

Analysis of Crimes of Juveniles Delinquency Using Statistical Techniques

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Abstract:- Juvenile delinquency also known juvenile offending, is the act of participating in unlawful behavior as a minor or individual younger than the statutory age of majority. This paper is based on a research project in which the Juvenile delinquency is analyzed by researchers. A researcher has been collecting the data from internet (Website: ncrb.gov.in).

This research aims to explore the educational background of the criminal along with the family background and their economic status which affects the juveniles or which results in the crime among juveniles. The present study leads to the conclusion that the low income of the family, family background (nuclear or joint or homeless), lack of parental supervision on their children is the main cause which is leading to the rise in this trend of delinquency.

Keywords:- Juvenile Delinquency, Family Background, Educational Background, Apprehended.

I. INTRODUCTION

A nation's children are its supremely important asset and nation's future lies in their proper development. As the present-day world, it is the centre of all thinking to secure the next generation. Juvenile crime has been increased. A healthy and educated child of today is the active and intelligent citizen of tomorrow. Hence it is need to study of children and there is also need to protect them but very little studied about Juveniles.

A juveniles or child means a person who has completed eighteen year of ago but in today's time the Juveniles are committing various heinous crimes such as rape, robbery, theft, dacoits. For that matter they should be considered as adults and not minors. The concept of Juveniles justice was derived from the concept of Juveniles delinquency. The young children's fails to understand the abnormal situation of life so in this presentation we are going to focus into those thoughts. Therefore, study with regard to the living condition of the Juveniles in the particular area, their economic, social and educational status, their family background, their relationship between parents was studied.

So we interested to study the relationship between age and type of crimes, year and number of crimes, family background and crimes by using Statistical Methods.

II. LITERATURE REVIEW

- Becker (1968) had reported that juvenile's delinquency could be a rational response to the incentives for legal and criminal activities. According to him the estimation shows that the youth will engage in criminal behavior if the potential gains are large enough and likelihood of substantial punishment is relatively low.
- Wright and Wright (1994) according to him the family is the backbone of the human society, the children who are generally avoided by their parents or they are rejected by them are more prone to delinquency because of the lack of proper supervision. Due to lack of supervision they are generally influenced by the peer group and nearby surroundings. It is said that the single parent families especially where mother is only family are producing more delinquents but Wright and Wright (1994) research have showed that the mostly delinquents belongs to those who are living with both the parents
- Weather burn and Lind (1997) they observed the reason for the delinquency in rural and urban areas. According to them socio-economic reasons are the basic cause which leads to the increasing offence in the rate among juveniles.
- Levitt and Lochner (2000) had studied the juvenile's criminal involvement. Biological factors i.e. being male having low intelligence and short time horizon are of the determinants of crime. Family background factors .i.e. erratic parental discipline, lack of adequate supervision and maternal rejection are linked with criminal involvement whereas social factors include income inequality and rejection influences the delinquent behavior among youth.
- Camenor and Phillips (2002) observed that fathers play a critical role in the rearing of boys at a tender age and having a step-father also increases the delinquency among the children rather than having a step-mother.

III. METHODOLOGY AND DATA COLLECTION

Our Geographical area under consideration is all the metropolitan cities in India. For this project we have collected secondary data from internet (Website: ncrb.gov.in). We collected data of 2 years (Year 2016 and year 2017). The collected information was later analyzed to obtain the required interpretation and findings. We have taken 19 metropolitan cities which represent rate of apprehended Juveniles in Metropolitan cities In India.

❖ *Statistical Tools:*

1. Graphical Tools: Multiple Bar Diagram.
2. Testing Hypothesis
 - Equality of mean Test (t-test).
 - Chi-Square test for attribute
 - Fitting of discrete Uniform Distribution

❖ *Objectives:*

- To study the Number of Juveniles apprehended in different metropolitan cities for Year 2016 and 2017.

