Analysis of Covid 19 Pandemic on the Travel Behavior of Commuters in Igboora

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DOI: 10.56201/ijssmr.v10.no3.2024.pg262.272

Abstract
The study viewed at global Coronavirus (COVID-19) pandemic as is taking an excessive sway on all areas of the normal life of individuals worldwide as well as their travel behavior. Nations have been effected various methods that focus on checking social contacts and reducing in this way the spread of the virus and its swift blowout transversely throughout the world necessitated the introduction of travel restriction policies by the federal and state governments of Nigeria. It was done to abridge the stretch out of the noxious diseases.This paper sought to examine the travel behaviour of scorning travellers in Igboora,oyo state Nigeria amidst the travel restriction policy during the lock down. About 400 questionnaires were administered to commuters travelling within the 440 square kilometers of igboora in Oyo State. The study was Analysed using descriptive statistics and chisquare test for independence between the categorical data made available for this study. The findings of the study displayed that there was significant variation in travel behavior of commuters in Igboora, Oyo State at 0.05% level of significance using contingency tables. Also, there was statistically significant level of depence of commuters' socio-demographic characteristics on modal split and trip destination.

Keywords: *Covid-19 Pandemic, Commuter, Travel Behaviour, Lockdown*

Introduction

The need to study man characteristics or manner of interaction which beghast peoples' travel behaviour is owing to its complementary with the performance of transport systems and policy interventions (Chinazzi et al., 2020; Mogaji, 2020). To plan and develop a better cities and systems with adequate facilities that can provide for the needs of urban inhabitants such as social intervention or for public health response actions call for the attention from stakeholders like town planners, transport engineers, economist, statistcian (Chinazzi et al., 2020).Travel behaviour is a function of travellers social demographic distinguishing features that is their education

background,age,family size, sexual characteristics, car ownership, marital status,etc.The advantages of travelling include education purposes, business purpose, recreation, health reasons and wealth creation and transport service providers also generate revenue to boost the economy, hence travelling is very important in an economic conscious environment (World Bank Group, 2020). The most forms of disadvantages or setback attached to travelling that are hurtful to people who regularly travels from one place to another are disease contraction, injury or fatal accidents and traffic volume generated on the highways (Ojo & Awokola, 2012). In most developing countries,public transport system in practice necessitate sharing of common space among passengers and this uphold sitting together within bordered spaces usually about 10 m^2 or less in buses or trains where travellers sit less than 0.5m apart, with person whose health condition are usually secretive in most cases. This is risky as the likeliness of disease outsending through contraction among passengers becomes increasing.Consequently, the planning and development of public transport system ask for the detailed analysis of commuters behavioural attributes and the most compassionate features that has power to affect travel behaviour in terms of modal split and trip destination or purpose include, travel time or distance, available mode and fare or attractiveness in terms of comfort and safety .

In spite of its diverse advantages, travelling uncover or exposes passengers to peril of different forms or hazards ranging from the effects of air pollutant emitted from automobile tail pipes distributed within the environment (Tipaldi et al., 2020). This study could not find previous studies on travel behaviour in the metropolitan cities of Igboora, Oyo state, and there has never been a policy of such on travel restriction for comparison and inferences.

It can be observed from the previous studies, Muhammad Ahsanul Habib et al (2021), Emmanuel Mogaji et al (2021) and Viktoriya Kolarova et al (2021) whose have worked on the relationship (Correlation), the trend and pattern of movement (Time series)as well as changes in travelling behavior of commuters in response to the pandemic (Anova) but not dwell much on the havoc rendered by the pandemic and psychological torture experienced by the commuters through lockdown and level of compliance of commuters to the travel restriction policy during the outbreak.It is on these afformentioned, this study sought to Analyse the effect of covid-19 pandemic on travel behaviour of commuters and level of compliance to travel restriction policy using chi-square Test Statistic.

Related works and Theories

Ja'afar A.A. Zankan et al (2021) examined the impact of Covid-19 on transportation and other livelihood sources that depend on transportation in Southern Kaduna State of Nigeria. The outcome shown that Covid-19 has led to the increase in the cost of transport, restriction on movement, loss of farm produce and reduction in road traffic crashes in Southern Kaduna.

Muhammad Abdullah (2020) worked on the changes that occurred in travel behavior due to the COVID-19 pandemic. He used online questionnaire survey and results explained that trip purpose, mode choice, distance traveled, and frequency of trips for the primary travel were significantly different before and during the pandemic.

