Application of Statistical Analysis of Factors Contributing to Crime Rate in Kogi State: The Need for Government Strategic Options

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Abstract: **The purpose of this study is to identify the factors that contributed to high crime rates in Nigeria.The statistical techniques used to carry out the analysis include; correlation: to check the relationship in between the factors, Kaiser-Meyer-Olkin Statistic(KMO):to check the sampling adequacy of the data used, Bartlett's test:to identify the data used if it is significant and appropriate for factor analysis and Principal Component Analysis (PCA):to reduce the dimensionality of the large data set and retain factors whose eigenvalues are greater than one according to the rule. Therefore, the result from the correlation showed that there was a strong positive relationship in between the following factors; unemployment, neglect of parents, bad habits from friends, bad government and religion which implies that they can be used to predict one another. On the hands of KMO statistic and Bartlett's test, the results revealed that there was sampling adequacy in the study with KMO = .630 and the data used for this study are significant and appropriate for factor analysis because $(\mathbf{X^2 = 672.365, P-value < 0.001})$ which is less than 5% level of significance. Finally, results from PCA retained only five PCs that could be used to explain a total of 62.296% variation that causes the high crime rates in Nigeria.**

Keywords: **Principal Component Analysis (PCA), Correlation, Factors, Crime rates**

I. INTRODUCTION

Acrime is a fact, a matter of law and it is not an opinion. As society changes, some actions which used to be criminal are no longer so. Likewise, some actions which were legal can become prohibited. In a democratic society like ours, someone charged with a crime has the opportunity to defend himself or herself. He or she will be deemed innocent until proved guilty by a criminal court of law. One can expect that different crimes will be affected by different factors. In particular, one might anticipate that property crime would be responsible to the state of economic opportunity, whereas violent crimes might be responsible to the availability of guns from the politicians after election. Many of these factors would be difficult to know as leading indicators to indicate the future trends.

Crime exists everywhere and it is significant with all types of people. This has led many researchers and scientists to research the various factors that influence the high rate of crime in their domains and how these factors can be controlled in an effort to reduce the crime rate. The causes of crime are complex which includes; unemployment, neglect of parents, poverty, wrong government, frustration, desperation, drugs, society, region, school dropout, political, peer pressure and regionalism. All these factors above are connected to reason why people break the law of a particular country. The factors mention can be controlled if government focus their efforts by providing job opportunity to the citizens who commit the crime.

In Nigeria, crime problem is multidimensional and is capable of undermining its corporate existence as well as efforts towards sustainable development. Nigeria corporate existence can be undermined by a number of factors among which is an escalating and uncontrolled crime problem (Tanimu, 2006). Security and crime have been deeply rooted in the political history of this country, particularly in recent time which has emerged as a key concept in Nigeria's struggle for good governance for sustainable democracy and development. Over the years, the rate of crime in Nigeria has been on the increased and these crimes are being carried out with more perfection and sophistication weapons. This has led to the formation of various vigilante groups to combat the crimes rate in some parts of the country (Fajemirokun et al, 2006).

Crime is committed based on the combination of difference factors. It will not make sense to control crime by a single strategy. A mixture of strategies is needed and is always appropriate for government or any of their agencies to apply it so as to control the crime rate in the society. The government who wants to control crime should seek as many factors as possible rather than concentrating all their efforts only on one or two factors among all. The results and interpretations of this study may help the government officers to control and reduce the high crime rate in the society (John, M.A. Bothos et al 2016). Also, one of the fundamental techniques to combat criminal activities is the better understanding of the dynamics of crime because it is thought as a moral threat and injury to the society, especially in Nigeria.

The aim of this study includes; to carry out the bivariate analysis between factors and responses of the people, to identify and determine the significant component causing criminal activities in Nigeria by using Principal Component Analysis and finally to reduce the dimensionality of the data set in this study by application of PCA.

II. LITERATURE REVIEW

In studying the offenders, there can be no presumption that the arrested, indicted, or prosecuted persons are criminals unless they are proven guilty beyond all reasonable doubts of a particular offence. One thing to bear in mind is that, one advantage of a legal definition of crime is that it is narrower and less ambiguous than a social definition of crime. It is a well held view that only a behavior that violates the criminal law by definition can be regarded as a crime. There exists a complex interplay between violence and crime. One can adduce that the noticeable consequence of violence is crime. Crime include many illegal forms of violence.

