SNDT Arts and Commerce College for Women, Pune

Study of Suicide Cases Registered in Pune During COVID19 Lockdown in the year 2020

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Dr. Madhavi Kulkrani, Dr. Manasee Rajhans, and Mrs. Vasanti Joshi
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Project Coordinator:

Dr. Madhavi Kulkarni, Vice Principal and Associate Professor of Commerce

Associates:

Dr. Manasee Rajhans, Head and Associate Professor of Psychology

Mrs. Vasanti Joshi, Associate Professor of Commerce

Contact Mobile No: 9422525299

Email address: madhaviskulkarni@gmail.com

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1. Introduction

This study is undertaken with a view to identifying the reasons behind the declined number of suicide cases in Pune during COVID 19 lockdown. During lockdown of COVID 19 between March and July 2020, it is experienced that the number of suicide cases in Pune has declined. This fact possibly is associated with any or all of the following causes:

1. The probable victim did not get opportunity to make suicide attempt;
2. The probable victim got necessary Psychological support from family members to overcome depressive mood;
3. The fear of COVID 19 pandemic engrossed all other depression generating fears and worries;
4. The tightened policing and social patrolling made it difficult to attempt suicide.

There are push and pull factors affecting both the situations under which suicide attempts are made and the causes of suicide.

The review of literature for this project focuses mainly on research reports on assessment of suicide cases in India and abroad. It aims at identifying main factors or causes of suicide attempts; and, establishing their associations with age, gender, and economic status of the victims. It is undertaken with a view to identifying suitable methodology; and, deriving at a set of variables to be studied.

In a report by India State-Level Disease Burdon Initiative Collaborators (2018)[1], trends of suicide deaths and the heterogeneity in its distribution between the States of India from 1990 to 2016 were studied. Ten common causes identified in this research were illness, family problems, financial loss, alcoholism, unemployment, poverty, love/affairs, failure in examination, dowry and cancellation/non settlement of marriage. The study recommended development of Suicide Prevention Strategy in India.

Kirtee Kamalja and Nutan Khanaar in their research paper published in Egyptian Journal (2017)[2] referred to leading risk factors for suicidal tendency as financial problems, illness, drug, and failure in examination. Common methods observed, considering gender, were hanging and poisoning both by male and female; Firearm / self-immolation preferred by female; and, drowning preferred by Male.

Dr. Laxmi Vijaykumar, the founder trustee of NGO working for suicide prevention, in her research article (2015)[3], studied suicide behaviour of women from developing countries, using the mortality statistics available on the website of WHO, and Human Development Indices (HDI) of different categories of countries. It is found in this study that greater number in suicide cases of women is likely due to gender related vulnerability and psychological stresses.

In the research paper which was the part of the Global Burdon of Diseases, Injuries and Risk Factor (GBD 2016)[4], published in the Lancet the researcher Rakhi Dandona and her colleagues studied suicide rates in India since 1990. The suicide rate in India was not only was found to be higher than the global average but also showed significant rise due to consumption of alcohol in men; and, being widow, separated, or divorced were associated with risk of suicide in women.

Mr. Shuvabrata Garai concludes in his report, based on The NCRB data, published in the Hindu (January 2020)[5] that the rate of suicide cases has increased in 2018; and, every hour one student commits suicide in India. Dr Era Dutta, in a report published in The Lancet (2018)[6] states that depression, lack of fulfillment of expectation, failed relationships, sexual abuse and harassment, bulling and particularly Cyber bulling, traumatic events related to self-respect, and post-marriage adjustments issues are the main causes that may contribute to thoughts of suicide in case of Indian Women.

With reference to analysis of the data from National Crime Records Bureau (NCRB), Professor Nilotpal Kumar in his report (2017)[7] states that the reasons for men committing suicide are family issues, debt, unemployment, and consumption of alcohol. John Snowdon, in his research paper published in Indian Journal of Medical Research (2019)[8], studied causation of suicide, differences in rates and patterns between genders, across the age-range; and suicide intentions. The findings of this study indicate that the young and the old-age are the key risk periods for women; whereas, young adulthood, middle-age and old-age are the key risk periods for men. Associations were also developed based on gender, age and cause; and, gender, age and means of suicide.