Cahyanto et al. (2016) conducted an online survey to study the factors influencing the avoidance of domestic travels by Americans due to the confirmed Ebola virus cases. They concluded that perceived vulnerability, perceived risk, subjective knowledge, and self-efficacy affect the

avoidance of domestic travel significantly. Demographic characteristics, such as age and gender, were also found to have a significant relationship with travel avoidance.

Stigma The theoretical analysis in this study assumes that, under the declared state of emergency, the individual going out suffers psychological costs arising from both the stigma of going out and the risk of infection. That is, we emphasize that infection risk and stigma have a complementary effect on the psychological cost to the player. Thus, the theoretical result shows that under a declared state of emergency, people refrain more from going out as it entails a strong psychological cost.

Pathogen-stress theory

According to this theory, when people develop in a parasite-infested environment, they become less open to visitors, less curious, less exploratory and reduce their chance of infection. This theory is not only emphasized cultural differences but also cultural difference over space such as between different human populations. Generalizing the concept of pathogen- stress theory, this study explores the effect of Covid-19 epidemic and its impact on travel risk and management perceptions.

Methods

Research Design

The paper used descriptive cross sectional study design to analyze covid -19 pandemic on travel behaviour of commuters in igboora, oyo state, Nigeria.

Data source

This paper used primary source of data and also secondary source for the data.

Primary Data: The primary data for this study was collected through the use of questionnaire survey. The paper targeted these set of people for the study includes transport workers (drivers, road transport union workers and okada riders), petty traders at bus stop and fuel stations and farmers across the study area who had knowledge and negative feeling the Covid-19 lockdown has on their daily Activities.

Secondary Data: This was achieved through the use of text books, thesis, journals and internet materials, as well as publications which was used mainly for literature review.The method was relied upon in this research work.

Sample Size and Sampling Techniques

Sampling Technique

The research work carried out a field survey to obtain the primary data for the study. The study area has 7 local wards. To collect data for the study,all seven wards in Igboora areas were selected .Self-administered questionnaire to respondents was conducted throughout the study area using availability sampling procedure.

The population of the study is people from the 7 wards in Igboora. The sum total of the population is (135,772).

Sample size: The sample size shall be determined by the use of Taro Yamane 1967 formulae: n $= N/1 + Ne^2$

Where n = sample size, N = Population size under study e= level of significance, 1 = constant. The summation of population for the study shall be Z, and by substitution with level of significance of 0.05.

$n=N\div (1+N\ (e)^2$

$n = 135772 \div (1 + 135772(0.05)^2$
$n = 135772 \div (339.4\ 3)$
$n = 400$
Therefore, the sample size is 400.

Data Analysis Method

The study applied descriptive analysis and quantitative comparative analyses were used on the collected data. A nonparametric test was applied for inferential statistical analyses. Data collected was analyzed using SPSS version 21.0.The Descriptive statistical tool was used to figure out the percentage distribution of commuters' modal split and the distribution of trip purposes along with the theoretical hypotheses to be tested and the non-parametric i.e Chi-square was employed to scrutinize the dependence among the variables with special preference to the objective of the study while $p<0.05$ was considered statistically significant.

Result of Findings

In this section, the findings of this study were presented. These contain results of the survey conducted. The findings were organized into the following sections:

- Socio-demographic characteristics of the respondents'
- Participant characteristics and modal split
- Commuters socio-demographic characteristcs on travel behavoiur

Distribution of Participants and their Socio-demographic Information

Table 1: Socio-demographic Information of the Participants (N=400)

Characteristics	Frequency	(%)
Sex		
Male	225	56.3
Female	175	43.8
Age		
≤20	5	1.3
20-29	59	14.8
30-39	187	46.8
40-49	114	28.5
50-59	21	5.3
≥60	14	3.5
Marital Status		
Married	313	78.3
Single	33	8.3
Separated	48	12.0
Divorce	6	1.5
Education level		

No formal Education	21	5.3
Secondary	89	22.3
Tertiary	172	43.0
Primary	74	18.5
Others	44	11.0
Employment Status		
Student	25	6.3
Employment	124	31.0
Business	250	62.5
Others	1	0.3
Income		
Below ₦50,000	88	22.0
₦ 50,000-₦ 100,000	297	74.3
Above 100,000	15	3.8
Essential Worker		
Yes	103	25.8
No	297	74.3
Number of people living in a house		
1-3	135	33.8
4-6	205	51.3
7 above	60	15.0
Car Ownership		
Yes	101	25.3
No	299	74.8
Motorbik Ownership		
Yes	24	6.0
No	376	94.0

