-reaching economic impact associated with RTCs [9]. Majority of victims had been economically active, and many of them were earning a below poverty income. Victims were usually vulnerable road users, such as pedestrians, commercial passengers or motorcyclists. The financial consequences (including direct medical costs) in addition to productivity loss from a lack of work due to disability resulting from TBI, placed further pressure on the affected families and informal caregivers [10]. In several semi-urban towns, researchers have used regression models to forecast crash likelihood according to local road and traffic attributes [11, 12]. Such models have been useful in predicting crash hotspots and revealing distinctive patterns of semi-urban crash risk as opposed to rural or urban areas alone and lend support to the need for local evidence-based road safety interventions. Spatial and temporal analyses have revealed several distinct accident blackspots within the semi-urban areas [13]. Spikes in crash rates are typically associated to seasonal commuters and holidays. They state that semi-urban area by virtue of having moderate traffic density but poorly maintained has, would need location-specific road safety interventions as well as regular enforcement exercises [14].

In previous studies semi-urban areas had been consistently found to be at risk of RTCs. These affected populations are typically young and have income earning potential that is high, thereby having significant effects on household income, household health care cost and the broader community development. Studies reported in the literature justify the necessity for focused interventions as lane widening, retro-reflective road marking and programmed enforcement of law to control RTCs and its severity in semi-urban areas. Hence, this study investigates the effects of such crashes on people's daily economic and socio-cultural transactions in Sabon Gari LGA with a view to propose interventions geared towards ameliorating their impacts.

2 Methodology

2.1 Study area

Sabon-Gari Local Government Area is an urban–peri urban area in Kaduna State, northern Nigeria, characterized by dense settlement, vibrant commercial activities, diverse ethnic composition, a tropical savanna climate, and strategic importance within the Kaduna metropolis, located at approximately 11.12° N, 7.44° E.

2.2 Data collections and analysis

Primary and secondary data were used in this research. Primary data were sourced through 100 sets of structured questionnaires which were distributed in some commercial places (PZ, Kwangila and Samaru). Demographic characteristics (age, sex, educational status), vehicle ownership and purpose of use (private or business related), perceived causes of crashes and prior crash involvement were recorded. Secondary RTC data for 2021–2024 were obtained from the Federal Road Safety Commission (FRSC), RS1. 13 Command, PZ-Sabon Gari.

The dataset consisted of monthly numbers of crashes, casualties (number involved), persons injured or killed, gender of the casualty, age group (child and adult) and routes concerned. Analysis was performed in Microsoft Excel for all data. Descriptive statistics methods were used to calculate frequencies, mean values, percentages and proportions. The primary and secondary datasets were analyzed independently before being compared to detect overlaps in crash causes, patterns and socio-economic consequences.

3 Results and discussion

Data presented in this study were analyzed so as to examine the influence of road traffic crash on socioeconomic in Sabon Gari and to find measures in reducing road traffic crashes. More specifically the study aimed at examining the various crash factors; that is the human factors, vehicle factors roadway conditions and the weather conditions. Also, the various routes were critically observed to determine which route was more affected.

3.1 The primary data

The respondents are those that attended to the questionnaires and the personal information is as follow. A total of one hundred responses were obtained and seventy-four of them were male while twenty-six were female. Fifty-eight people were vehicle owners while forty-two were not vehicle owners. 35.8% of the vehicle owners were for private purposes while the remaining 64.2% were for commercial uses (table 1).

Table 1 Information of those questioned

Sex		Vehicle Ownership		Purpose	
Male	Female	Yes	No	Private	Commercial
74	26	58	42	13	40

3.1.1 Causes of road traffic crashes

The public also gave their responses on the various causes of road traffic crashes based on some selected common causes just to be specific on some certain causes. Their responses are as shown in table 2.