2. Objectives and Methodology

This study is based on the factual information about the suicide cases registered in Pune during time span of March to July in two consecutive years 2019 and 2020. It follows deductive approach of research to explain causal relationships between declined number of suicide cases and lockdown phenomena by analyzing the record of suicide cases registered in this period. The study has tried to test the association of reasons with gender, age, and economic condition of victims.

It is undertaken in the following steps:

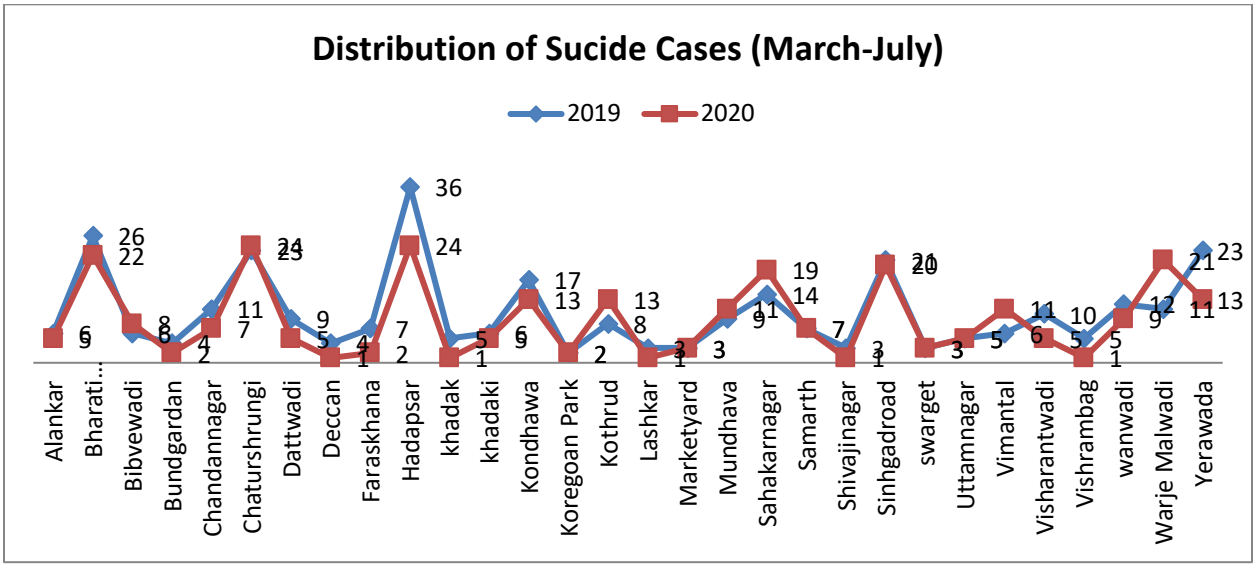
1. A set of causes of suicidal tendency are derived from the existing research database and historical police record.
2. The suicide cases registered during March and April 2020 are classified on the basis of reasons and means of suicide.
3. Statistical correlations between reasons and means of suicide with gender, age and economic condition of the victims are assessed.
4. Significance of associations of reasons, means, gender, age, and economic conation of victims with the lockdown situation is tested to establish causal relationship.
5. A set of the reasons not registered during the COVID 19 Lockdown period is derived.

3. Findings

3.1 Descriptive Statistics

The following table gives the information about the suicide cases registered in different police stations of Pune city during March to July, 2019 and 2020.

