Influence of Traffic Congestion on Psychological Stress and Pro-Social Behaviour among Commuters in Port-Harcourt Metropolis

By

Gladys Chidinma Oweisana
Educational Psychology, Guidance and Counseling, Federal College of Education (Tech.), Omoku, P.M.B 11Rivers State.
oweisanapearl@gmail.com
08032671491

And

Dr. Victor Ndubuisi Ordua
Educational Psychology, Guidance and Counseling, Federal College of Education (Tech.), Omoku, P.M.B 11Rivers State.
victorodua4@gmail.com
08037028024

Abstract

This study investigated Influence of Traffic Congestion on Psychological Stress and Pro-Social Behaviour among Commuters in Port-Harcourt Metropolis. The study adopted a descriptive-correlational research design and was guided by five research questions and four hypotheses which were tested at 0.05 level of significance. The study comprised of selected routes and fly-overs in Port Harcourt where high traffic congestion is encountered regularly. The selection of five (5) fly-overs; Rumuokoro, Waterline, Choba, Garrison and Rumuadaolu; and twenty (20) respondents were done randomly, in each of the areas making a total of 100 respondents. The researchers developed a self-reported questionnaire titled "Influence of Traffic Congestion on Psychological Stress and Pro-Social Behaviour (ITCPSPB)", to gather data from commuters. The simple percentage descriptive statistics was used to answer research question one and Pearson Product Moment correlation statistics was used for data analysis using the SPSS 22 version, to answer question two to five. Results revealed that commuters experience significantly high traffic congestion in Port Harcourt metropolis. Findings from the study further revealed a significant relationship between components of psychological stress (frustration, fatigue, and anger outburst), pro-social driving behaviour and traffic congestion among commuters in Port Harcourt Metropolis. Based on these findings, it was recommended that proper orientation and re-orientation programme for road users on effective utilization of the road should be organized regularly by relevant agencies, markets, malls, and shops should be cited few kilometers away from busy roads and junctions to reduce illegal parking and pedestrian movement. Policy

makers should initiate the provision of well-equipped quick traffic response unit to deal with frequent vehicle breakdowns on the road to allow easy flow of traffic always.

Keyword: Traffic Congestion, Psychological Stress, Pro-Social Behaviour, Commuters

Introduction

There has been an increased demand for transportation in recent times, particularly road transportation; as this is a crucial aspect of human civilization because it reflects the economic level and technological advancement of a given society. This rapid growth in road transport is not without its benefits and disadvantages. The benefits include not only easy movement of goods and services, but also, the indirect influence in terms of psychological stress that commuters experience due to various levels of traffic congestion.

The 2017 record of the National Bureau of Statistics (NBS) estimated the vehicle population in Nigeria amounted to 11,458,370 as at the first quarter of the year with 58.8% being commercial vehicles, while 44.5% of the total vehicle are private vehicles and the government and diplomatic vehicles contributed to respective figures of 1.65% and 0.1% of the total vehicle population (Iloani, 2017); Goddard (1997) in Onyeneke, (2018), observed an ever-increasing importation of used cars. Currently there are so many registered cars in Nigeria, with poorly planned roads and building, reckless driving and motor cycling and an ever-growing population in urban areas in Nigeria due to rural-urban migration; all these overstretch the available road facilities.

Port Harcourt which is one of the major cities and a state capital in Nigeria is not exempted from the challenge of traffic congestion, due to inadequate road facilities. Comparing the vehicle population in Nigeria over the years has led to traffic congestion in various cities including Port Harcourt. This traffic congestion occurs as result of too many people working in the capital city areas, coupled with narrow streets and shortage of off-street parking facilities, road trading, and bad roads amongst others. This makes on-street parking inevitable and reduces road design capacity resulting in traffic congestion. Otto and Simeon (2022) evinced that the causes were; illegal trading around the intersection, road user behavior, lack of pedestrian crossing facilities, absence of pavement markings, and lack of packing facilities.

There are broadly two factors, which effect congestion; (a) micro-level factors (b) macro-level factors that relate to overall demand for road use. Congestion is ‘triggered’ at the ‘micro’ level and ‘driven’ at the ‘macro’ level. The micro level factors are, for example, many people want to move at the same time, too many vehicles for limited road space. On the other side,

macro level factors are land-use patterns, which include car ownership trends, regional economic dynamics, among others (Rao & Rao, 2012).