- To study the distribution of crime over different geographical region in India.
- To study of Juveniles by using Quantitative data.
- To evaluate the factor that determined the relationship between official statistics and the reality of crime.

❖ *Graphical Representation: Juveniles apprehended during the year 2016 and 2017 in Metropolitan cities*
 Multiple bar diagram for city wise distribution of crime

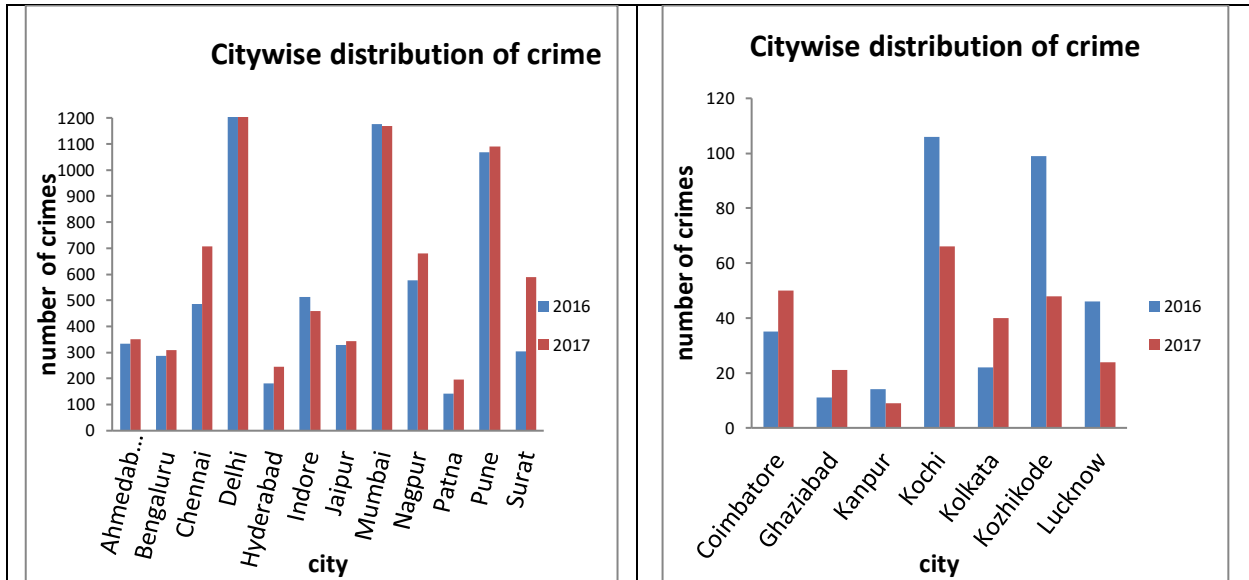


Fig 1

Multiple bar diagram for type of crimes and age group of apprehended juveniles.