Table 2 revealed that modes with high rate of demand during the lock down was walking, followed by Okada and Taxi as responded by the respondents 204(51.0%), 119(29.8%) and 73 (18.3%) respectively while modes with low rate of demand by passengers during the lock down was Keke Napep, Private car and minibus at 1(0.3%), Minibus 1(0.3%) and 3(0.8%) respectively. Meanwhile movement was the main player responsible for the spread of covid 19 disease and some trip attraction point were totally lockdown, most commutter preffered walking as a micromobility

mode and to distance themselves from other persons for short distance travels (Moslim et al., 2020). Commuters within the age range 20 to 49 years constituted 91.4% of the sum of passengers that violated the stay at home rule more than the tennagers and the aged persons as it was revealed by the respondents . This was ascribed to the relatively involvement of active age group in social engagement (Zwerts et al., 2010)

The study revealed that male commuters embarked on trips used to Trek,okada and Taxi more often than thier female counterpart as indicated by the respondents 114.8%,66.9% and 17.3% respectively.

The married travellers board the available public transport modes, the walking, Okada and Taxi 53.7%, 31.9% and 13.4 while single passengers used walking, Okada, Taxi as a means of transportation 48.5%, 33.3% and 15.2% as it was shown by the respondents . This distribution was attibuted to desire to attend social activities,they went out to buy goods or services,religious centres, sporting event with the neighborhood. The household size with 7members and above did not embark on many trips as compared with family smaller size i.e 2-3 members,the mode commonly used by household included Okada, Walking and Taxi as well as private cars and keke Napep. This travel partern was attributed to essential need for short distance travel which does not require motorised system.

Table 2: Participants characteristics and modal split

Modal choice

Social Demography	**Classes**	**Modal split**					
		Taxi	**Walking**	**Okada**	**Minbus**	**Private car**	**Total**
Age in years	10-19	2(40.0%)	0(0.0%)	2(1.7%)	0(0.0%)	1 (20%)	5(100)
	20-29	13(22.0%)	28(47.5%)	18(30.5%)	0(0.0%)	0(0.0%)	59(100)
	30-39	24(12.8%)	111(59.4%)	50(26.7)	1(0.5)	1(0.5)	187(100)
	40-49	20(17.5%)	57(50.0%)	37(32.5%)	0(0.00%)	0(0.00%)	114(100)
	50-59	9(42.9%)	5(23.8%)	6(28.6%)	0(0.0%)	1(4.8%)	21(100)
	Above 60	5(35.7%)	3(21.4%)	6(42.9%)	0(0.0%)	0(0.0%)	14(100)
Gender	Male	39(17.3%)	120(114.8)	63(66.9%)	1(0.4%)	2(0.9%)	225(100)
	Female	34(19.4%)	84(48.0%)	56(32.0%)	0(0.0%)	1(0.6%)	175(100)
Level of Education	Primary	1(4.8%)	17(81.0%)	3(14.3%)	0(0.0%)	0(0.0%)	21(100)
	Secondary	15(16.9%)	37(4.6%)	36(40.4%)	1(1.1%)	0(0.0%)	89(100)
	Tertiary	35(20.3%)	67(39.0)	67(39.0)	0(0.0%)	3(1.7%)	172(100)
	No formal education	11(14.9%)	52(70.3%)	11(14.9%)	0(0.0%)	0(0.0%)	44(100)
Marital Status	Married	42(13.4%)	168(159.6%)	100(93.1%)	1(0.3%)	2(0.6%)	313(100)
	Single	11(33.3)	5(15.2%)	16(48.5%)	0(0.0%)	1(3.0%)	33(100)
	Separated	14(29.2)	31(64.6)	3(6.3)	0(0.0%)	0(0.0%)	48(100)
	Divorce	6(100)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	6(100)