The recent rise in road commuters has greatly resulted in various levels of road traffic congestion in major cities in the world and also in Nigeria. Traffic congestion has become a serious global menace that plagues commuters both in industrialized and developing nations (Babalik, 2013). It is an unavoidable situation that occurs as a result of growing metropolitan cities and rapid urbanization (Weiss, 2018). Some Nigerian cities are faced with series of traffic congestions; this indisputable issue is occasioned by the growing population concentration, rapid urbanization, and increasing commercial and economic activities. High population generates heavy vehicular traffic, leading to vehicular conflict and congestion as well as other mobility related challenges, which adversely affect the ultimate goal of people's mobility. Major cities in Nigeria, like Port Harcourt, face extreme traffic congestion where cars travel at speeds of about 3-5km/hr (Onyeneke, 2018). On most of the busy days of the week such as the workdays and during rush hours like the morning and evening hours, there exist extremely traffic congestions.

Dingle (2008) described congestion as an overcrowded condition or too much gathering of people or other things at a particular place. Traffic congestion therefore has to do with too much gathering of people and other things around the road network. Traffic congestion is a situation or condition on roads that are characterized by reduction in traffic speed, longer trip times, increased vehicular queuing because there is too much traffic on the road, and increased fuel consumption (Singh & Reddy, 2021). Traffic Congestion describes a situation when traffic flow is moving at speeds below the designed capacity of a roadway. Traffic Congestion also describes a state of traffic flow on a transportation facility characterized by high densities and low speeds, relative to some chosen reference state (with low densities and high speeds) (Bovy & Salomon, 2002). Traffic congestion is a condition of traffic delay (when the flow of traffic is slowed below reasonable speeds) because the number of vehicles and other significant road users trying to use the road exceeds the traffic network capacity to handle those (Weisbrod, 2001). From the above descriptions, Traffic congestion is characterized by a situation where travel time is delayed in excess of what is normally incurred under light or free-flow travel conditions.

Traffic on road consists of pedestrians, ridden or herded animals, vehicles, streetcars, buses and other conveyances, either singly or together, while using the public way for purposes of travel (Isla, 2016). Traffic Congestion occurs when there is an imbalance between transport demand and supply at a specific point in time and in a specific section of the transport system. It implies that the available transport infrastructure at that given time is being overstretched. Traffic congestion can be perceived as an unavoidable consequence of the usage of scarce transport resources, particularly if they are not priced. Traffic congestion wastes time, energy and causes pollution. It results in increase in fuel consumption, cost of traveling, and it adversely influences the quality of life and economic productivity in metropolitan cities. Apart from these, there are

adverse effects on psychological and mental health of commuters also. Loud honking, road rage, over speeding, long waiting periods in traffic can affect a person and other commuters as well.

Stress is a feeling of emotional or physical tension and it is the body's response to a challenge or demand. The term "stress" refers to the reaction of an organism to a perceived threat (stressor). Kenneth (1997), describes stress as a psychological and physiological reactions to a situation perceived as exceeding our coping resources. Bhowmik (2014) describes stress as a biological term which refers to the consequences of the failure of a human or animal body to respond appropriately to emotional or physical threats to the organism, whether actual or imagined. It includes a state of alarm and adrenaline production, short-term resistance as a coping mechanism, and exhaustion. Stress may be understood as a state of tension experienced by individuals facing extraordinary demands, constraints or opportunities. When demand overstretches bodily resources to meet the demand, then stress is created. While no definition of stress has been universally accepted, three common components are evident and universally accepted as making up the components of stress. These are stress triggers (stressor), cognitive appraisal of stressors and body reaction to the interpreted information. Traffic congestion serves as a major stressor to commuters. Stress due to traffic congestion can lead to different negative emotional and psychological consequences.

Commuters' psychological stress describes a feeling of emotional strain or tension that a commuter experience during commuting. It is defined as the body's response to the demand and challenges posed by the commuting process (Singh & Reddy, 2021). Studies have consistently associated traffic noise and congestion to varied levels of psychological stress development. Hennessy and Wiesenthal (1997) evinced that commuters held in high traffic congestion experience elevated stress levels. This leads to disturbed mood, fatigue, frustration, anxiety, sadness and anger outburst. Traffic congestion results in time and energy wastage, increases pollution and stress, decreases productivity and imposes costs on commuters in the society (Hjorteberg, Anderson & Ketzel, 2016).