Conceptually, Richard (2009), defines crime as a violation of law and therefore an act of deviance (i.e. a rule-violation). Majority of criminological theories currently used by crime researchers form on individual offenders but a considerable number of theorists have advocated some variation of the ecological approach to crime studies (Wilcox, Land and Hunt, 2003), this is because it is believed that crime cannot be understood without having accurate knowledge of the full context i.e. demographic, economic, geographic and social in which it occurs (Meagan, 2005). The most immediate geographic contexts are the neighborhoods in which people live the place when their lifestyles situate them. Wider geographic contexts, reflecting variation in both individual-level resources and society-wide norms, are determined by the different activities, both routine and non-routine, in which these people engage (Meagan, 2005). Montaldo (2013) said that crime occurs when someone breaks the law by an overt act, omission or neglect that can result in punishment. A person who has violated a law, or breached a rule is said to have committed a criminal offense. According to National Crime Prevention Strategy (1996), crime results in the deprivation of the rights and dignity of citizens, and poses a threat to peaceful resolution of difference and rightful participation of all in the democratic process. Empirically, National Bureau of Statistics report crime statistics on reported offences which reflected that a total of 125,790 cases were reported in 2016 in Nigeria. Offence against property has the highest number of cases reported with 65, 397 of such cases reported while offence against persons recorded 45,554 cases. This is addition to the finding of Bako et al (2018) that Cleary opine that there are two types of violence-the incidental violence, which may arise out of actions of protest or affirmations of certain views, and intended violence, which is aimed at the violation of others. Defining violence however according to literature has proved to be more nebulous and problematic. Thus, the review will start be defining what violence is actually be.

2.1 Categories Of Violence

Although, the difference kinds of violence are coinciding and cross-cutting, calling far holistic understanding, there is a need to categories the phenomenon in order to be able to design interventions to prevent or reduce it. The conceptual framework makes a four-fold distinction between political, institutional, economic and social violence- with each category identified in terms of the motivation for the physical act that consciously or unconsciously is used to gain or maintained power. The Table 1 spectacles the different categories and manifestation violence in our areas of locations.

Table 1: Categories of Violence

Category of Violence	Type of Violence	Manifestation
Political	• State end non-state violence	• Guerrilla conflict • Paramilitary • Political assassination • Armed conflict between political parties.
Institutional	• Violence of state and other informal institutions. • Including the private sector.	• Extract-judicial killings by police • Physical or psychological abuse by health and education workers • State community vigilante-directed for social cleansing of gangs and street children • Lynching of suspected criminal by community members
Economic	• Organized • Business interests • Delinquents • Robbers	• Kidnapping • Armed robbery • Drug-trafficking • Small-arms dealing • Street theft, robbery and crime
Socio-Economic	• Gangs • Street children • Ethnic violence	• Territorial or identity based on "Turf Violence" • Robbery and theft • Petty-theft • Communal riots
Social	• Child abuse • Inter-generational conflict between parents and children • Gratuitous /routine daily violence	• Physical and psychological male-female abuse • Physical and sexual abuse • Argument that get out of control • Incivility in areas such as traffic, bad road, bar fights and street confrontations

Source: Moser and Winton, 2002

As high listed in Table 1 above, social violence is gender-based i.e. linked to gendered power relations and constructions of masculinities. Gender-based violence includes intimate partner violence and child abuse inside the home, as well as sexual abuse in the public arena. Social violence also includes ethnic violence or territorial or identity-based violence linked with gangs. Economic violence on the other side is motivated by material gain and associated with street crime which include mugging, robbery and violence that linked to drugs and kidnapping (Moser,2004). Closely related to economic violence is the institutional violence especially when associated with the police and judiciary but also by officials in the sector ministries such as health and education as well as groups operating outside the state, such as social cleansing vigilante groups. Finally, political violence, driven by the will to win or

hold political power which include guerrilla or paramilitary conflict or political assassination.

Despite the fact that there is no uniformity checklist as to what constitutes violence in Table 1 above provides a summary road map of a few of the extensive, complex manifestations of violence within the four categories (Scheper-Hughes and Bourgeois, 2003).

