

Drivers' Seatbelt Usage, In Minna, Northern Nigeria

S. S. Kolo¹., O. O. Adeleke², I. T. Yusuf², Abdulrahman H. S¹, Shehu¹ M.
and Hawa¹ A.

¹Department of Civil Engineering, Federal University of Technology Minna,
Niger State, Nigeria.

²Department of Civil Engineering, University of Ilorin, Ilorin,
Kwara State, Nigeria.

s.kolo@futminna.edu.ng +2348036879855

Abstract

Five settlements in Minna, Niger State capital were examined to determine drivers' attitudes and behaviours regarding usage of seatbelts. Multiple data Collection methods consisting of semi-structured interviews to create questionnaire for an in-person survey for 100 drivers each, for five different locations that was used. The questions explored why Minna drivers used or do not use seatbelts and what they think would be the best interventions to increase the rate of seatbelt usage in Minna by drivers. The outcome of all the aforementioned were translated into charts and following outcome was obtained. The composition of gender, for the respondent are 87% male and 13% female, showing that, out of this number 33% are married while 64% are unmarried and 3% are divorced. The finding also showed that the most prevalent age of driver is between age 36 to age 45 and it is said to be the productive age. It was also discovered that majority of the driver interviewed are Nigerlite constituting 64% of those interviewed. It was also noted that, a driver is 87% safer when seat belt is used as compared to not using seatbelt of 37% safe when accident or crash happen. It was therefore advised that sustained radio and television advertisement be done to encourage the use of seatbelt in Northern Nigeria.

Keywords

Attitude, Behaviour, Drivers, Accident and Seatbelt use.

1. Introduction

Minna is a rapidly developing city that is home to a population of over 495,500 people, the population has grown with 3.54% from the previous year

of 2022. (UN World Urbanization Prospects). Along with the increase in population and development in Minna, this has led to growth in the demand for motor vehicles. The city's increasing demand for passenger cars, buses and trucks has become a thing of great concern. The traffic fatality number in Minna has climbed to an alarming number. The Federal Road Safety Commission (FRSC) recently released frightening statistics on road accidents in Nigeria. According to the Corps Marshal and Chief Executive of the FRSC, Dauda Ali Biu, in the first quarter 2022, (October – December 2022) 3,617 road traffic accidents, with 10,232 injured and 1,608 killed with 22,852 people involved in the accident the report also showed that the highest number of accident occurred at FCT and closely followed by Ogun state (FRSC 4th Quarter Report, 2022). The grim statistics mirror the global death toll on roads, which is currently put at 1.2 million annually. Within the past four months, 2,252 vehicles were involved in road accidents, with over 5,000 persons reportedly injured. Other figures show that Nigeria recorded the highest number of road accidents in the 1980's, which was a period of oil boom. The implication is that if this kind of casualty figure continues, Nigeria risks losing over 26 percent of its Gross Domestic Product (GDP) by the year 2030. This will translate into a hefty \$6 billion loss. These numbers are alarming, and are made more so when it is stated that traffic deaths is the leading cause of death in most developing countries for people up to 45 years of age.

There have been many research studies showing that the number of injuries resulting from vehicle accidents has been significantly reduced by the use of seatbelts, with seatbelts minimizing the extent of those injuries that occurred (Bendak 2020; Cooper, 2021; ACEA 2010; Kim et al, 2022; Nkamura et al) by restraining people to their seat during vehicle accidents. (Seatbelts prevent the occupants from being ejected from the vehicle or from hitting objects that are close by, thereby reducing the severity of injuries suffered). According to the Highway Traffic Safety Administration (NHTSA, June 2009), use of seatbelts in passenger cars saved an estimated 13,250 lives in the US in 2008 and over 75,000 lives between 2004 and 2008 (Quimby and Watt, 2019; Schectman et al, 2020).

A few studies have provided information on the design of interventions for developing and low-income countries and cities for improving road safety (e.g., Forjuoh, 2020; ETSC, 2020). One study in particular (i.e., Stevenson et al, 2007) involved a seatbelt intervention project in China. It was reported by

the project investigators that the level of change was not as originally expected.