One of the biggest consequences of traffic congestion is psychological stress. This refers to stress encountered in traffic situations. It describes a feeling of emotional or physical tension that is elicited during transportation and it is the body's response to challenges or demands posed by the commuting environment (Venkatesh & Pushpa, 2014). People experiencing high traffic congestion report elevated stress levels (Singh & Reddy, 2021). Awosusi and Akindutire (2010) found that traffic congestion is stressful and frustrating for drivers, commuters, and pedestrians because it leads to gridlocks, distorts incentives, and causes pollution. This association also seems to be more prevalent for people who drive in the traffic conditions, drivers (bus drivers) and non-drivers (bus conductor) in the same environment both showed a high level of stress in highly congested conditions but the level of stress was higher for drivers than non-drivers (Venkatesh & Pushpa, 2014). From the study of Singh and Reddy (2021) on the Relationship between Perceived Traffic Congestion, Commute Stress and Aggressive Driving in College

Students, adopting a descriptive survey design, 64 college students (M=27, F=37) were randomly selected for the study. Three instruments (Perceived Traffic Congestion Scale, Driving Behavior Inventory and Aggressive Driving Behavior Questionnaire) were used in this study. Pearson correlation was used to analyze the relationship between Perceived Traffic congestion, Commute Stress and Aggressive Driving. Results reveals that there is a positive correlation between traffic congestion and commute stress ($r = .146$, $p > .05$ and .01). A study by Popoola, Abiola and Adeniji (2013) on Traffic Congestion in Highways in Nigeria Causes, Effects and Remedies, a descriptive survey was adopted. 300 respondents were randomly selected. Spearman rank statistics was used to analyze the data. Results shows that Stress n^1=158, n^2= 94, n^3= 19, n^4= 6, N= 277, and Relative Importance Index (R.I.I.) = 0.864621)ranked third among the effects of traffic congestion.

Traffic congestion increases commuters psychological stress which; and this usually results in different negative behavioural pattern encountered in congested traffic situations. Anger, frustration, fatigue, aggression, irritability usually displayed in traffic situation can be understood as byproducts of psychological stress due to traffic congestion. It is observed during heavy traffic congestion; people often act out of stress and frustration. This mounting stress and frustration, results in a high tendency of an individual to engage in aggressive driving. It has been shown that people who experiencing high level of traffic congestion report a high level of psychological stress than people who experience a low level of traffic congestion (Hennesy & Wiesenthal, in Singh & Reddy, 2021). Driving in and experiencing a high level of traffic-congested conditions can lead to elevated annoyance and inconvenience leading to a low level of satisfaction with a commute that might result in aggression.

Onyeneke (2018), found that drivers in high traffic congestion conditions have been found to exhibit elevated levels of driver stress, including frustration, irritation, and negative mood. Psychological and physiological health is adversely affected by congested traffic conditions, resulting in negative outcomes, as well as increased arousal, heart rate, and blood pressure (Akinola & Mendes, 2014). Other potentially dangerous effects of psychological stress due to traffic congestion that have been identified are increased aggressive driving, poor concentration levels and increased accident occurrences (Akinola & Mendes, 2014; Singh & Reddy, 2021; Onyeneke, 2018). Stress experienced due to traffic congestion has been found to subsequently influence mood, thoughts, feelings, and behaviours in non-driving situations, such as work (Onyeneke, 2018). Babalola (2021), in a study on the Effect of Traffic Congestion on Commuter's Psychology in Lagos, Nigeria, using a descriptive survey design, twenty (20) commuters in each bus-stop from five (5) bus-stops (Oshodi, Ojota, Ojuelegba, Mile 2 and Obalende), found the effect of traffic congestion on respondents' mood, 34.7% of respondents confirmed that traffic congestion increase their anxiety, while 27.7% of the respondents' attached their restlessness to traffic congestion, 19.8% of the respondents' attributed depression to traffic congestion and 16.8% of the respondents' agreed that traffic congestion caused them anger. Results further revealed the effect of traffic congestion on respondents' behaviour, 50.5%

resulted into angry outbursts a major cause of violence in traffic and transportation. 18.8% agreed that traffic congestion stress resulted into drug or alcohol abuse, 18.8% for social withdrawal while 10.9% tobacco use. From the study of Singh and Reddy (2021) on the Relationship between Perceived Traffic Congestion, Commute Stress and Aggressive Driving in College Students, adopting a descriptive survey design, 64 college students (M=27, F=37) were randomly selected for the study. Three instruments (Perceived Traffic Congestion Scale, Driving Behavior Inventory and Aggressive Driving Behavior Questionnaire) were used in this study. Pearson correlation was used to analyze the relationship between Perceived Traffic congestion, Commute Stress and Aggressive Driving. The results indicate that there is a significant positive correlation between commute stress ($r = .676$, $p < .01$) and perceived traffic congestion.