Table 2 Public response to causes of road traffic crashes in some roads in Sabon Gari (N = 100)

Causes of RTC	Percentage [%]
Over speeding	66%
Reckless driving	14%
Poor road condition	10%
Mechanical failure	2%
Drunk driving	3%
Weather Conditions	5%

Based on the response of the public through the questionnaires, 66% believed that speed is responsible for road traffic crashes in Sabon Gari, 14% believed careless use of the road is responsible for road traffic crashes in Sabon Gari, 10% believed bad road, 2% believed overloading, 3% believed disobedient of traffic laws are responsible while 5% believed road

traffic crashes in Sabon Gari are caused by weather conditions. Majority of the people (66%) believed that speed is the major cause of road traffic crashes in Sabon Gari. They believe that most road traffic crashes could have been prevented from happening if the speed of the vehicle as the time of the crash was too high or not excessive. Also, that in a situation where the crashes could not be avoided, the severity level would have been reduced if the speed of the vehicle was not excessive.

3.1.2 The various crash factors

RTC factors are mostly comprehensively grouped into the human factors, vehicle factors, roadway conditions and environmental factors. The human factors are so numerous that they keep coming in different forms. Therefore, it is always convenient to give a compressive grouping of the various factors. Table 3 shows the various crash factors and the response of the people based on their understanding of these factors with respect to road traffic crashes in Sabon Gari.

Table 3 Public response to causes of road traffic crashes in some roads in Sabon Gari (N = 100)

Crash Factors	Response
Human Factors	72%
Vehicle Factors	9%
Roadway Conditions	17%
Environmental Factors	2%

Out of the one hundred responses received from the public, seventy-two (72) of them, which represent 72%, believe that human factors are the major problems on our road in Sabon Gari. They believed that roadway conditions come second as about seventeen people, which is 17%, went for the roadway conditions. Therefore, bad roads, sharp bend, pot holes, etc., are problems on our roads. Vehicle factors came third base on people’s opinions. Most vehicle owners, especially the commercial vehicle owners, lack adequate vehicle maintenance. This lack of maintenance easily results in engine failure and other mechanical failure. The list among the factors is the environmental condition which was just two percent (2%) of the responses. Base on response of the public through the questionnaire seventy-one (71) of them which represents (71%) believe that it effect moderately. Some have believe as no effect comes second with 22%. Moderately comes third base on people opinion, the least is greatly (figure 1). Figure 1 is showing the response to socioeconomic effect of road traffic crash which majority of the respondents believe the effect was slightly.

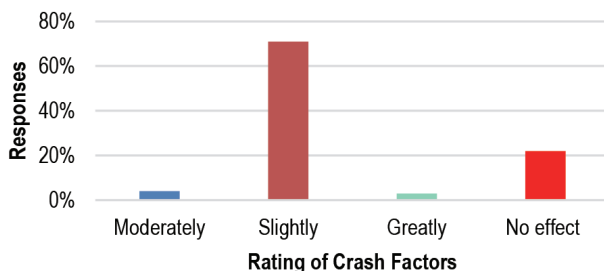


Figure 1 Rating of the various crash factors by the respondents

3.2 The secondary data

The secondary road traffic crash data collected from the Federal Road Safety Commission were from 2021, 2022, 2023, and 2024; and they contain the various number of crash severity, number of people involved with respect to gender, age and sex.

3.2.1 Crashes and severity levels

A total of two hundred and fifty-six (256) road traffic crashes were recorded in the year 2021 with a total of fifty-two (52) fatal cases, one hundred and thirty-seven (137) serious cases and sixty-five (65) minor cases (table 4). A total of two hundred and sixty (260) road traffic crashes were recorded in the year 2022 with a total of fifty nine (59) fatal cases, one hundred and twenty-eight (128) serious cases and seventy-three (73) minor cases. Also, a total of two hundred and forty-nine (249) road traffic crashes were recorded for the year 2023 with a total of fifty-eight (58) fatal cases, one hundred and twenty-two (122) serious cases and sixty-nine (69) minor crash cases. Two hundred and eighty-six (286) road traffic crashes were recorded in the year 2024 with a total of sixty-one (61) fatal cases, one hundred and thirty-nine (139) serious cases and eighty-six (86) minor cases. Therefore, a total of one thousand, and fifty-one (1051) total cases were recorded from 2021 to 2024 with two hundred and thirty (230) fatal cases, five hundred and twenty-six (526) serious cases and two hundred and ninety-three (293) minor cases.