A seat belt or seatbelts, sometimes called safety belt, is a safety harness designed to secure the occupant of a vehicle against harmful movement that may result from collision or sudden stop. As part of an overall automobile passive safety system, seat belts are intended to reduce injuries by stopping the wearer from hitting hard interior elements of the vehicle, or other passengers (the so-called second impact), are in the correct position for the airbag to deploy and prevent the passenger from being thrown from the vehicle. Seat belts also absorb energy by being designed to stretch during any sudden deceleration so that there is less speed differential between the passenger's body and their vehicle interior, and also to spread the loading of impact on the passengers body (Schectman *et al*, 2021).

The final, so- called 'third impact' after a passenger's body hits the car interior, airbag or seat belts, is that of the internal organs hitting the ribcage or skull. The force of this is the mechanism through which car crashes cause disabling or life threatening injury. The sequence of energy dissipating and speed reducing technologies-crumple zone- seat belt- airbags- padded interior, are designed to work together as a system, to reduce the force of this final impact. (Wikipedia, the free encyclopedia).

Seat belts were invented by George Cayley in the early 19th century, (Andréasson, Rune; Claes-Göran Bäckström , 2020). And the first patent for automobile seatbelt was Edwward J. Claghorn of New York on February 10, 1885. (World bank 2020)

In 1946, Dr. C. Hunter Shelden made a major contribution to the automobile industry with his idea of retractable seat belts. This came about greatly in part from the high number of head injuries coming through the emergency rooms. (May, 2003 Shelden Memorial). He investigated the early seat belts whose primitive designs were implicated in these injuries and deaths. His findings were published in the November 5, 1955 Journal of the American Medical Association (JAMA) in which he proposed not only the retractable seat belt, but also recessed steering wheels, reinforced roofs, roll bars, door locks and passive restraints such as the now-and-ever popular air bag. Subsequently in 1959, Congress passed legislation requiring all automobiles to comply with certain safety standards. (Winston et al, 2020)

American car manufacturers Nash (in 1949) and Ford (in 1955) offered seat belts as options, while Swedish Saab first introduced seat belts as standard in 1958. After the Saab GT 750 was introduced at the New York motor show in 1958 with safety belts fitted as standard, the practice became common place (Allen et al, 2020). Glen Sheren of Mason, Michigan submitted a patent application on March 31, 1955 for an automotive seat belt and was awarded US Patent 2,855,215 in 1958. This was a continuation of an earlier patent application that Mr. Sheren had filed on September 22, 1952. In 1970, the state of Victoria, Australia, passed the first law worldwide making seat belt wearing compulsory for drivers and front-seat passengers. (www.driverstechnology.co.uk/seatbelts.htm.) The first child car seats were invented in 1921, following the introduction of Henry Ford's Model T, however, they were very different from today's car seat. The earliest versions were essentially sacks with drawstring attached to the back seat. (Isabelle Broadhead Child Restraint Measures) Rules 2010:No. 46, Rule 1) (Isabelle (2019).

2.0 Methodology

2.1 Description of project site

The research was carried out in Minna over four months from October to December 2022, from 9am to 5pm daily. Minna was chosen as a study locality because it represents the area with the highest vehicular activities in Niger State. In addition, it also meets the requirement of being a town surrounded by both urban and rural areas, which is typical of any state in Nigeria. Minna also represent a typical state capital in Nigeria in terms of the ethnic composition of the population, living standards and economic development. Minna lies between longitude 8°10' West to 10°4' East and between latitude 3°35' North-east to 7°25' South-west Thus a sample study in Minna has a higher tendency of reflection of the entire state population (Plate I).