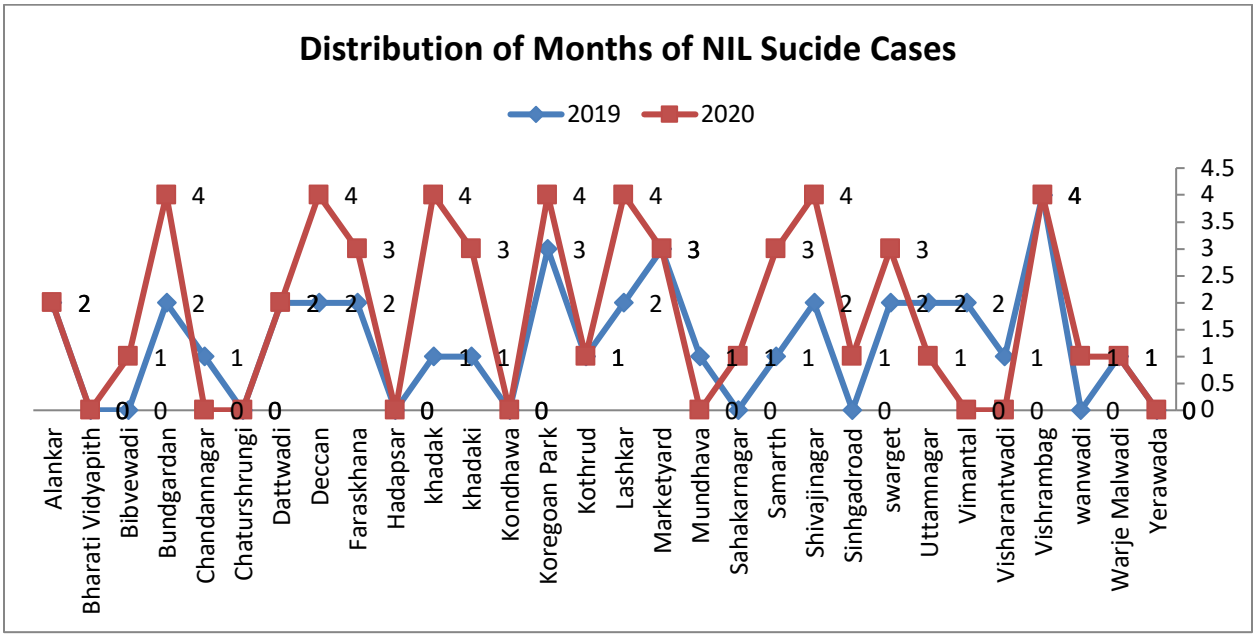
Police Station	2019		2020	
	Total	NIL Months	Total	NIL Months
Alankar	6	2	5	2
Bharati Vidyapith	26	0	22	0
Bibvewadi	**6**	0	**8**	1
Bundgardan	4	2	2	4
Chandannagar	11	1	7	0
Chaturshrungi	**23**	0	**24**	0
Dattwadi	9	2	5	2
Deccan	4	2	1	4
Faraskhana	7	2	2	3
Hadapsar	36	0	24	0
khadak	5	1	1	4
khadaki	6	1	5	3
Kondhawa	17	0	13	0
Koregoan Park	2	3	2	4
Kothrud	**8**	1	**13**	1
Lashkar	3	2	1	4
Marketyard	3	3	3	3
Mundhava	9	1	11	0
Sahakarnagar	**14**	0	**19**	1
Samarth	7	1	7	3
Shivajinagar	3	2	1	4
Sinhgadroad	21	0	20	1
swarget	3	2	3	3
Uttamnagar	5	2	5	1
Vimantal	**6**	2	**11**	0
Visharantwadi	10	1	5	0
Vishrambag	5	4	1	4
wanwadi	12	0	9	1
Warje Malwadi	**11**	1	**21**	1
Yerawada	23	0	13	0
Total	**305**		**264**	



The number suicide cases registered during the period under this study has declined from 305 to 264; it means the suicide cases registered during lockdown has declined by nearly 13.44%. It is found that the number of suicide cases registered has shown a decline; with exception of a couple of police stations where number has remained constant. Only in one police station the number of suicide cases registered has increased significantly.

3.1.1 Police Station-Wise Distribution of NIL Suicide Cases

The following graph gives information about number of months with NIL suicide cases reported by different police stations during the months under this study. It shows that in all the police stations the number of months with NIL suicide cases has increased.