2.2 Crime Analysis Using Pca

The Principal Component Analysis is very useful in crime analysis because of its robustness in data reduction and in determining the overall criminality in a given geographical area. If some group of measures constitute the scores of numerous variables, the researcher may wish to combine the score of the numerous variables into smaller number of supervariable to form the group of the measures. This problem mostly happens in determining the relationship between some socio-economic factors and crime incidences. PCA uses the correlations among the variables to develop a small set of components that empirically summarized the correlations among the variables. Elizabeth (2004) in her effort to determine a model that provides a general relationship between violence and some structural measures.

In one of the measures, the concentrated disadvantage index, the PCA of the structural measures supported the combination of the following measures like; percentage of residents who are African American, percentage of residents who are unemployed, percentage of residents living below the poverty line, percentage of families receiving public assistance and percentage of families headed by a single parent with children under 18 years.

Similarly, in a study to examine the statistical relationship between crime and socio-economic status in Ottawa and Saskatoon, the PCA was employed to replace a set of variables with a smaller number of components which are made up of inter-correlated variables representing as much of the original data set as possible.

The Principal Component Analysis can also be used to determine the overall criminality when the first eigenvector shows approximately equal loadings on all variables than the first PC measures of the overall crime rate. In Print Com (2003) for 1977 US crime data, the overall crime rate was determined from the first PC, and the same result was achieved by Hardle and Zdenek (2007) for the 1985 US crime data.

III. RESEARCH METHODOLOGY AND PROCEDURES

3.1 Data Description

The data used in this study was obtained via some set of designed questionnaires for 1200 respondents within the Kogi State metropolis. A total of 430 respondents was considered for the analysis. The data collected was analyzed by using descriptive statistics, correlation analysis and principal component analysis (PCA).

3.2 Principal Component Analysis

The Principal Component Analysis is probably the most popular multivariate statistical technique and it is used by almost all scientific disciplines. It is the oldest multivariate technique. Its origin can be traced back to Pearson (1901) and Cauchy (1829) but its modern instantiation was formalized by Hoteling in 1989 who also coined the term of Principal Component Analysis. It is used to reduce the dimensionality of the data.

3.3 Derivation Of PCA

Let a $q-$dimensional random vector of X is given as

$X_i = (X_1, X_2, \ldots \ldots, X_q)$ with mean vector $of\ \mu_i = (\mu_1, \mu_2, \ldots \ldots, \mu_q)$ and dispersion matrix $of\ Var(x) = \sum = \begin{pmatrix} \sigma_i^2 & \sigma_{12} \ldots \ldots & \sigma_{1q} \\ \sigma_{21} & \sigma_2^2 \ldots \ldots & \sigma_{2q} \\ \sigma_{q1} & \sigma_{q2} \ldots \ldots & \sigma_q^2 \end{pmatrix}$ such that PCA seeks for a new set of

dependent variable of $Y_1, Y_2, \ldots \ldots, Y_q$, where $i = 1, 2, \ldots \ldots, q$

then,

the combination of both $b_{ij} = (b_{1j}, b_{2j}, \ldots, b_{qj})$ and $X_i = (X_1, X_2, \ldots \ldots, X_q)$ gives the linear combination

$Y_j = b_{1j}X_1 + b_{2j}X_2 + \cdots + b_{qj}X_q = b_{ij}X_i$

Where $j = 1, 2, \ldots, q$ and $b_{ij} = (b_{1j}, b_{1j}, \ldots, b_{qj})$ are coefficients regression

The $Y_j'^S$ are linear combination with coefficients $b_{1j}, b_{2j}, \ldots \ldots b_{qj}$ where

$$Y_{ij} = (b_{1j}, b_{2j}, \ldots \ldots, b_{pj}) \begin{pmatrix} X_1 \\ X_2 \\ . \\ . \\ X_q \end{pmatrix}$$

and

$Y_1 = b_{i1}X_1, \ Y_2 = b_{i2}X_2, \ \ldots Y_q = b_{iq}X_q$

The procedures used to obtain b_{ij} for Y_j at j^{th} PC of X will need the following properties