The study employed multiple data collection methods and research in multiple settlements in Minna metropolis. Data was collected in five major settlements in Minna; Tunga, Bosso, Gidan kwano, mobil and Tudun Fulani. The data collection methods included (1) in-depth semi-structured interviews to initially explore Minna drivers' attitudes toward seatbelt use (using the

result to develop survey questions), (2) direct observation of drivers for seatbelt usage when entering gas stations, and (3) administration of survey questioners to drivers at the locations mentioned earlier to collect quantitative data in each of the five settlements within Minna

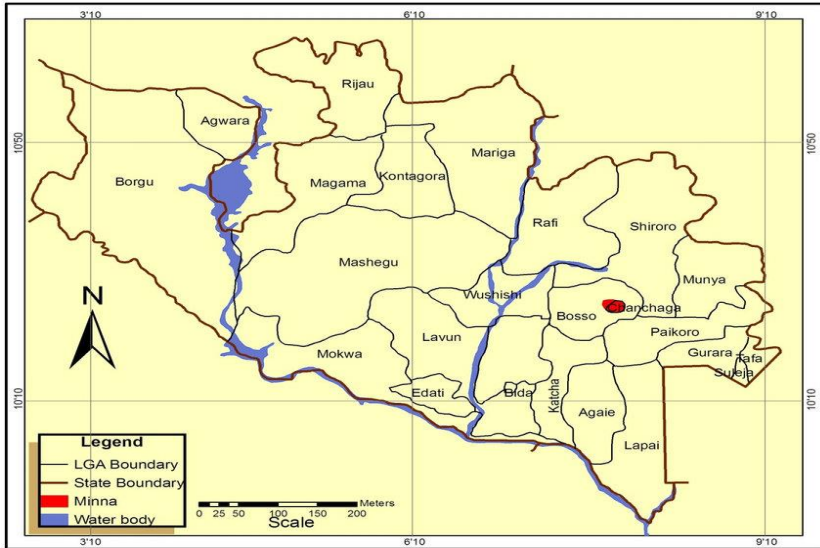


Plate I: Local Government In Niger State

2.2 Sampling method

Questionnaires containing stimulus materials were administered to respondents in three conditions. Condition 1, attitudes towards seatbelt usage, self-report of seatbelt usage. Condition 2, personal characteristics and demographic variables, including age, gender, education, years of driving, driver type (professional/non-professional). Condition 3, self-report of crashes and traffic violations in the prior year. Each condition of the questionnaire also composed of three sections, A, B and C. Section A; consist of general information about the respondent including Age group, gender and education. Section B; Consist of research related questions ranging from reasons why seatbelts are important to adherence levels among the respondents. Section C; Consists of questions relating to involvement in auto crash, years of driving and traffic violations.

2.3 Survey measures

The survey included three parts: (1) attitudes toward seatbelt use, self report of seatbelt use, (2) personal characteristics and demographic variables, including age, gender, education, years of driving, driver type (professional/non-professional), and (3) self report of crashes. The primary part of the survey included questions exploring drivers` attitudes towards seatbelt use, whether or not they generally wear seatbelts, opinions on why Minna drivers use or do not use seatbelts, and potential intervention suggestions for increasing the rate of seatbelt use in Minna. It is believed that the survey items used in this study sampled the content of what was intended to be measured. Content validity refers to the degree to which a measure covers the range of meanings included within the concept (Babbie, 2022). Content validity is assessed by subject matter experts (SMEs) in the area the test covers. The SMEs render an opinion regarding the degree of content validity manifested in the test (Muchinsky, 2021). Our survey items were developed based on the results of interviews with SMEs, and the initial survey questions were reviewed, revised, and pilot tested by actual Minna drivers. It is assumed that this questionnaire achieves content validity.

2.4 Data Collection Procedure

Data were collected at two filling stations in each of the five settlements. It was observed that as the first arriving car entered the station, seatbelt use by the driver was noted. The driver was then approached at the pump station to recruit him/her for the survey. If the driver declined, the next car was observed at the entrance to the station. Participants agreeing to the survey were asked to park their cars in a nearby parking space. A verbal consent statement was given to the participants. It took approximately 10 minutes to complete the survey. No incentive was provided for the survey as it was totally dependent on willingness by the participants. Once the survey process was completed, the next car at the entrance was then observed as it arrived. This method has been previously utilized in Wells et al., (2002). Surveys were conducted with drivers until 20 drivers participated from each filling station. Response rates ranged from 75% to 80%. The total number of survey participants was 100 (10 participants for each of the filling stations per settlement, with a total of 20 participants for each of the five settlements).