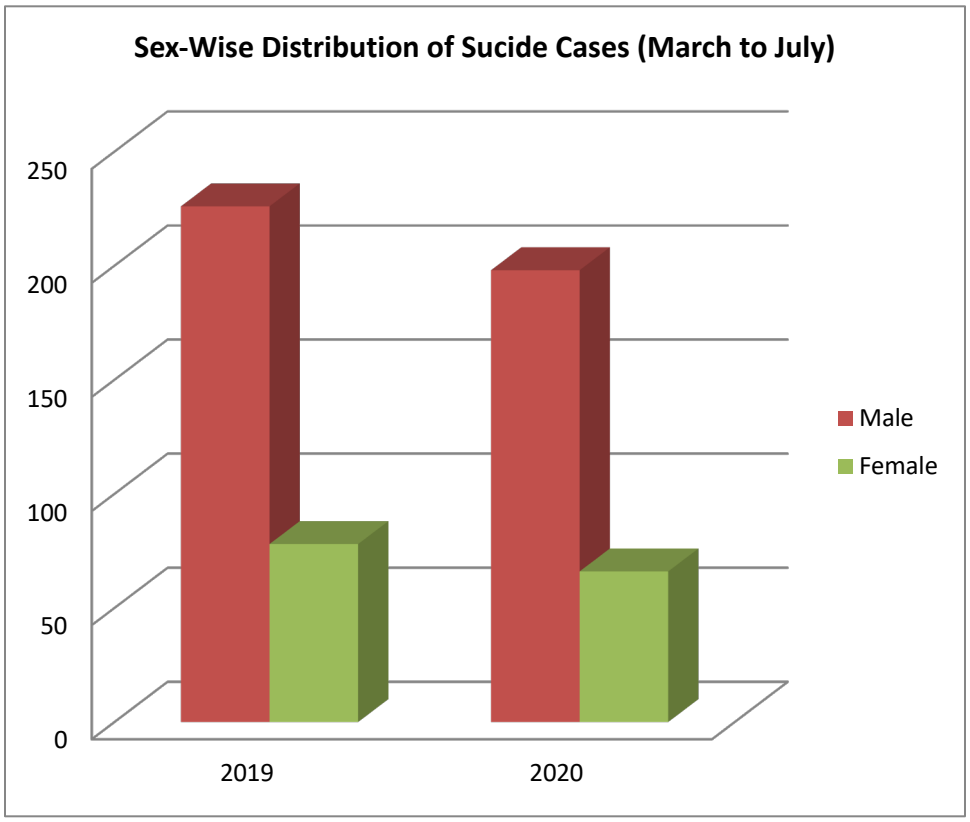


Statistical Measure	2019		2020	
	Cases	Months with NIL Suicide Case	Cases	Months with NIL Suicide Case
Minimum	2	0	1	0
Maximum	**36**	4	**24**	4
Average	**10**	1	**9**	2
Mode	**6**	2	**5**	0

All the statistical parameters in the above table show a decline in the year 2020.

3.1.2 Gender-Wise Distribution of Suicide Cases

Sex	2019	2020
Male	226	198
Female	78	66
Transgender	1	0
Total	305	264



The total number of cases has declined due to decline in number of suicide cases of both male and female victims.

Age-Wise Distribution of Suicide Cases Registered

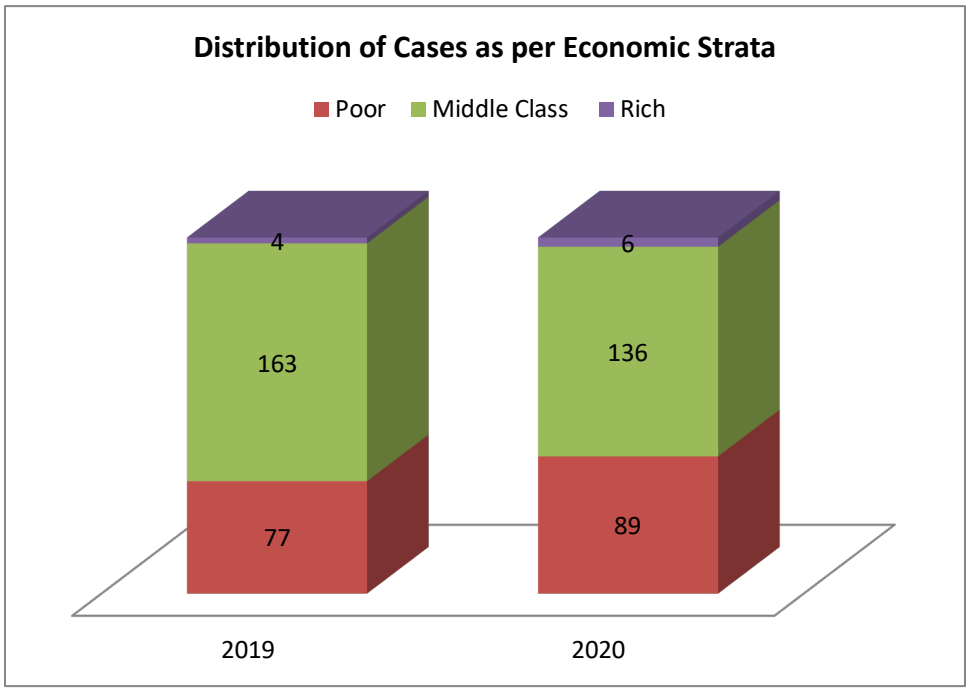
Age Group	2019-20	2020-21
0-20	32	29
20-40	179	160
40-60	60	53
60-80	18	15
80-100	3	2
No Information	13	5
Total	305	264

The number of suicide cases registered during March and July 2020 in all the age groups has declined.