Traffic congestion may influence pro-social behavior; Pro-social behaviour is a social behaviour that benefits other people or society as whole such as helping, obeying rules and regulations, sharing, donating, co-operating and volunteering among others (Elsenberg, Fabes & Spinard, 2007). These actions might be motivated by empathy and concern about the welfare and right of others as well as egoistic or practical concerns, such as one's social status, hope for direct/indirect reciprocity or adherence to one's perceived system of fairness (Baumeister, 2007; Sanstock, 2007). Pro-social behaviour may range from small favours to great deeds. It may take merely a moment, or it may be a long-term endeavor. It may be done without much conscious thought or weighing up the pros and cons. It may be under the control of situational forces or may express the personality of the donor (Bierhoff, 2002). Pro-social behaviours in traffic might include, helping to control traffic, helping pedestrians to cross roads, giving out alms to beggars among others. Helping refers to actions intended to improve the situation of the help-recipient. Pro-social behaviour may have costs as well as benefits. For example, allowing someone to cross the road or another vehicle to step into a space ahead of you delays you and others behind you.

Major on such behaviours is pro-social driving. Harris, Houston, Vazquez and Smither, (2014), describe pro-social as a manifestation of safe driving behaviours in various situations. Pro-socio driving behaviours refer to a pattern of safe driving behaviours that potentially protect the driver and other road users and help create a safe driving environment (Harris et al., 2014). The main goal is to identify effective ways to reduce accidents and promote driving safety. For example, drivers with patient and careful driving styles tend to drive safely and are less likely to be involved in accidents (Poó et al., 2013; Taubman-Ben-Ari et al., 2004). Specifically, safe driving behaviours are more related to specific and comprehensive behaviours than to the purposes (positive driving behaviours), behavioural habits (safe driving styles), consciousness (safe perceptions) or attitudes in relation to driving. In order to understand the extent of relationship between traffic congestion and psychological stress among commuters, it is expedient to investigation influence of traffic congestion on psychological stress and pro-social behaviour among commuters in Port-Harcourt metropolis.

Statement of the Problem

Traffic congestion, one of the acclaimed indicators of a city socio-economic vibrancy, may have likely challenges on the health of individuals especially users. The investigation of the background of the causes and effects of traffic congestions in Nigeria revealed huge existence of the negative effects of the scenario. Traffic congestion in Nigeria is also likely to be caused by poor conditioned roads that cannot contain the vehicle population, ongoing road constructions that usually take long, population and economic growth hence increased purchasing power and demand for vehicles and stubborn drivers that do not follow road rules and regulations which need to be investigated. Traffic congestion leads to increased pollution of the air with fumes from cars, increased travel times leading to delays hence loss of investment opportunities. It could also bring about increased pedestrian risks and road accidents.

Port Harcourt as one of the country's state capital is jam-packed with commercials, offices, retails, and cultural centres; and it is the centre point for transportation in Rivers State. Traffic congestion in Port Harcourt has been a constant problem for the sustainability of transportation development (Otto & Ogboda, 2022). All of the above could contribute to stress of commuters, leading to various kinds of health hazards like psychological disorders including aggressive behaviours, anger outburst, and high blood pressure, among others. Furthermore, traffic impedes social interactions and street activities. The need to understand how traffic congestion predicts the above health challenges is the focus of this study. Hence the statement of the problem is the "Influence of Traffic Congestion on Psychological Stress and Pro-Social Behaviour among Commuters in Port-Harcourt Metropolis".

Research Question

1. What is the level of traffic congestion in Port Harcourt Metropolis?

2. What is the extent of relationship between traffic congestion and the component of psychological stress (frustration) among automobile commuters in Port Harcourt Metropolis?

3. What is the extent of relationship between traffic congestion and the component of psychological stress (fatigue) among automobile commuters in Port Harcourt Metropolis?