3.0 Results and Discussion

Total participants of the seat belt survey was 500 participants out of this number 87 % are male while 13 % are female (Figure 1). It also Figure 2 shows, the marital status of the drivers with 33% single drivers, 64% married drivers and 3% divorced drivers, indicating that married people drives more than unmarried and divorce people. The age of drivers according to Figure 3, 3% of drivers are below age 25 years, 36% drivers are within ages of 26 -35 years, while 45% of drivers are within the ages of 36 - 45 years and 13% of drivers are above the age of 45 years. This means that a majority of Minna drivers falls between the ages of 36 and 45 which is usually the productive age's group. Figure 4 also gave the percentage of state of origin most drivers found in Minna, 10% are from Kaduna State, 64% are from Niger State, 8% are from Kogi State, while 4% are from Kano state and 14% are from Kwara state meaning majority of the drivers are from Niger state.

The educational qualification of drivers (Figure 5) showed that 7% of the drivers has no educational background, 14% of drivers has only elementary education while 17% of drivers has primary education only, 47% of the drivers has secondary education as their highest educational background, 12% of the drivers has tertiary education and 3% of drivers interviewed has post graduate degrees. This means that, the majority of Minna drivers have secondary education. Also, from the Figure 6, it can be seen that there were 76 professional drivers and 24 non-professional drivers. This simply means most of the drivers that were sampled were professionals with an average driving experience of 8 years, showing the effort of the Federal road safety corp. Figure 7, shows the fatality percentages of drivers using seat belt and those without seat belt, when seat belt was used was reduced by 86% as compared to non-usage of seat belt, with fatality only reduced by 14%. Base on the forgoing it was then discovered that seat belt can safe life up to 86% in case of road acciden