3.1.3 Economic Strata-Wise Distribution of Suicide Cases Registered

The following table and graph show that the number of suicide cases registered in poor class and rich class has increased as against a considerable decline in case of middle class.

Economic Strata	2019	2020
Poor	77	89
Middle Class	163	136
Rich	4	6
No Information	74	33
Total	305	264



3.1.4 Other Demographic Descriptions

The following two tables give the distribution of suicide cases registered during the period of study on the basis of the sources of income of the victims and number of their family members. In case of these demographic parameters also, it is found that the number of cases registered during Lockdown period has declined in all the categories.

Source of Income	2019	2020
Unemployed	58	41
Household	30	24
Education	26	20
Service	75	78
Self-Employed	30	21
No Information	86	80
Total	305	264

Number of Family Members	2019	2020
0	2	6
1	6	10
2	9	26
3	39	48
4	66	26
5	33	8
6	7	1
7	1	0
No Information	142	139
Total	305	264

All the above descriptions clearly indicate that the there is decline in the number suicide cases registered during COVID 19 Lockdown. This decline is experienced in respect to all demographic parameters like gender, source of income, economic strata of the victims and number of family members.

3.2 Correlation analysis

- A very high positive correlation between the cases registered in different police stations during March to July in the two years under the study is found, with coefficient of correlation 0.85.
- A positive correlation with coefficient 0.69 is found between the number of months with no suicide cases registered in the years 2019 and 2020 in different police stations of Pune city.
- No significant correlation is found between the gender, age, economic status, reasons and means of suicide, in the years 2019 and 2020 registered in different police stations of Pune city.

From the above discussion about the correlations it can be concluded that the decline in the number of suicide cases registered in different police stations shows a positive relationship with the police stations. It means that the proportion decline of cases registered in different police stations remains same during the consecutive years 2019 and 2020.

The following section narrates the results of the Chi Square tests carried on the data for establishing the statistical significance of association between the decline in number of suicide cases registered in Pune and different parameters used in this study.

3.3 Inferential Statistics

3.3.1 Significance of Difference relating to Number of Suicide Cases

The result of the chi square test applied for establishing the significance of the decline in cases filed with different police stations during the period of two years under this study shows that there is significant difference in the number of cases filed in different police stations during the period under study of the two years 2019 and 2020. It means the decline in the number of suicide cases is statistically significant.

3.3.2 Significance Difference relating to Number of Months with NIL Suicide Cases

The chi square test applied to the number of months with nil suicide cases during the period of study in two years also proves that the number of such months with nil suicide cases in 2020 is significantly more as compared to 2019.

After establishing the statistical significance of difference in the two years in two aspects, namely, number of cases and number of months with nil suicide cases, the following tests were applied for identifying the areas and aspects relating to suicide cases wherein this difference can be located.

3.3.3 Significance of Gender-Wise Difference

The calculated value of chi square (0.04) accepts the null hypothesis that the gender-distribution of suicide cases has no association with the years of registration. It means that the proportion of male and female suicide cases in the years 2019 and 2020 are not statistically different.

3.3.4 Significance of Age-Wise Difference

The calculated value of chi square (0.06) accepts the null hypothesis that the age-wise distribution of suicide cases has no association with the years of registration. It means that there is no significant difference in age-wise distribution of suicide cases in the years 2019 and 2020.

3.3.5 Significance of Source of Income-Wise Difference

The calculated value of chi square (3.00) accepts the null hypothesis that there is no significant difference distribution of suicide cases registered in the years 2019 and 2020 as far as sources of income of the victims are concerned.

3.3.6 Significance of Difference on the basis of number of family members

The calculated value of chi square (105.44) proves that there is association of number of family members with the year of registration. It means there is significant change in the proportions of

suicide cases registered on the basis of number of family members of victims. Higher the number of family members higher is the decline in the suicide cases.