Employment Status	Student	9(36.0)	5(20.0%)	11(44.0%)	0(0.0%)	0(0.0%)	25(100)
	Employed	21(16.9%)	53(42.7%)	48(38.7%)	0(0.0%)	2(1.6)	124(100)
	Business	43(17.2%)	146(58.4%)	59(23.6%)	1(0.4%)	1(0.4%)	250(100)
	Others	0(0.0%)	0(0.0%)	1(0.8%)	0(0.0%)	0(0.0%)	1(100)
Income	Below ₦50,000	23(26.1)	36(40.9%)	27(30.7)	0(0.0%)	2(2.3%)	88(100)
	₦50,000-₦100,000	45(15.2%)	167(56.2%)	83(27.9%)	1(0.3%)	1(0.3%)	297(100)
	Above ₦100,000	5(33.3%)	1(6.7%)	9(60.0%)	0(0.0%)	0(0.0%)	15(100)
Essential worker	Yes	12(11.7%)	79(76.7%)	11(10.7%)	0(0.0%)	1(0.0%)	103(100)
	No	61(20.6%)	125(42.1)	108(36.4%)	1(0.3%)	2(0.7)	292(100)
Number of people living in a house	1-3	19(14.1%)	66(48.9%)	49(36.3%)	0(0.0%)	1(0.2%)	135(100)
	4-6	30(14.6%)	107(52.2)	66(32.2)	1(0.5%)	1(0.5%)	205(100)
	7 and above	24(40.0%)	31(51.7%)	4(6.7%)	0(0.0%)	1(1.7%)	60(100)
Car Ownership	Yes	17(16.8)	65(64.4%)	17(16.8%)	0(0.0%)	2(2.0%)	101(100)
	No	56(18.7%)	139(46.5%)	102(34.1)	1(0.3%)	0(0.3%)	299(100)
Motor Bik	Yes	11(45.8%)	5(20.8%)	8(33.3%)	0(0.0%)	0(0.0%)	24(100)
	No	62(16.5)	199(52.9%)	111(29.5%)	1(0.3&)	3(0.8%)	376(100)

Hypothesis Testing

There is no statistical significant dependence of commuter ‘s social demographic characteristics on modal split and trip destination.

Table 3: Chi-Square Tests

	Value	Df	
Pearson Chi-Square	81.053(a)	2	.000
Likelihood Ratio	85.029	2	.000
Linear-by-Linear Association	63.158	1	.000
N of Valid Cases	400		

a 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.25.

In this study the corrected value is 81.05 with associated significance level of 0.000. In this case the value of 0.000 is *less* than the alpha value of 0.05, so we can conclude that our result is significant.

Decision

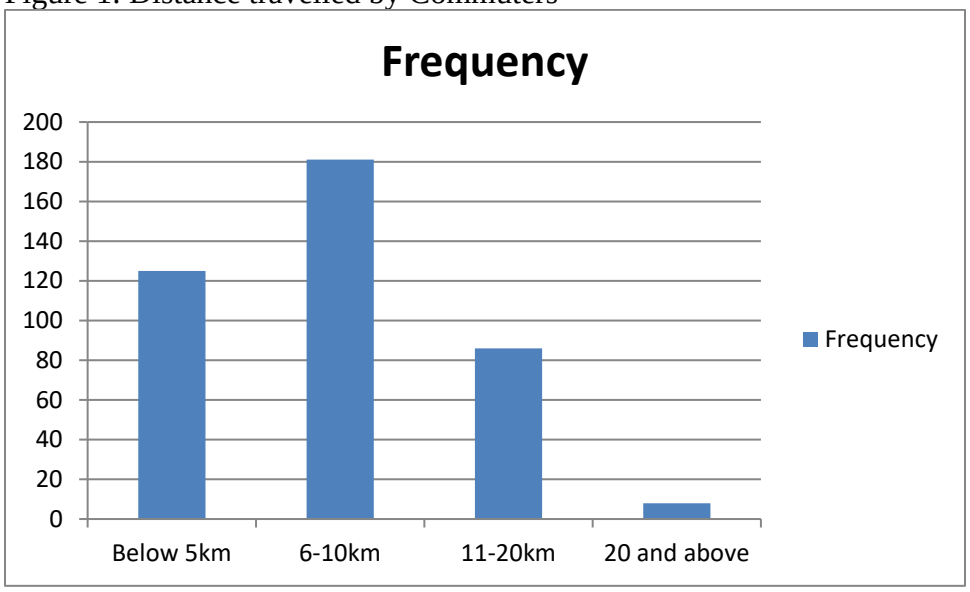
Since Asymp. Value which is 0.000 is less than p-value 0.05, the null hypotheses is rejected and alternative accepted, therefore the commuter's socio demographic characteristics is significant dependence on modal split at 5% level of significance. This trend showed that, there was influential change in travel behavior of travellers in Igboora, Oyo State during the lockdown.

Table 4 reveals that Office, Business and Shopping attracted relatively high trip as indicated by the respondents 30.5%, 45.0% and 20.5% compared to hospitals, schools and others 1.5%, 0.3% and 2.3% in accordance with respondents opinion.The rise in request for business and shopping was mainly for comsumable goods . Offices attract most of the core work forces that had permissions to travel within the Igboora. There was no the same percentage of trip distribution throughout the social demographic class,the factors that influenced the level of compliance with covid-19 regulation and guidance of travel behaviour of commuter was the demographic influence and information source for the pandemic as it was indicated by the respondents. Most married commuters traveled for business and Shopping, the travel patterns was associated to the fact that they need to satisfy their basic needs and also commercial purposes required them to go the groceries and other utility shops .