- The $Y_j'^S$ must be orthogonal

- Each Y must capture the maximum variance remaining in X, where we maximize the variation in Y that subject to the constraint $b_i b = 1$

- For instance, if Y_1 is the first PC we seek for b_1, such that

(i) $Var(Y_1) = b_i Var(X)b_1$
$= b_{i1} \sum b_1$ is a maximum

(ii) $b_{i1}b_1 = \sum b_1^2 = 1$

- If Y_2 is the second PC after determining Y_1 and it is uncorrelated with Y_1, we seek for b_2 such that

(i) $Var(Y_2) = b_{i2} Var(X)b_2 = b_{i2} \sum b_2$ is a maximum

(ii) $b_{i1}b_2 = \sum b_2^2 = 1$

(iii) $b_1 b_2 = 0$, which means that Y_1 and Y_2 are orthogonal

The procedure continues in the same way to find the jth of PC such that

(i) $Var(Y_J) = Var(b_j^I X) = b_{ij} \sum b_j$ is a maximum

(ii) $b_{ij}b_j = \sum b_j^2 = 1$

(iii) $b_{ij}b_m = 0, j \neq m$ i.e, Y'^S_j are orthogonal

3.4 Procedure For Selecting The First Pc

To find the first PC, we seek for b_1 in such a way that

$Y_1 = b_{11}X_1 + b_{21}X_2 + \cdots + b_{p1}X_p = b_{i1}X_i$ is the PC of X subject to the constraint

(i) $Var(Y_1) = Var(b_1^1 X_1) = b_1^1 \sum b_1$ is a maximum

(ii) $b_1^1 b_1 = 1$

3.5 Procedure For Selecting The Second Pc

Let Y_2 be the second PC of X, the $Y_2 = b_{2i}X_2$, then we seek for b_2 in a such a way that

(i) $Var(Y_2) = Var(b_2^1 X_2) = b_2^1 \sum b_2$ is a maximum

(ii) $b_2^1 b_2 = 1$

(iii) $b_2^1 b_2 = 0$

All subsequent principal components have the same property. They are linear combination that account for as much of the remaining variance as possible and they are not correlated with the other principal components.

For additional component, the calculation of ith principal component for Y_i and finding $b_{i1}, b_{i2}, \ldots \ldots, b_{ip}$ to maximize the variation of the new component is given below.

The variance of Y_i is given as

$Var(Y_i) = b_i^1 \sum b_i$s

and its subject to the constraint is given as

$b_i^I b_i = 1$

$b_i^I b_i = 0$, it means they are orthogonal

Note that all the principal components are uncorrelated with one another.

IV. ANALYSIS AND RESULTS

Table2: Bivariate Analysis between Factors Contributing to High Rate Crime and Respondents Answered

Causes of Crime	Respondent Answered (Ranking) n (%)					N	Mean	SD
	Strongly Agreed	Agreed	Neutral	Disagreed	Strongly Disagreed			
Unemployment	149(34.7%)	107(24.9%)	67(15.6%)	43(10.0%)	64(14.9%)	430	2.56	1.428
Neglect of Parents	132(30.7%)	113(26.3%)	95(22.1%)	34(7.9%)	56(13.0%)	430	2.54	1.382
Bad Habit from Friends	133(30.9%)	126(29.3%)	60(14.0%)	58(13.5%)	53(12.3%)	430	2.45	1.359
Bad Government	131(3.05%)	105(24.4%)	90(20.9%)	56(13.0%)	48(11.2%)	430	2.47	1.372
Religion	140(32.6%)	111(25.5%)	76(17.7%)	53(12.3%)	50(11.6%)	430	2.50	1.339
School Drop Out	167(38.8%)	118(27.4%)	64(14.9%)	38(8.8%)	43(10.0%)	430	2.41	1.327
Drugs	120(27.9%)	142(33.0%)	48(11.2%)	75(17.4%)	45(10.5%)	430	2.43	1.387
Poverty	151(35.1%)	172(40.0%)	60(14.0%)	18(4.2%)	29(6.7%)	430	2.28	1.230
Society	143(33.6%)	156(36.3%)	77(17.9%)	29(6.7%)	25(5.6%)	430	2.04	1.138
Politics	156(36.5%)	166(38.6%)	56(13.0%)	25(5.8%)	26(6.0%	430	2.03	1.147
Desperation	118(27.4%)	167(38.4%)	64(14.9%)	38(8.8%)	43(10.0%)	430	2.25	1.158
Regionalism	123(28.6%)	172(40.0%)	77(17.9%)	34(7.9%)	24(5.6%)	430	2.28	1.230