3.3.7 Significance of Difference on the basis of Cause of Suicide

The following table gives distribution of suicide cases on the basis of causes with the years under this study. The calculated value of chi square (1.31) accepts the null hypothesis that the reasons of suicide have no association with the years of registration. It means reasons of suicide are not associated with the year of the registration.

19-20	Reasons	20-21
40	**Illness**	**29**
77	**Domestic Disputes**	**42**
10	**Love Affair**	**05**
45	**Addiction**	**33**
12	**Financial Problems**	**09**
60	**Depression**	**38**
61	No Reason Identified	**108**
305	**Total**	**264**

3.3.8 Significance of Difference on the basis of Means of Suicide

The following table gives distribution of suicide cases on the basis of means of suicide used by the victims with the years under this study. The calculated value of chi square (0.00) accepts the null hypothesis that the means of suicide have no association with the years of registration. It suggests that the means of suicide are not associated with the year of the registration.

19-20	Means of Suicide	20-21
221	Hanging	**103**
20	Use of Poison	**7**
5	Drowning in water	**3**
9	Self Injuring	**5**
14	Jumping from Height / under speeding vehicle	**7**
2	Self Burning	**1**
271	Total	**126**

From the above results, it is found that the significant decline in the suicide cases during lockdown period of 2020 has no association with any of the variables like gender, age, source of income, reason of suicide, and means of suicide; except, with the number of family members.

4. Conclusions

1. All the statistical parameters indicate that there is decline in the number of suicide cases registered in Pune during COVID 19 Lockdown.
2. This decline is found proportionate with the cases registered in different police stations during March- July 2019.
3. The decline in suicide cases registered is experienced in respect to all demographic parameters like gender, source of income, economic strata of the victims and number of family members.
4. As far as gender, age, economic status, reasons and means used by suicide victims are concerned, the decline in the suicide cases is found proportionate, except for number of family members.
5. As far as, reasons and means of suicide used by victims are concerned, there is no association found with the years of registration.
6. There is significant decline in suicide cases due to illness, love affairs and addiction.
7. Hanging is found to be most used means of suicide; self injuring, burning, and consuming poison are less used means of suicide during Lockdown.

To sum up, it can be concluded that in the COVID 19 lockdown the suicides in Pune have shown a significant decline. However, no associations of this decline can be established with age, gender, source of income and economic status of the victims. The main factors or causes of suicide attempts and means used also have no significant association with the decline. By logic of elimination, it can be inferred that the decline has direct association with the lockdown and COVID 19 phenomenon.

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6. Annexure: Chi Square Test Tables

6.1.1 Significance of Difference by Number of Cases

Police Station	Number of Suicide Cases Filed				
	O	E	(O-E)	$(O-E)^2$	$(O-E)^{2/}E$
Alankar	5	6	-1	1	0.2
Bharati Vidyapith	22	26	-4	16	0.6
Bibvewadi	8	6	2	4	0.7
Bundgardan	2	4	-2	4	1.0
Chandannagar	7	11	-4	16	1.5
Chaturshrungi	24	23	1	1	0.0
Dattwadi	5	9	-4	16	1.8
Deccan	1	4	-3	9	2.3
Faraskhana	2	7	-5	25	3.6
Hadapsar	24	36	-12	144	4.0
khadak	1	5	-4	16	3.2
khadaki	5	6	-1	1	0.2
Kondhawa	13	17	-4	16	0.9
Koregoan Park	2	2	0	0	0.0
Kothrud	13	8	5	25	3.1
Lashkar	1	3	-2	4	1.3
Marketyard	3	3	0	0	0.0
Mundhava	11	9	2	4	0.4
Sahakarnagar	19	14	5	25	1.8
Samarth	7	7	0	0	0.0
Shivajinagar	1	3	-2	4	1.3
Sinhgadroad	20	21	-1	1	0.0
swarget	3	3	0	0	0.0
Uttamnagar	5	5	0	0	0.0
Vimantal	11	6	5	25	4.2
Visharantwadi	5	10	-5	25	2.5
Vishrambag	1	5	-4	16	3.2
wanwadi	9	12	-3	9	0.8
Warje Malwadi	21	11	10	100	0.0
Yerawada	13	23	-10	100	1.0
				Chi Square	**39.5**