Table 4 Commuters socio-demographic characteristcs on travel behavoiur

Social Demography	Classes	Trip Distribution						
		Office	Business	Shopping	School	Hospital	Others	Total
Age in years	10-19	3(60.%)	0(0.0%)	1(10.7)	0(0.0%)	0(0.0%)	0(0.0%)	5(100)
	20-29	7(11.9%)	41(69.5%)	1(1,7%)	3(5.1%)	0(0.0%)	7(11.9%)	59(100)
	30-39	93(49.7%)	88(47.1%)	3(1.6%)	1(0.5%)	1(0.5%)	1(0.5%)	187(100)
	40-49	18(15.8)	69(60.5)	0(0.0%)	0(0.00%)	0(0.00%)	0(0.00%)	114(100)
	50-59	2(9/5%)	11(52.4%)	7(33.3)	0(0.0%)	0(0.0%)	1(4.8%)	21(100)
	Above 60	1(7.1%)	10(71.4%)	2(14.3%)	1(7.1%)	0(0.0%)	0(0.0%)	14(100)
Gender	Male	119(52.9)	86(38.2)	7(3.1%)	4(1.8%)	0(0.0%)	9(4.0%)	225(100)
	Female	3(1.7%)	94(53.7)	75(42.9)	2(1.1)	1(0.6%)	0(0.0%)	175(100)
Level of Education	Primary	1(4.8%)	19(90.5%)	1(4.8%)	0(0.0%)	0(0.0%)	0(0.0%)	21(100)
	Secondary	0(0.0%)	74(83.1%)	1(1.1%)	5(5.6%)	0(0.0%)	9(10.1%)	89(100)
	Tertiary	121(70.3)	32(18.6%)	17(9.9%)	1(0.6%)	1(0.6%)	0(0.0%)	172(100)
	No formal education	0(0.0%)	11(14.9%)	63(85.1%)	0(0.0%)	0(0.0%)	0(0.0%)	44(100)
Marital Status	Married	1(7.1%)	10(71.4%)	2(14.3%)	4(1.3%)	0(0.0%)	0(0.0%)	313(100)
	Single	2(6.1%)	18(54.5%)	1(3.0%)	2(6.1%)	1(3.0%)	9(27.3)	33(100)
	Separated	0(0.0%)	47(97.9%)	1(2.1%)	0(0.0%)	0(0.0%)	0(0.0%)	48(100)
	Divorce	0(0.0%)	5(83.3)	1(16.7%)	0(0.0%)	0(0.0%)	0(0.0%)	6(100)
Employment Status	Student	0(0.0%)	4(16.0%)	7(28.0%)	4(16.0%)	1(4.0%)	9(100)	25(100)
	Employed	41(33.1%)	70(56.5%)	12(9.7%)	1(0.8%)	0(0.0%)	0(0.0%)	124(100)
	Business	81(32.4)	105(42.0%)	63(25.2%)	1(0.4%)	0(0.0%)	0(0.0%)	250(100)
	Others	0(0.0%)	1(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	1(100)

Figure 1: Distance travelled by Commuters



mean = 1.94

Standard deviation = 0.778

N= 400

Figure 1 shows the estimated average travelled distance at 1.94km with standard deviation 0.778 which indicated high level of variance among trip lengths within the approximately area of 440 square kilometers of Igboora,oyo state. Other trip measuring between 11-20km and 20km and above had low and lowest frequencies as it was revealed by the figure above. This style of trip distribution was attached to the panic of contracting Covid-19 diseases by travellers thus avioding lengthy journey in an effort to abide the stay at home rule .

Summary of Findings and Conclusion

Results of the study showed the available modal choices in igboora, Oyo State include Walking, Okada, Taxi, Minibus, tricycle and Personal car. The common trip destination identified by the study included Open markets, Offices(bank) and Shopping centres.There was statistically significant level of depence of travellers socio-demographic attributes on modal split and trip destination. There was change in travel behavior of commuters in Igboora, Oyo State during pandemic.

Recommendations

Due to the outcome of this study, these recommendations were made;

i. Concerned establishments should put more sweats on sensitizing people about Covid-19 or outbreak of any pandemic and its deadly effect to instill fear in passengers and shun travelling during the lockdown period to avoid spreading.

ii. Law enforcement agents should be posted to the every nooks and crannies of Igboora to put a stop to people traveling during lockdown (stay-at-home) period to curtail the spread of communicable diseases such as Covid-19.

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