Source: SPSS 20
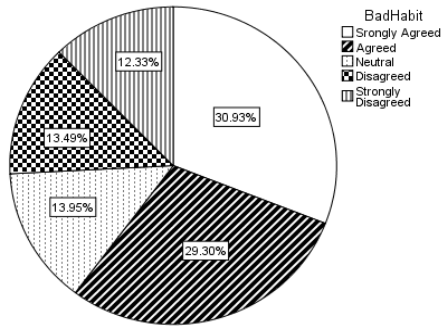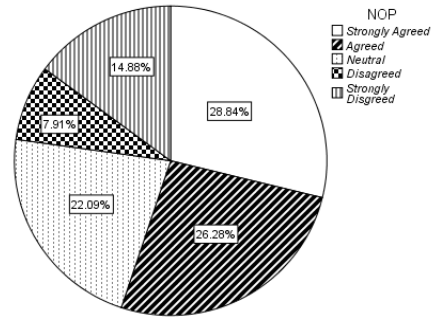
Figure 1: Pie Chart for Bad Habit from Friends
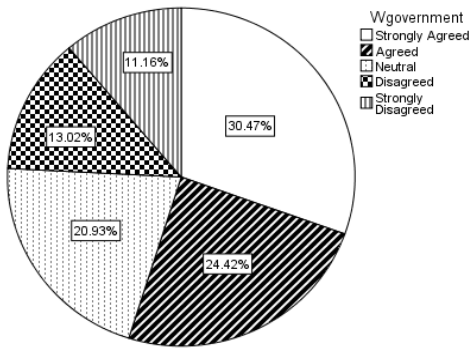

Figure 2: Pie Chart for Wrong Govt

Figure 3: Pie Chart for Unemployment

Figure 4: Pie Chart for Neglect of Parents

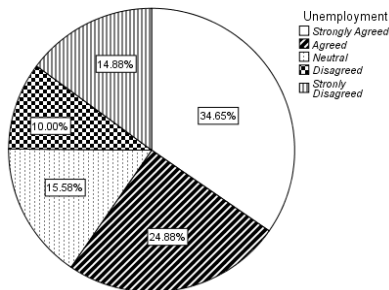Source: SPSS 20

From Table 2 above, the number of respondents who are strong agreed recorded high percentage on unemployment, neglect of parents, bad habit from friends, bad government, religion and school drop out which implies that they are the most important variables that influence the high crime trends in Nigeria.

Also, any factor with high variance is a threat to crime rate compare with less factors. Therefore, results revealed that high variance was recorded with the following factors as unemployment (σ^2 =2.039), neglect of parents (σ^2 =1.910), bad government (σ^2 =1.882), bad habits from friends (σ^2 =1.847) and lastly religion (σ^2 =1.793).

In the same Table 2 on average values, the results revealed that high value of mean was recorded on unemployment, neglect of parents and wrong government than other factors in this study. Their values are given as follows unemployment ($\mu = 2.56$), neglect of parents ($\mu = 2.54$) and bad government ($\mu = 2.47$).

Finally, Figures 1, 2, 3 and 4 above showed high percentage of respondents on strongly agreed with the following factors: unemployment, neglect of parents, bad habits from friends and bad government.