6.1.2 Significance of Difference by Months with NIL Suicide Report

Police Station	Police stations with NIL Suicide Report				
	O	E	(O-E)	$(O-E)^2$	$(O-E)^{2/}E$
Alankar	2	2	0	0	0.0
Bharati Vidyapith	0	0	0	0	
Bibvewadi	1	0	1	1	0.0
Bundgardan	4	2	2	4	2.0
Chandannagar	0	1	-1	1	1.0
Chaturshrungi	0	0	0	0	
Dattwadi	2	2	0	0	0.0
Deccan	4	2	2	4	2.0
Faraskhana	3	2	1	1	0.5
Hadapsar	0	0	0	0	
khadak	4	1	3	9	9.0
khadaki	3	1	2	4	4.0
Kondhawa	0	0	0	0	
Koregoan Park	4	**3**	1	1	0.0
Kothrud	1	1	0	0	0.0
Lashkar	4	2	2	4	2.0
Marketyard	3	3	0	0	0.0
Mundhava	0	**1**	-1	1	1.0
Sahakarnagar	1	0	1	1	
Samarth	3	1	2	4	0.0
Shivajinagar	4	2	2	4	0.0
Sinhgadroad	1	0	1	1	1.0
swarget	3	2	1	1	2.0
Uttamnagar	1	2	-1	1	3.0
Vimantal	0	2	-2	4	4.0
Visharantwadi	0	1	-1	1	5.0
Vishrambag	4	4	0	0	6.0
wanwadi	1	0	1	1	7.0
Warje Malwadi	1	1	0	0	8.0
Yerawada	0	0	0	0	9.0
				Chi Square	**66.5**

6.1.3 Significance of Difference by Gender

O	E	(O-E)	$(O-E)^2$	$(O-E)^2/E$
226	227	-1	1	0.00
78	77	1	1	0.01
198	197	1	1	0.01
66	67	-1	1	0.01
			Chi Square	**0.04**

6.1.4 Significance of Difference by Age

O	E	(O-E)	$(O-E)^2$	$(O-E)^2/E$
32	32	0	0.15	0.00
179	180	-1	1.00	0.01
60	60	0	0.04	0.00
18	17	1	0.28	0.02
29	29	0	0.15	0.01
160	159	1	1.00	0.01
53	53	0	0.04	0.00
15	16	-1	0.28	0.02
			Chi Square	**0.06**

6.1.5 Significance of Difference by Income

O	E	(O-E)	$(O-E)^2$	$(O-E)^2/E$
58	54	4.20	17.65	0.33
30	29	0.66	0.43	0.01
26	25	1.00	1.00	0.04
75	83	-8.14	66.32	0.80
30	28	2.29	5.22	0.19
41	45	-4.20	17.65	0.39
24	25	-0.66	0.43	0.02
20	21	-1.00	1.00	0.05
78	70	8.14	66.32	0.95
21	23	-2.29	5.22	0.22
			Chi Square	**3.00**

6.1.6 Significance of Difference by Number of Family Members

O	E	(O-E)	$(O-E)^2$	$(O-E)^{2/}E$
17	42	-25	641.41	15.15
39	62	-23	548.17	8.78
66	52	14	199.11	3.84
41	29	12	149.70	5.20
42	17	25	641.41	38.47
48	25	23	548.17	22.30
26	40	-14	199.11	4.96
10	22	-12	149.70	6.73
			Chi Square	**105.44**

6.1.6 Significance of Difference by Reason of Suicide

O	**E**	**O-E**	**$(O-E)^2$**	**$(O-E)^2/E$**
40	42	-2.09	4.37	0.10
77	73	4.41	19.45	0.27
45	48	-2.58	6.66	0.14
60	60	0.22	0.05	0.00
22	22	0.04	0.00	0.00
29	27	2.09	4.37	0.16
42	46	-4.41	19.45	0.42
33	30	2.58	6.66	0.22
38	38	-0.22	0.05	0.00
14	14	-0.04	0.00	0.00
			Chi Square	**1.31**

6.1.6 Significance of Difference by Means of Suicide

O	**E**	**O-E**	**$(O-E)^2$**	**$(O-E)^2/E$**
221	221.17	-0.17	0.03	0.00
103	102.83	0.17	0.03	0.00
50	49.83	0.17	0.03	0.00
23	23.17	-0.17	0.03	0.00
			Chi Square	**0.00**
