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Original Research Article

ANALYSIS OF RISK FACTORS OF SUICIDAL DEATH: A NORTHERN INDIA CASE CONTROL STUDY

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Abstract

Background: Suicide is a major public health problem, and its number is continuously rising in India. This study is conducted to examine the various aspects responsible of suicide. **Materials and Methods:** the hospital based case control study was conducted at department of Forensic Medicine & Toxicology of GSVM Medical College, Kanpur, U.P. which is a tertiary care teaching Hospital chiefly catering to demands of Kanpur and adjacent districts of Uttar Pradesh. This is a comprehensive study of one year extending from 1st July, 2021 to 30th June, 2022. During the study total autopsies 3976 conducted. Out of which 720 cases were taken in the study. **Results:** Outcomes of present study shows that maximum numbers of victims are male from age group of 20 to 30 years. Further major risk factors are urban habitat, low education and poor economic condition. Moreover family problems, depression, psychiatric illness and drug abuse history is responsible for majority of suicide cases. House wives and married persons are at higher risk to commit suicide. **Conclusion:** Potential risk factors responsible of suicide are identified in population under investigation. Further, results of study is helpful to design and implementation of potential remedial measure.

INTRODUCTION

Suicide poses a significant public health challenge, comprising 1.4% of all deaths with a mortality rate of 10.5 per 100,000 worldwide.[1] India has witnessed a consistent rise in suicide rates over the past five decades. In 2021, suicides surged by 7.2% compared to 2020, and the country reported the highest number of suicides globally. India's contribution to global suicide deaths has also increased, from 25.3% in 1990 to 36.6% in 2016 among women, and from 18.7% to 24.3% among men. Alarmingly, suicide was the leading cause of death among both age groups of 15-29 years and 15-39 years in 2016.[2] Between 1987 and 2007, the suicide rate rose from 7.9 to 10.3 per 100,000, with the southern and eastern states of India experiencing higher suicide rates. Daily wage earners accounted for the largest group in the suicide data, registering 42,004 deaths by suicide in 2021. The situation underscores the need for urgent and comprehensive measures to address the root causes of the rising trend in suicide rates in India.[3] However, the actual significance of suicide goes beyond its apparent prevalence due to its unique characteristics that differentiate it from other major causes of death. One distinguishing feature of suicide is its direct and immediate causation, as it results from a person's voluntary behavior.[4, 5] This visible causation based on an individual's choice enables focused efforts for prevention. Another unique aspect is that suicide disproportionately affects young and middle-aged people, leading to a heavier burden of potential life lost.[6] Additionally, suicide can be contagious, with its emotional aftermath leaving a strong and long-lasting impact, which may result in additional victims. Further, suicide is a matter of self-determination for life and death, ultimately relating to the dignity of life. In summary, suicide is not just a matter of statistics but a complex issue that requires a comprehensive approach to prevention and treatment.[7, 8] Suicide serves as an indicator of both an individual's mental health and the societal context in which they live. It is closely linked to an overwhelmingly negative perception of oneself and the world around them.[9] This negative perception may stem from intrinsic factors such as mental

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illness or from extrinsic conditions such as poor physical health, personal misfortunes, and adverse social circumstances. Often, these intrinsic and extrinsic factors are interrelated.[10] As such, suicide research aims to answer two fundamental questions: who is most likely to die by suicide, and what factors contribute to their decision to do so. By understanding the complex web of factors that lead to suicide, we can develop more effective prevention and intervention strategies to address this critical public health concern.[11, 12]