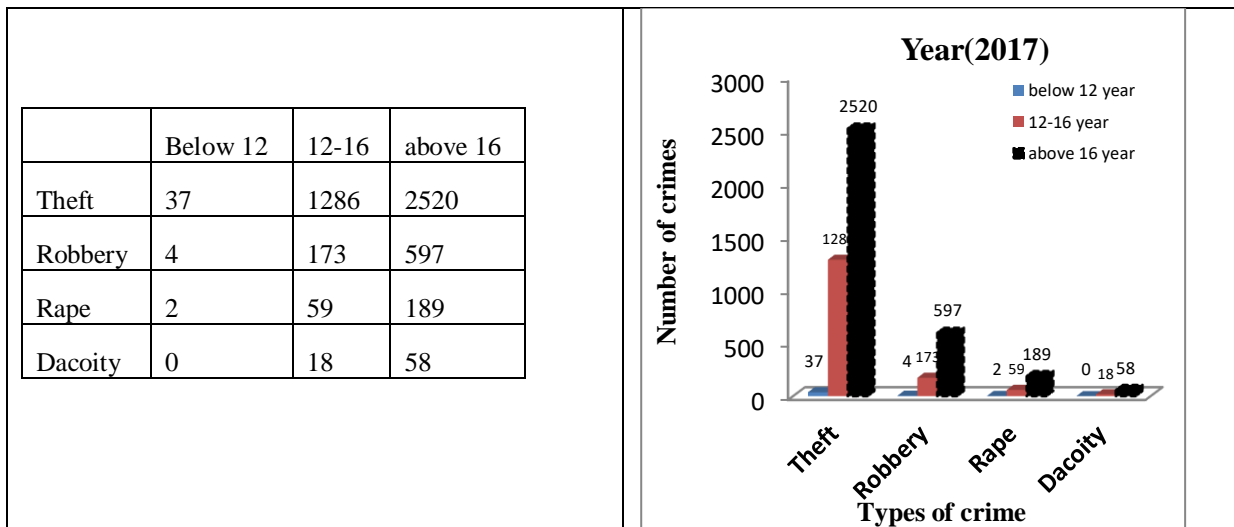


Fig 2

Family background wise distribution of crime			Education wise distribution of crime		
	Year			Year	
Family Background	2016	2017	Education	2016	2017
Living with parents	7842	8050	Illiterate	1601	1201
Living with guardians	1011	598	Primary Educated	3978	2649
Homeless	488	1016	Primary to HSC	3441	4421
			Above HSC	321	1393

Table 1

❖ *Testing of Hypothesis:*

i) Test of testing equality of means

μ_1 = Mean of number of Juveniles apprehended during the year 2016

μ_2 = Mean of number of Juveniles apprehended during the year 2017

$$t_{cal} = \frac{\bar{X} - \bar{Y}}{s \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} = \frac{491.6315 - 508.6315}{791.54 \sqrt{\frac{1}{19} + \frac{1}{19}}} = 0.0662$$

$t_{tab} = 2.02805$ at 5% level of significance

ii) Fitting of Discrete Uniform Distribution for Year 2016 & 2017.

For 2016

H_0 : Crimes are uniformly occurred or not in different geographical region.

H_1 : Crimes are not uniformly occurred or not in different geographical region.

$\chi^2_{cal} = 24957.14446$, $\chi^2_{tab} = 28.8692$ at 5% level of significance

For 2017

H_0 : Crimes are uniformly occurred or not in different geographical region.

H_1 : Crimes are not uniformly occurred or not in different geographical region.

$\chi^2_{cal} = 20222.18$, $\chi^2_{tab} = 28.8693$ at 5% level of significance

iii) Independence of attributes age and type of crime

For 2016

H_0 : Age and type of crime are independent.

H_1 : Age and type of crime are not independent.

$\chi^2_{cal} = 5.6769$, $\chi^2_{tab} = 12.5916$ at 5% level of significance

For 2017

H_0 : Age and type of crime are independent.

H_1 : Age and type of crime are not independent.

ANOVA FOR 2016

Source of Variation	Sum of Squares	df	MS	F_{cal}	P-value	F_{tab}
Education	3067430.1050	18	170413	7.3160	5.60E-09	1.7982
Geographical area	448296.6711	3	149432	6.4153	0.00085	2.7757
Error	1257823.5790	54	23293			
Total	4773550.3550	75				

Table 2

$\chi^2_{cal} = 49.7069$, $\chi^2_{tab} = 12.5916$ at 5% level of significance

❖ *Family background*

For 2016

Here we denote the variables,

μ_1 = Number of crime done by juveniles who live parents.

μ_2 = Number of crime done by juveniles who live guardians.

μ_3 = Number of crime done by juveniles who are homeless.