4. What is the extent of relationship between traffic congestion and the component of psychological stress (anger outburst) among automobile commuters in Port Harcourt Metropolis?

5. Is there a relationship between traffic congestion and component of pro-social behaviour (pro-social driving) among automobile commuters in Port Harcourt Metropolis?

Hypotheses

1. There is no significant relationship between traffic congestion and frustration among automobile commuters in Port-Harcourt Metropolis.

2. There is no significant relationship between traffic congestion and fatigue among automobile commuters in Port- Harcourt Metropolis.

3. There is no significant relationship between traffic congestion and anger outburst among automobile commuters in Port- Harcourt Metropolis.

4. There is no significant relationship between traffic congestion and pro-social driving among automobile commuters in Port- Harcourt Metropolis.

Methodology

This study adopted a descriptive survey research design. The study was guided by four research questions and three hypotheses which were tested at 0.05 level of significance. The study comprised of selected routes and bus-fly-overs in Port Harcourt where high traffic congestion is encountered regularly. Port Harcourt is known for educational, industrial and commercial functions. The selection of five (5) bus fly-overs areas was done randomly, Rumuokoro, Waterline, Choba, Garrison and Rumuadaolu. These fly-overs areas are among the most traffic congested circuits in Port Harcourt. The study randomly selected twenty (20) respondents in each of the study area;and a researcher's developed questionnaire titled "Influence of Traffic Congestion on Psychological Stress and Pro-Social Behaviour (ITCPSPB)", were administered directly to commuters. The questions raised covered average hours spent on road commuting, basic psychological stress experienced in traffic congestion, pro-social behaviours experienced during traffic congestion. The simple percentage descriptive statistics was used to answer research question one and Pearson Product Moment correlation statistics was used for data analysis of questions two to five using the SPSS 22 version.

Data Presentation

Except research question one, all other four (4) research questions were hypothesized.

Research Question One: What is the level of traffic congestion in Port Harcourt Metropolis?

Table 1: Descriptive Analysis of level of traffic congestion in Port Harcourt Metropolis

Variables	Definition	Analysis	Result	Remark
Average Time Spent in traffic	$\frac{x}{N} x \frac{100}{1}$	$\frac{2}{12} x \frac{100}{1}$	16.67 %	High

	x=average hour spent N=total hours of daytime 100=constant			
Average Number of vehicles per hour	$\frac{2}{12} x \frac{100}{1}$ a=Average number of vehicles that passed per hour b= Expected number of vehicles within an hour 100=constant	$\frac{150}{1000} x \frac{100}{1}$	15%	High

From the above data, it was discovered that average time is 16.67%, and average number of vehicles per hour is 15%. Where it is expected that 1000 vehicles should pass through, only 150 vehicles are passing through, this shows great traffic congestion. These figures are far less than half of the time. This signifies that there is a high rate of traffic congestion, hence the reduction.

Research Question 2: What is the extent of relationship between traffic congestion and the component of psychological stress (frustration) among automobile commuters in Port Harcourt Metropolis?

Hypothesis One: There is no significant relationship between traffic congestion and frustration among automobile commuters in Port Harcourt Metropolis

Table 2: Pearson Product Moment Statistics of Relationship between Psychological Stress (frustration) and Traffic Congestion among Automobile Commuters

Variables	**N**	**Pearson (r)**	**Sig. (2-tailed)**
Psychological Stress (frustration) Traffic Congestion	100	.810	.000

*P≤ .05 Level of Significance

a. Dependent: Traffic Congestion

b. Predictor: Psychological Stress (frustration)

Table 2 presents the Pearson (r) correlation of the relationship between traffic congestion and psychological stress (frustration) among commuters in Port Harcourt metropolis. From the table, it shows that r =0.810, n=100, and p=< 0.000. From the result, it shows that the p-value is less than the alpha level of 0.05 level of significance. Therefore, it is statistically significant, this connotes that traffic congestion is a positive significant predictor of frustration experienced in traffic congestion. As such the null hypothesis which states that there is no significant

relationship between psychological stress and traffic congestion among automobile commuters is hereby rejected. This demonstrates that there is positive significant relationship between traffic congestion and frustration which is a component of psychological stress among automobile commuters.

Research Question 3: What is the extent of relationship between traffic congestion and the component of psychological stress (fatigue) among automobile commuters in Port Harcourt Metropolis?