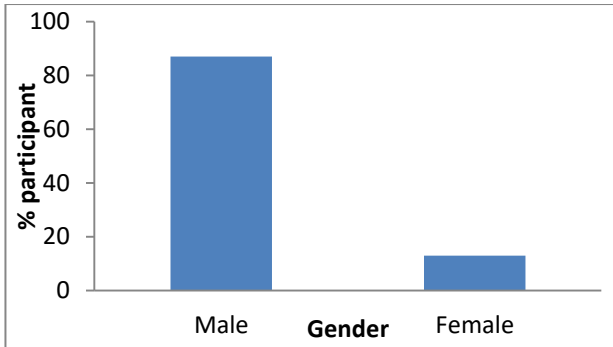


Figure 1: Gender of Participants

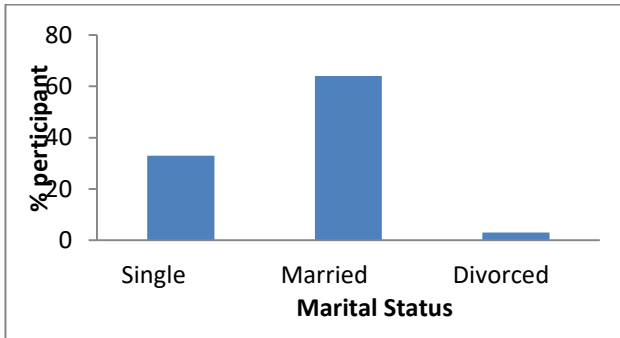


Figure 2: Marital Status of Participants

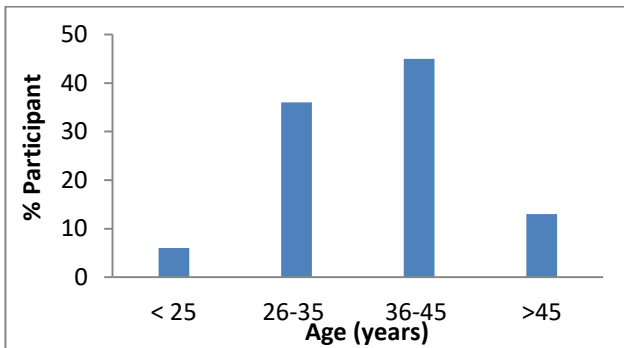


Figure 3: Age group of Participants

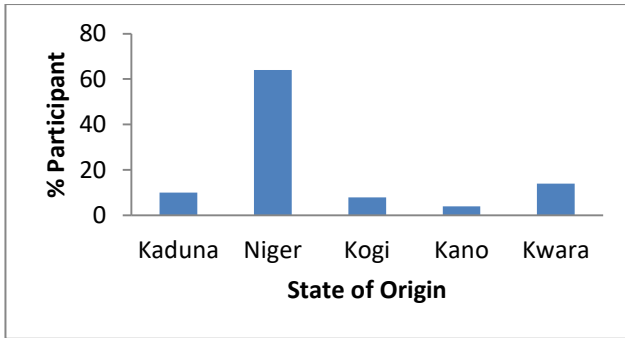


Figure 4: State of Origin of Participant

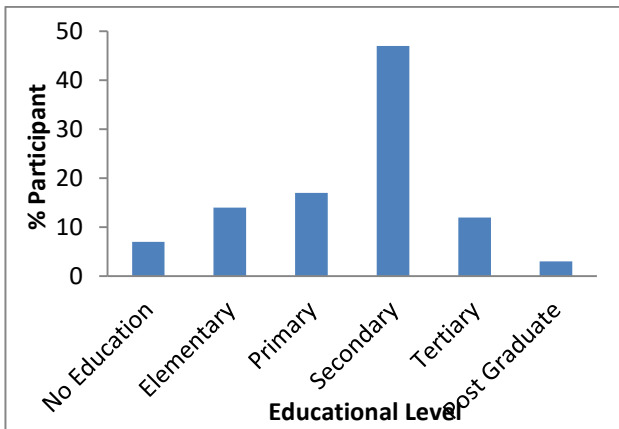


Figure 5: Educational Level of Participants

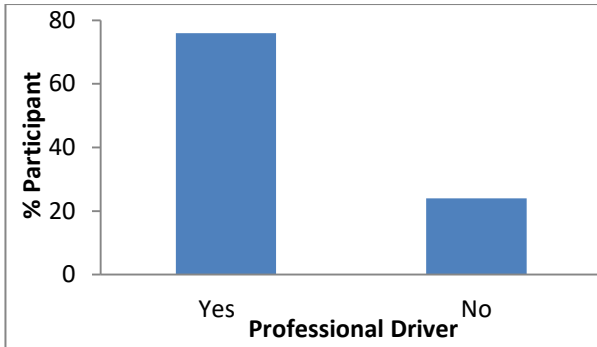


Figure 6: Professionalism of Driver

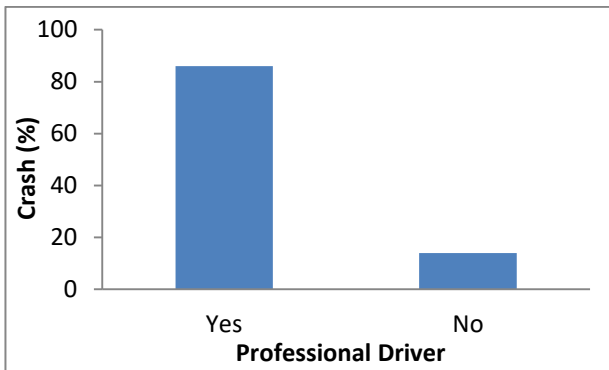


Figure 7: Professional and Non-Professional Driver Crash

The Table 4.1 shows the results of Minna drivers` attitudes toward seatbelts. Concerning participants` responses to the request to choose the three most important reasons why Minna drivers used seatbelts, a total of 300 possible counts was done; 39% drivers says they use seat belt to be safe on the road, 29 drivers says they use seat belt to avoid been penalized by Road Safety officials, 19% drivers says they are used while 9% drivers says “my family ask me to”, and 5% drivers chose other reasons. This means that the three most important reasons why Minna drivers were seatbelts are to be safe, to avoid penalty and already have the habit respectively in order of importance.