I) $H_0: \mu_1 = \mu_2$ vs $H_1: \mu_1 \neq \mu_2$
 $t_{cal} = 2.2203$, $t_{tab} = 2.02809$ at 5% level of significance

II) $H_0: \mu_1 = \mu_3$ vs $H_1: \mu_1 \neq \mu_3$
 $t_{cal} = 7.4251$, $t_{tab} = 2.02809$ at 5% level of significance

III) $H_0: \mu_2 = \mu_3$ vs $H_1: \mu_2 \neq \mu_3$
 $t_{cal} = 3.046920433$, $t_{tab} = 2.02809$ at 5% level of significance

For 2017

I) $H_0: \mu_1 = \mu_2$ vs $H_1: \mu_1 \neq \mu_2$
 $t_{cal} = 0.2719$, $t_{tab} = 2.02809$ at 5% level of significance

II) $H_0: \mu_1 = \mu_3$ vs $H_1: \mu_1 \neq \mu_3$
 $t_{cal} = 2.4276$, $t_{tab} = 2.02809$ at 5% level of significance

III) $H_0: \mu_2 = \mu_3$ vs $H_1: \mu_2 \neq \mu_3$
 $t_{cal} = 0.903306024$, $t_{tab} = 2.02809$ at 5% level of significance

❖ *Education and Geographical area*

H_{01} : Average number of crimes had done by juveniles who are illiterate, having education up to primary, primary to HSC, HSC and above are same

H_{02} : There is no significant effect of different geographical region on education of crime juveniles.

ANOVA FOR 2017

Source of Variation	Sum of Squares	df	MS	F_{cal}	P-value	F_{tab}
Education	2558866	18	142159	8.5086	4.0E-10	1.7982
Geographical area	341618	3	113873	6.8155	0.00056	2.7757
Error	902214	54	16707.7			
Total		75				

Table 3

IV. REGRESSION ANALYSIS

The statistical techniques for modeling the relationship between response and predictor variable is called regression analysis. The response variable is also called as dependent variable and predictor variable is called as independent variable. Regression analysis is first invented by Francis in 1877. The regression equation is,

$$Y = a + bX$$

where Y =number of crimes X =year,

To estimate the value of a and b using least square method we get,

a = 33363.36, b = 18.65 Therefore, the regression equation becomes,

$$Y = 33363.36 + 18.65X$$

Therefore, the number of crimes for year 2013 is 33476 and the number of crimes for year 2014 is 33494

V. CONCLUDING REMARKS

A mostly crime increases in all cities in year 2017 than 2016 except Indore, Kanpur, Kochi, Kozhikode and Lucknow. In all the crime theft is mostly occurring crime and the crime occurred in the age group above 16 years. Most of the Juvenile delinquencies are live with parents. It occurred because their family background is criminal. The Juvenile criminals are not much educated, they are mostly learned upto primary. The number of crimes is occurred is different in different area. Age and the type of crime are independent in 2016 but this behavior is change in 2017, it is dependent. The average number of crime done by Juvenile is not same in 2016 but it is same in 2017. By using regression analysis we estimate the total number of crimes in 2013 is 33494.

REFERENCES

- [1]. Camenor and Phillips (2002).The Impact of Income and Family Structure on Delinquency. Journal of Applied Economics, Vol. V, No.2 (Nov 2002), 209-232
- [2]. Levitt, S. and L. Lochner. (2000). The Determinants of Juvenile Crime. In J. Gruber (Ed.), "Risky Behavior by Youths. University of Chicago Press.
- [3]. Levitt, S. and L. Lochner. (2000). The Determinants of Juvenile Crime. In J. Gruber (Ed.), "Risky Behavior by Youths. University of Chicago Press.
- [4]. Becker, G. (1968). Crime and Punishment: An Economic Approach. Journal of Political Economy 76(2):169-217.

[5]. Weatherburn D. and Lind B. (1997).Social and Economic Stress, Child Neglect and Juvenile Delinquency. NSW Bureau of Crime statistics and Research, Attorney General's Department

[6]. Wright, Kevin N. and Karen E. Wright.(1994). Family Life, Delinquency, and Crime: A Policymakers Guide. Research Summary. Washington DC: OJJDP 4-21.