Table 3: Correlation Matrix for Causes of Crime Rate in Nigeria Slums

	Unemployment	NOP	Bad H	W-Gov	REG	Drugs	SDO	DESP	PTY	SOC	PO	RE
Unemployment	1											
NOP	.659	1										
Bad Habit	.640	.704	1									
Bad-Govt	.607	.616	.717	1								
Religion	.606	.587	.678	.691	1							
Drugs	.602	.388	.523	-.258	.655	1						
SDO	.534	.472	.598	.448	.645	.161	1					
Desperation	-.431	.148	.234	.456	.098	.114	.048	1				
Poverty	.278	-.192	-.176	.221	.335	.149	.206	.185	1			
Society	-.229	-.273	.214	.329	-.153	-.214	.308	-.074	.146	1		
Politics	.382	.194	,291	.140	.247	.351	-.134	.105	-.200	-.108	1	
Regionalism	-.103	.099	-.268	-.350	.146	-.290	.427	.144	-.293	-.139	-.136	1

Source: SPSS 20

The correlation results above revealed the relationship among the level of factors that contribute to high rate crime in Nigeria. From the results, there is a strong positive relationship between unemployment, neglect of parents, bad habits from friends, bad government, drugs and school drop-out. The results showed that the relationship between those factors are statistically significant at 5% level of significance. This implies that they are major factors contributing to high rate of criminal activities in Nigeria. The factors with negative low correlation are desperation, society, politics, and regionalism which have less contributors to high rate crime.

Table 4: Kaiser-Meyer-Olkin (KMO0 measure of Sampling Adequacy and Bartlett's Test of Sphericity

Kaiser-Meyer-Olkin	.630
Bartlett's Test of Sphericity	672.365
df	66
sig	<.001

Source: SPSS 20

The results from the Kaiser-Meyer-Olkin statistic (KMO=**0.630**) showed that adequate sampling is used for this study. The null hypothesis states that the correlation matrix is an identity matrix which was rejected at 5% level of significance with Bartlett's test $X^2 = 672.365, p - value = < 0.001$. This implies that the results of the correlation matrix on the data set are appropriate for factor analysis.

Table 5: Communalities Initial Extraction

	Initial	Extraction
Unemployment	1.000	.743
Neglect of Parents	1.000	.750
Bad Habit from Friends	1.000	.734
Bad Government	1.000	.718
Religion	1.000	.625
Desperation	1.000	.433
Politics	1.000	.637
Society	1.000	.693
Drugs	1.000	.606
Regionalism	1.000	.545
School Drop Out	1.000	.521
Poverty	1.000	.603

Source: SPSS 20

In Table 5, the results showed that unemployment, neglect of parents, bad habits from friends and bad government were best represented factors in contributing to high rate of crime activities in Nigeria because a high proportional of variance was explained by the principal component analysis results.

Table 6: Total variation explained by causes of crime rate committed in Nigeria

Component	Initial Eigenvalues			Extracting sums of Square Loading			Rotational sums of squared loading		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.352	19.596	19.596						
2	1.531	12.754	32.350						
3	1.441	12.006	44.356						
4	1.108	9.236	53.592						
5	1.044	8.702	62.294	2.352	19.596	19.596	2.025	16.874	16.874
6	0.922	7.684	69.978	1.531	12.754	32.350	1.498	12.467	29.341
7	0.835	6.956	76.934	1.441	12.006	44.356	1.445	12.038	41.379
8	0.716	5.965	82.899	1.108	9.236	53.592	1.358	11.320	52.699
9	0.640	5.331	88.230	1.044	8.702	**62.294**	1.151	9.595	**62.294**
10	0.545	4.542	92.772						
11	0.535	4.461	97.232						
12	0.332	2.768	100.000						

Source: SPSS, 20

The results from this Table 6 showed the eigenvalue and cumulative of variance percentage. The rule is this Table 6 states that retain factors whose eigenvalue are greater than one, otherwise remove them.

From the results above, it would be necessary to retain the first five factors of PCs which includes unemployment, neglect of parents, bad habits from friends, bad government and religion among others. This implies that the first five of PCs has retained

62.294% of the total variation among all the factors used in this study. This means that those five factors can be used to explain the other factors in the PCs.
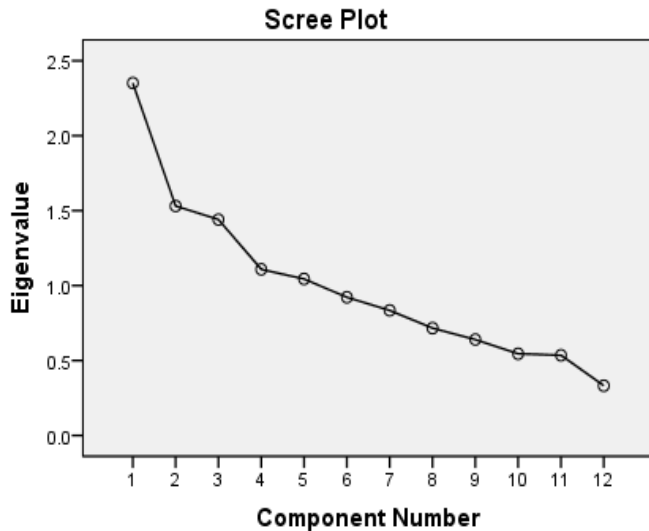