Suicide has been extensively researched both at the individual and population levels. In population-based studies, demographic factors such as age and sex, as well as socioeconomic events like economic crises, have been the primary focus in identifying populations at risk of suicide.[13,14] However, the significant variation in suicide rates among countries demonstrates that suicide cannot be solely attributed to simple demographics or temporary social events.[15,16] It is critical to consider regional characteristics that encompass socio-cultural elements to gain a more comprehensive understanding of suicide. Population-level analyses that incorporate these elements can offer insights into the less explored factors contributing to suicide.[17] By examining the impact of socio-cultural factors, we can gain a more nuanced understanding of the complex web of factors that influence suicide rates. This approach can inform the development of tailored and effective suicide prevention strategies that address the unique characteristics and needs of different populations.[18, 19] Suicidal behavior has numerous underlying causes that often go unnoticed. The factors that contribute to suicide risk are multifaceted and interrelated. Identifying these factors and comprehending their roles in suicidal behavior are essential for effective suicide prevention.[20] Individuals diagnosed with mental health conditions are at an increased risk of attempting and completing suicide.[21] Studies have revealed that over 90% of suicides and suicide attempts are linked to psychiatric disorders. Depressive disorders, in particular, are associated with the highest rates of suicide globally.[22] By acknowledging the link between mental health and suicide risk, we can better support individuals with mental health conditions and provide them with the necessary interventions and resources to mitigate suicide risk.[23] Additionally, addressing the underlying social and cultural factors that contribute to mental health conditions and suicidal behavior can help prevent suicide at a broader societal level.[24] A comprehensive understanding of the factors that contribute to suicidal behavior is essential for clinicians, psychologists, family members, and social health activists working to prevent suicide and reduce stigma surrounding it.[25] By identifying and predicting the individuals who are vulnerable to suicide attempts and addressing the risk factors that promote suicidal ideation, we can effectively prevent suicide.[26] Examining the relationship between various psychiatric illnesses, such as depression, stress, alcohol withdrawal syndrome, bipolar disorder, and schizophrenia, and suicide attempts can help clinicians provide proper preventive care and counseling to at-risk individuals.[27] Additionally, understanding the common methods of suicide attempts can aid in taking precautionary measures to prevent such attempts. Furthermore, associating the level of intent with the mode of suicide attempt can provide insights into whether the individual attempted suicide as a cry for attention or with the intention to die.[28] This understanding can guide counseling efforts and prevent future suicide attempts. Overall, a comprehensive understanding of the complex factors contributing to suicidal behavior can inform effective prevention strategies and support efforts to reduce the stigma surrounding suicide.[28, 29]

The suicide rate in the Kanpur Region has not been extensively studied, particularly in the context of its distinct cultural norms compared to the western world and other regions of India. Therefore, it is crucial to determine the risk factors for suicide in this population, specifically related to socio-demographic characteristics, family background, and stressful life events, physical and psychiatric health. It is unclear whether risk factors identified in western studies are applicable universally to the population in the Kanpur Region. Thus, the goal of this study is to identify the factors associated with suicide rates among individuals residing in and around the Kanpur Nagar District of Uttar Pradesh, located in the heart of the northern Gangetic plains of India.

MATERIALS AND METHODS

This prospective study "Pattern of suicidal death in Kanpur Nagar" carried out in the Department of Forensic Medicine & Toxicology of GSVM Medical College, Kanpur, U.P. which is a tertiary care teaching Hospital chiefly catering to demands of Kanpur and adjacent districts of Uttar Pradesh.

This is a comprehensive study of one year extending from 1st July, 2021 to 30th June, 2022. During the study total autopsies 3976 conducted. Out of which 720cases were taken in the study. Collection of data includes questionnaires schedule recorded on preformed pro-forma and interview sessions at the time of autopsy with the concerned investigating officer, parents of the victim, other family members and relatives of the victim, neighbor's and other persons accompanying the deceased. Data also collected from police inquest, post-mortem register and reports, hospital memos in hospitalized cases, death certificate if hospital death is there, suicide notes/other relevant reports etc.[30]

Statistical Analysis

All the collected data has been compiled and statistically analyzed in the form of percentage,

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pictograms, and pie-charts. On the bases of analysis results were drawn, discussed and compared with other relevant studies. And after that summary and conclusion were drawn.