Hypothesis Two: There is no significant relationship between fatigue traffic congestion among automobile commuters in Port Harcourt Metropolis.

Table 3: Pearson Product Moment Statistics of Relationship between component Psychological stress (fatigue)and Traffic Congestion among Automobile Commuters

Variables	**N**	**Pearson (r)**	**Sig. (2-tailed)**
Psychological stress (fatigue) Traffic Congestion	100	.625	.000

*P≤ .05 Level of Significance

a. Dependent: Traffic Congestion

b. Predictor: Psychological stress (fatigue)

Data in table 3 shows the Pearson (r)=0.625, n =100, and p=< 0.000. From the result, it is observed that the p-value is less than the alpha level of 0.05 level of significance. This reveals that traffic congestion is a good predictor of fatigue. Therefore, there is a statistically significant relationship between the component of psychological stress (fatigue) and traffic congestion. As such, the null hypothesis which states that there is no significant relationship between fatigue and traffic congestion among automobile commuters in Port Harcourt Metropolis, is hereby rejected. This demonstrates that there is a positive significant relationship between traffic congestion and component of psychological stress (fatigue) among automobile commuters.

Research Question 4: What is the extent of relationship between traffic congestion and component of psychological stress (anger outburst) among automobile commuters in Port Harcourt Metropolis?

Hypothesis Three: There is no significant relationship between traffic congestion and anger outburst among automobile commuters in Port- Harcourt Metropolis.

Table 4: Pearson Product Moment Statistics of Relationship between component Psychological stress (anger outburst) and Traffic Congestion among Automobile Commuters

Variables	**N**	**Pearson (r)**	**Sig. (2-tailed)**
Psychological stress (anger outburst) Traffic Congestion	100	.756	.000

*P≤ .05 Level of Significance
a. Dependent: Traffic Congestion
b. Predictor: Psychological stress (anger outburst)

Table 4 presents the Pearson (r) correlation of the relationship between traffic congestion and psychological stress (anger outburst) among commuters in Port Harcourt metropolis. From the table, it shows that r =.756, n=100, and p= < 0.000. The result indicates that the p-value is less than the alpha level of 0.05 level of significance. Therefore, it is statistically significant, this connotes that traffic congestion is a significant predictor of anger outburst experienced in traffic congestion. As such the null hypothesis which states that there is no significant relationship between anger outburst and traffic congestion among automobile commuters is hereby rejected. This demonstrates that there is positive significant relationship between traffic congestion and anger outburst which is a component of psychological stress among automobile commuters.

Research Question 5: Is there a relationship between traffic congestion and component of pro-social behaviour (pro-social driving) among automobile commuters in Port Harcourt Metropolis?

Hypothesis four: There is no significant relationship between pro-social driving and traffic congestion among automobile commuters.

Table 5: Pearson Product Moment Statistics of Relationship Between component Pro-Socio Behaviour (pro-social driving) and Traffic Congestion Among Automobile Commuters

Variables	**N**	**Pearson (r)**	**Sig. (2-tailed)**
Pro-Socio Behaviour (pro-social driving) Traffic Congestion	100	.596	.001

*P≤ .05 Level of Significance
a. Dependent: Traffic Congestion
b. Independent: Pro-Socio Behaviour(pro-social driving)

In table 4, Pearson (r) analysis of the relationship between pro-socio behavior (pro-social driving) and traffic congestion among automobile commuters; reveal a Pearson (r) = .596, n=100, and p< 0.001. From the result, the p-value is less than the alpha level of 0.05 level of significance. This reveals that traffic congestion predicts pro-socio driving which is a component of pro-social behaviour. As such, the null hypothesis that states that there is no significant relationship between pro-socio driving and traffic congestion among automobile commuters is hereby rejected. This implies that there is a significant relationship between pro-socio behavior (pro-social driving) and traffic congestion among automobile commuters in Port Harcourt Metropolis.

Discussion of Findings

The result of findings from research question one revealed that traffic congestion in Port Harcourt Metropolis is significantly high. This result relates with a study by Onyeneke, (2018) who found that traffic congestion is usually high in major metropolitan cities in Nigeria, including Port-Harcourt. Onyeneke (2018) noted that people in Port Harcourt experience high traffic congestion where cars travel at speeds of about 3-5km/hr. whereas, a distance of 3-5km was not supposed to be more than 30 minute drive, but it takes up to one (1) hour or more this is an indication of high traffic congestion.