Figure 5: Score Plot for Components against Eigenvalues

Source: SPSS, 20

This plot tells us the number of components to retain after carryout the principal component analysis on data set. The plot revealed that five components are to be retained because their eigenvalues are greater than 1. According to the results in this score plot, it would be reasonable to retain unemployment, neglect of parents, bad habits from friends, bad government and religion which are the major factors contribute to crime rate trends in Nigeria.

Table 7: Eigen Vectors: Component Factors Estimate

Component	1	2	3	4	5
Neglect of Parents	.785	.280		-.164	-.158
Unemployment	.759	.260	.134	.212	-.187
Bad Habit from Friends	.694	.176		-.361	
Bad Government	.673	.377	.118	-.103	.126
School Drop Out	.602	.447		-.234	.310
Society	-.137	-.166	.352	-.185	
Religion	.515		.805		.213
Poverty	-.105	.697	-.519	-.240	
Drugs	.278	.638	-.401	.671	.187
Politics	.454		-.127	.458	
Desperation	-.246		-.375	-.182	.673
Regionalism	.209	-.462	.205	-.235	.566

Source: SPSS 20

In Table 7 above, it concentrated only on the five PCs that predict the 62.294% of total variation in the data set used in this study.

The component 1: has positive relationship with factors that causes high rate of crime in Nigeria. The factors that cause high rate of crime include; unemployment, neglect of parents, bad habits from friends, bad government, school drop-out, religion and politics.

The component 2: has negative relationship with society and regionalism but with high positive relationship in poverty and drugs.

The component 3: has negative relationship with poverty, drugs, politics and desperation but high positive association only with religion.

The component 4: has negative relationship with most of the factors except unemployment, drugs and politics while high and low positive relationship was recorded with drugs and politics respectively.

The component 5: identify the positive relationship among all the factors in the component except neglect of parents and unemployment. The high positive relationship was recorded in desperation and regionalism.

V. CONCLUSIONS

In this study, the results from correlation analysis indicate that there is a strong positive relationship in between unemployed, neglect of parents, bad habits from friends, bad government and religion which implies that they can be used to predict one another.

Similarly, the results from score plot revealed that five components are be retained in this study as a result of not violating the rule which states that any factor whose eigenvalue is less than 1 should not be retained. Therefore, the results revealed that five components out of twelve are the major causes of high crime rate in Nigeria.

In the same manner, the PCA showed that five PCs can be used to explain a total variability of 62.294% in this study. This implies that the crime rate committed in Nigeria are mostly caused by these five PCs which include: unemployment, Neglect of parents, bad habits from friends, wrong government and religion.

Lastly, the causes of high crime rate in Nigeria can be traced to the five PCs listed by eigenvalue table and they can be addressed if the parents and religion bodies play their roles by educating and preaching to the youths and people the consequences of committing a crime in any particular nation.

Finally, government on their own part should empowered the youths by providing adequate job opportunity for them and arrest those who commit the crime.

REFERENCES

[1] Aduloju, O.T. et al (2020). The just City: Poverty, Deprivation and Alleviation Strategies Page 392-406. Published: Department of Urban and Regional Planning, Federal University of Technology, Akure, Nigeria.

[2] Bako, A.T., Aduloju, O.T., Abdulyakeem, A.O. and Moyo, U.T. (2018). Physical Planning Approach to Urban Youth Violence in Ilorin Metropolis.

[3] Cattell, R.B. (1966). The Scree Test for the Number of Factors; Multivariate Behavioral Research 1, 245–276.