General overview of the materials and methods for each analysis technique are provided as following;

Trend Analysis: Identify the variable of interest and collect data on the variable over time Use R software to perform trend analysis, such as regression analysis or time-series analysis, to identify patterns or trends in the data.

Correlation: Collect data on two variables of interest then Use statistical software to perform correlation analysis, such as Pearson's correlation or Spearman's rank correlation, to measure the strength and direction of the relationship between the variables.

Chi-square: Collect categorical data on two or more variables of interest then Use R programming software to perform chi-square analysis to determine if there is a significant association or difference between the variables.

One-way ANOVA: Collect continuous data on one variable of interest and categorical data on one or more grouping variables then Use R programming software to perform one-way ANOVA to determine if there is a significant difference in the means of the variable of interest across the groups.

Post-hoc Tukey HSD test: Use R programming software to perform post-hoc Tukey HSD test following a significant one-way ANOVA result to determine which specific groups have significant differences in means.

Fisher's exact test: Collect categorical data on two variables of interest then used R programming software to perform Fisher's exact test to determine if there is a significant association or difference between the variables, particularly when sample sizes are small.

Cluster analysis: Collect data on multiple variables of interest then Use R programming software to perform cluster analysis to group similar observations or variables based on their characteristics or attributes.

Bar plot: Use R programming software to create a bar plot, a visual representation of the data where the height of the bars represents the frequency or mean of a variable of interest for each category or group.[31-34]

Exclusion criteria

1. Body brought to the mortuary due to any other cause /where cause cannot be determined.
2. Any doubtful cases where Panchnama is not clear.
3. Any obscure or negative autopsy.

RESULTS

In present study data presented in [Figure 1(A)] shows the age wise distribution of victims. The percentage of <20 years, 20 to 30 years, 31 to 45 years, 46 to 60 years and >60 years were 12.50%, 41.67%, 31.94%, 11.11%, and 2.78%, respectively. Moreover, the victims were commonly (73.61%) belong to 20-45 years age group. [Figure 1(B)] shows the victims gender wise distribution. Out of 720, total 445 (61.81%) victims were male and 275 (38.19%) victims were female. [Figure 1 (C)] shows the distribution of victims according to different age group with gender wise. The percentage of <20 years, 20 to 30 years, 31 to 45 years, 46 to 60 years, and >60 years age group were 12.36%, 30.34%, 35.96%, 15.73%, 5.62%, in male and 14.55%, 58.18%, 23.64%, 1.82%, 1.82% in female, respectively. [Figure 1 (D)] shows the religion wise prevalence of victims. Out of 720, total 665 (92.36%) victims were Hindu, 45 (6.25%) victims were Muslim and 10 (1.39%) victims were other religion.

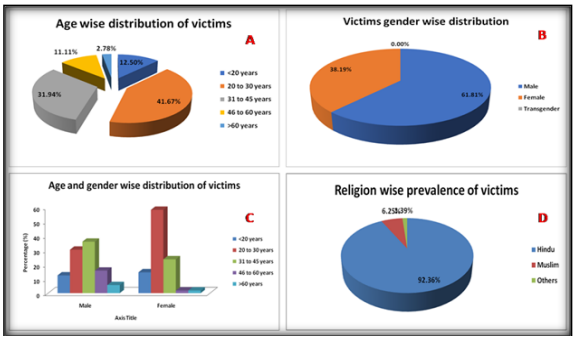

Figure 1: (A) Age wise distribution of victims (B) Victims gender wise distribution (C) Age and gender wise distribution of Victims (D) Religion wise prevalence of victims