Table 4 Annual crash record for the four years in view

Year	Fatal	Serious	Minor	Total
2021	52	137	65	256
2022	59	128	73	260
2023	58	122	69	249
2024	61	139	86	286
Total	230	526	293	1, 051

3.2.2 Casualties and people involved

Two hundred and fifty-two (252) people lost their lives for the four years in view. One thousand two hundred and thirty-three (1233) people were injured, and a total of two thousand one hundred forty-seven (2147) people were involved in road traffic crashes in Sabon Gari for the years 2021, 2022, 2023 and 2024. The casualty levels, total casualties and the number of people involved are shown in table 5.

Table 5 Casualty levels and the total number of people involve in the crash

Year	Traffic fatality	Traffic injured	Total casualties	People involved
2021	67	387	454	612
2022	45	201	246	379
2023	62	279	341	455
2024	78	366	444	701
Total	252	1, 233	1, 485	2, 147

Furthermore, an analysis of road traffic crash data from 2021 to 2024 shows that 2, 147 people were involved in collisions. Of these, 1, 485 sustained casualties (fatalities or injuries), leaving 932 individuals unharmed. This reveals a significant disparity: 69% of individuals involved in a crash were likely to be killed or injured, while only 31% escaped unharmed. The month with major concern for the year is January because this is the month where crashes, injuries and death were always high. Table 6 shows the causes of road traffic crashes in Sabon Gari as recorded by the Federal Road Safety Commission. Speed is the major cause as it contributed directly to about 202 crashes out of the total 665 crashes recorded between 2021 to 2024.

Table 6 Recorded causes of RTCs in Sabon Gari by the FRSC for the years 2021 to 2024

S/No	Probable causes	Code	Outcome
1	Speed violation (SPV)	SPV	202
2	Loss of control (LOC)	LOC	50
3	Dangerous driving (DGD)	DGD	71
4	Tire burst (TBT)	TBT	51
5	Brake failure (BFL)	BFL	20
6	Wrongful overtaking (WOT)	WOT	60
7	Mechanically deficient vehicle (MDV)	MDV	21
8	Bad road (BRD)	BRD	30
9	Overloading (OVL)	OVL	20
10	Sleeping on steering (SOS)	SOS	10
11	Driving under alcohol/drug influence (DAD)	DAD	50
12	Use of phone while driving (UPWD)	UPWD	14
13	Fatigue (FTQ)	FTQ	20
14	Poor weather(PWR)	PWR	16
15	Sign light violation (SLV)	SLV	10
16	Others	OTH	20
TOTAL			665

4 Conclusion

This research investigates the effects of RTCs on socio-economic activity in Sabon Gari LGA with reporting and records of FRSC (2021–2024) and a sample of 100 structured questionnaires from PZ, Kwangila, and Samaru. During the four-year span, there were 1, 051 crashes for an annual average of 263. There were an average of 57 deaths per year, 132 serious crashes and 73 minor crashes. In 2024 there was a total of 286 crashes, an increase of only 12% over that in 2021. There were monthly peaks in January and February corresponding to high volume of commercial (business) and post-holiday travel. Human error was cited as being the biggest contributor in both databases. Nearly two-thirds (66%) blamed over-speeding, and three-quarters attributed accidents in general as stemming from human failings. FRSC record indicated speed violation (202 of 665 coded cases) as predominant cause, while dangerous driving (71) and wrongful overtaking (60) followed. Car and street condition were factors but not topmost. Among 2, 147 people in total, casualties included 1, 485 (69%) with 252 fatalities and 1, 233 injuries; the proportion was higher for males (68% of the victims). RTCs did materially crush trade, movement, schooling and access to healthcare. The results indicate that RTC in Sabon Gari is preventable with improved enforcement, behavior change and infrastructural intervention.

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