Analysis of data to answer research question two, establish a positive significant relationship between traffic congestion and the component of psychological stress (frustration) among automobile commuters in Port Harcourt Metropolis. This indicates that automobile commuters experience some level of frustration when their commuting process seemed delayed due to traffic congestion. The reason for this finding is the fact that when individuals has time schedules to meet, only to meet gridlocks as a result of traffic congestion occasioned by too many vehicles, bad roads, disobedience to traffic rules and regulations, overstretched facilities, indiscriminate parking among others, the individual would experience and display some levels of frustration. The above finding supports the study of Singh and Reddy, (2021) and Awosusi and Akindutire (2010) whom acknowledged that People experiencing high traffic congestion report elevated levels of frustration and mood change.

The data analyzed to answer research question three, indicated that a positive significant relationship between traffic congestion and the component of psychological stress (fatigue) among automobile commuters in Port Harcourt Metropolis. This finding demonstrates that commuters in any level of traffic congestion experience various degree of fatigue; this is because noise from honking of vehicles, inhalation of smoke from other vehicles, heat and sweating resulting from poor air circulation (especially in vehicles without air conditions) can increase tiredness and fatigue in road commuters. This finding commemorates the findings of Gyulyev, Prasolenko and Zinchenko (2019), when they found in a “study of the influence of road congestion on the fatigue level of a sanguine driver”, the longer these drivers spent in the road congestion the higher their fatigue levels.

The data analyzed to answer research question four, shows a positive significant relationship between traffic congestion and component of psychological stress (anger outburst) among automobile commuters in Port Harcourt Metropolis. The reason for this finding is because the tendency for anger outburst, aggressiveness, when people experience traffic congestion, especially when the congestion is due to disobedience of traffic rules. This finding commemorates the findings of Onyeneke, (2018), Babalola (2021), and Singh and Reddy (2021) who found that psychological stress experienced by commuters held in traffic include the display of; frustration, irritation, anger outburst, and negative mood.

Findings from the data analysis obtained from participants to answer research question five indicated that there is a positive significant relationship between pro-socio driving behaviour and traffic congestion among automobile commuters in Port Harcourt Metropolis. This demonstrates that traffic congestion has significant influence on pro-socio driving behaviour. The reason for this finding is that no one wants to be involved in an accident or physical fights that could result in injuries. Although, traffic situations will make one get frustrated, angry, and agitated, individuals still try to avoid mal-adjusted behaviours with a bid to get home without hurt. This is in line with the findings from the study of Harris, Vazquez, Smither and Harms (2014) who found traffic congestion help road users to create a safe driving environment. Pro-socio driving behaviours refer to a pattern of safe driving behaviours that potentially protect the driver and other road users and help create a safe driving environment.

Conclusion

Transportation is a crucial aspect of human civilization as it reflects the economic level and technological advancement of a given society. The recent rise in road commuters has greatly resulted in various levels of road traffic congestion in major cities in the world including Nigeria. Traffic congestion has become a serious global menace that plagues commuters both in industrialized and developing nations. It is an unavoidable situation that occurs as a result of growing metropolitan cities and rapid urbanization. Traffic congestion is a situation that affects millions of people all over the world. It can have psychological as well as physical consequences which have been reported by previous studies. The current study establishes relationship between traffic congestion, components of psychological stress (frustration, fatigue and anger outburst), and pro-social driving behaviour among automobile commuters in Port Harcourt Metropolis. The study provides relevant data for future study directions as it is one of the studies on automobile commuters' experience of traffic congestion.

Recommendations

Based on the findings from this study, the following recommendations are hereby made:

1. There should be consistent and appropriate orientation and re-orientation programme by governmental road agencies for road users on effective utilization of the road.

2. The government agencies should endeavor to cite markets and malls/shops few kilometres away from the busy roads and junctions to reduce pedestrian and illegal parking.
3. Pedestrian bridges should be constructed across areas of high vehicular movement; this will help reduce the rate of traffic congestion due to pedestrian obstruction.
4. Policy makers and road transport management system should initiate the provision of well-equipped quick traffic response unit to deal with frequent vehicle breakdowns on the road.

5. Proper road maintenance policy should be implemented to respond promptly to road repairs as the need arises.
6. Functional traffic lights should be installed on the roads and adherence to obedience to traffic rules should be enforced by appropriate agencies.

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