Also, concerning participants` responses to the request to choose the three most important reasons why Minna drivers do not wear seatbelts (a total of 300 possible counts); 42% drivers chose “too much trouble”, 31% drivers chose “uncomfortable”, 15% drivers chose “only travelling short distances”, 6% drivers chose “not needed at low speed” and 6% drivers chose “other reasons”. This simply means that the three most important reasons why Minna drivers do not wear seatbelts are too much trouble, uncomfortable and only travelling short distances respectively in order of importance.

Finally, concerning participants` responses to the request to choose the three best interventions to increase seatbelt usage in Minna, a total of 300 possible counts was used; 39% drivers chose “ radio and television advertisement”, 29% drivers chose “law enforcement improvement”, 19% drivers chose “increase penalty”, 8% drivers chose “improve seatbelt warning signals inside car”, and 5% drivers chose “others”. The above simply means that the three best interventions to increase seatbelt use in Minna are radio and television advertisement, law enforcement improvement, and increase penalty respectively in order of importance.

Table 4.1: Minna drivers` attitudes toward seatbelt usage

Participants` responses to the request to choose the three most important reasons why Minna drivers wear seatbelts (a total of 300 possible counts)	Safe 39.0% (n=117) Avoid penalty 29.0% (n=87) Already have the habit 19.0% (n=57) My family ask me to 8.0% (n=24) Other reasons 5.0% (n=15)
Participants` responses to the request to choose the three most important reasons why Minna drivers do not wear seatbelts (a total of 300 possible counts)	Too much trouble 42.0% (n=126) Uncomfortable 31.0% (n=93) Only travelling 15.0% (n=45) Short distances Not needed at low speed 6.0% (n=18) Other reasons 6.0% (n=18)
Participants` responses to the request to choose the three best interventions to increase seatbelt use rate in Minna.	radio and television advertisement 39.0% (n=117) Law enforcement improvement 29.0% (n=87)
Increase penalty 19.0% (n=57) Inside car 8.0% (n=24) Improve seatbelt warning signals	Others 5.0% (n=15)

In general, the used rates for the five study settlements (from large to small in population) were 32.0% in Tunga, 24.0% in Bosso, 30.0% in Gidan kwano, 32.0% in Mobil and 24.0% in Tundun Fulani. These numbers were

consistently within the range, 7 - 65%, illustrated by prior studies (Fleiter et al., 2022). The results of the study provide some insights into Minna drivers' attitude toward seatbelt usage and suggested best interventions for increasing their use. Drivers reported the number one reason why they wear seatbelts was because they are safer when they use their seat belt, although this reason was chosen by slightly more than third of the drivers (39.0%). This indicates that efforts are needed in increasing drivers' understanding on how important it is to wear seatbelts. This was tied/linked to the number one best intervention chosen by participants, which is the use of radio and television advertisement.

General public education on the importance of wearing seatbelt may be the most pressing need for improving seatbelt usage in Minna. This may have an impact not only for the drivers, but also for all the passengers, including children. Increasing awareness and improving people's attitudes and perceptions toward seatbelt use in Minna is critical to safe life.

As anticipated, this study results showed that when Minna drivers have better attitudes toward the importance of seatbelts, they are more likely to wear seatbelts and have fewer traffic violations and car crashes. The relationships between safety attitudes, safety behaviours, and safety outcomes are consistent with prior published research. For example, according to the Theory of Planned Behaviour (Ajzen., 2000, 2022),

4.0 Conclusion

This research employed multiple data collection methods (i.e., semi-structured interviews, observation, in-person surveys) to explore seatbelt usage in five settlements in Minna. This study showed the probability of an extremely low use of seatbelts for drivers in Minna, corresponding with what was anticipated and provides insight into the attitudes of Minna drivers on seatbelt usage and potential interventions. The study also showed that when seatbelt are used while driving and there is fatality the driver that use seatbelt is 86% safer than the driver who does not use the seatbelt will only be 37% safe should there be any accident.

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