[4] Fajemirokun, F., Adewale, O., Idowu, T., Oyewusi, A., and Maiyegun, B. (2006). A GIS Approach to crime Mapping and Management in Nigeria: A Case Study of Victoria Island Lagos. www.oicrf.org

[5] Jolliffe, I. T. (2002). Principal Component Analysis 2nd Edition, Springer–Verlag. New York

[6] Kendall Williams and Ralph Gedeon (2004). A Multivariate Statistical Analysis of Crime Rate in US Cities.

[7] Nasiru M. O. et al (2017). Principal Component Analysis of Crime Data in Gwagwalada Area Command, Abuja from 1995–2015, American Journal of Theoretical Applied Statistics, 2017, 6(1): 38–43.

[8] National Crime Prevention Strategy (1996). National Crime Prevention Strategy: Summary Retrieved Form. http://www.info.sov.29/otherdoce/1996/crime/.htm accessed on 06/12/12.

[9] Meagan, E. (2005). Geographies of Urban Crime; An Intraurban study of Crime in Nashville

[10] Montaldo, C (2013). What is a Crime Retrieved Form? http://crime.about.com/od/crime- 101/9/what-is-a-crime.html accessed on 5/12/2012.

[11] Moser, C.O. (2004). Urban Violence and Insecurity: An Introductory Road Map. Environment and Urbanization, 16(2),3-16. TN; Portland, OR; and Tucson, AZ, Arizona: U.S. Department of Justice.

[12] Olufolabo O. O., Akintande O. J. and Ekum M. I. (2015). Analyzing the Distribution of Crime in Oyo State using Principal Component Analysis. IOSR Journal of Mathematics (IOSR–JM) vol.11 issue 3.

[13] Oluwafemi, O.J, Salawu A. and Jimoh, J.O. (2020). Conflicts Resolution and National Development in Kogi State Polytechnic, Lokoja; Lokoja Journal of Applied Sciences; vol 3 no 1; ISSN:2550-8032. Published by School of Applied Sciences, Kogi State Polytechnic, Lokoja.

[14] Print Com (2003). http://support.sas.com/onlinedoc/912/get Doc/common. hlp/image/Copy rite. Htm.

[15] Rencher, A. C. (2002). Methods of Multivariate Analysis 2nd Edition, John Wiley and son, New York.

[16] Rev. Fr. Dr. Ndikaru Wa Teresia (2011). Crime Causes and Victimization in Nairobi city Slums. International journal of Current Research, 3(12):275–285.

[17] Richard, A. J. and Dean, W. W. (2001). Applied Multivariate Statistical Analysis 3rd Edition Prentice–Hall, New Delhi.

[18] Richard, B. (2009). Violence, Crime, and Violent Crime. International Journal of Conflict And Violence, 111(1),23-39.

[19] Scheper-Hughes, N. (2003). Violence in war and peace: An Anthology. Oxford: Blackwell.

[20] Soren, H. (2006). Example of Multivariate Analysis in R – Principal Component (PCA). Httpgene://tics.agrsci.dk/statistics/courses/recourse-djf2006/day3/PCA-notes.

[21] Tanimu, B. (2006). Convict View of the Criminal Justice System in Nigeria, In: Hassan Saliu et. al. (eds.) (2006). The National Question and Some Selected Tropical Issue in Nigeria. Ibadan. Vintage Publication.

[22] The Seventh United Nations Survey on Crime Trends and the Operation of Criminal Justice System (1998–2000).

[23] The Eighth United Nations Survey on Crime Trends and the Operation of Criminal Justice System (2001–2002).

[24] The Seventh United Nations Survey on Crime Trends and the Operation of Criminal Justice System (1998–2000).

[25] The Tenth United Nations Survey on Crime Trends and the Operation of Criminal Justice System (Tenth CTS, 2005 – 2006). www.unodc.org. Retrievedv2015-11-23.

[26] Wafula, Mike Erick et al (2019). Application of Principal Component Analysis to Crime Rate Case Study: Mathare Slums, Nairobi, Country in Kenya, American Journal of Theoretical and Applied Statistics, 2019, 8(1): 7–17.

[27] Wilcox, P., Land, K., and Hunt, S. (2003). Criminal Circumstance: A Dynamic Multicontextual Criminal Opportunity Theory. New York: Aldine de Gruyter.