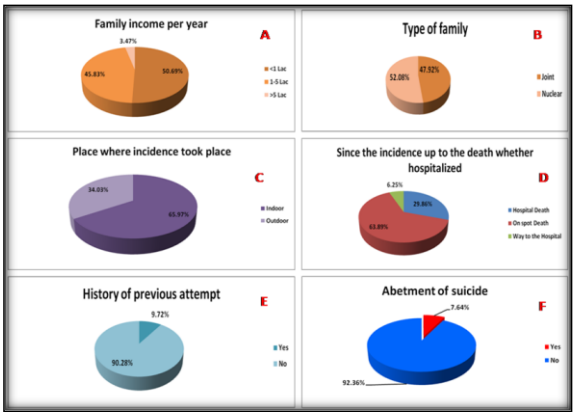

Figure 2: (A) Family income per years (B) Type of family (C) Place where incidence took place (D) Since the incidence up to the death whether hospitalized (E) History of previous attempt (F) Abetment of suicide

In present investigation [Figure 2(A)] shows the distribution of victims according to Family income per year. Out of 720, total 365 (50.69%) victims family income were < l lac, 330 (45.83%) were 1-5 lac and 25 (3.47%) were >5 lac. Moreover, the suicidal tendency was more common in lower income group in study population. [Figure 2(B)] shows the distribution of victims according to type of family. Out of 720, total 345 (47.92%) victims

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family were joint and 375 (52.08%) victims family were nuclear. Moreover, the suicidal tendency was slightly more in nuclear family. [Figure 2(C)] shows the distribution of victims according to place where incidence took place. Out of 720, total 475 (65.97%) victims incidence were took place at indoor and 245 (34.03%) victims incidence were took place at outdoor. Moreover, the suicidal tendency was commonly more in indoor place. [Figure 2(D)] shows since the incidence whether the victim was Hospitalized or died on the spot or while going to the hospital. The percentage of hospital death, on spot death and way to the hospital were 29.86%, 63.89% and 6.25%, respectively. [Figure 2 (E)] shows relatives gave the history whether they attempted suicide earlier or not. Out of 720, total 70 (9.27%) relatives gave the history whether they attempted suicide earlier. [Figure 2 (F)] shows the abetment of suicide. Out of 720, total 55 (7.64%) shows the abetment of suicide.

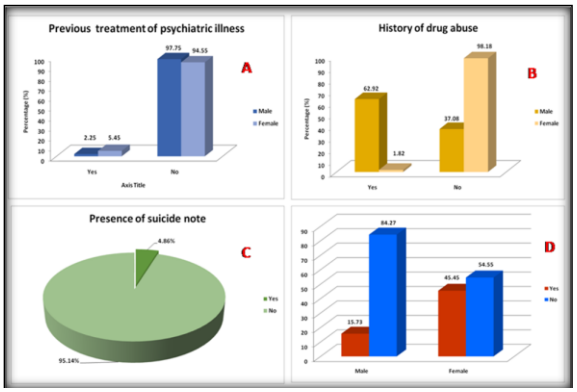

Figure 3: A) Previous treatment psychiatric illness (B) History of drug abuse (C) Presence of suicide note (D) Variation in History according to the Police/Relative

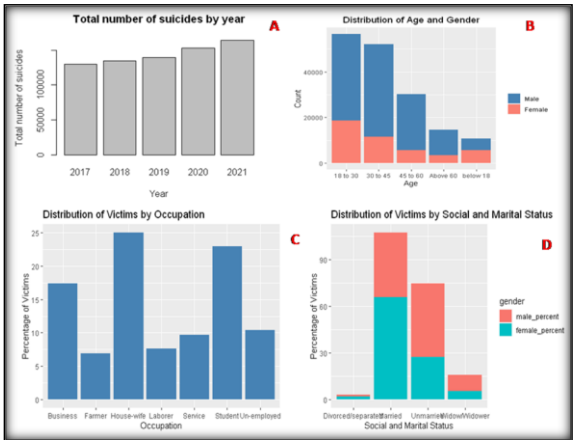

Figure 4: (A) Total number of suicides by year (B) Distribution of cases by age and gender (C) Distribution of victim by occupation (D) Distribution of victims by social and marital status

[Figure 3(A)] showing whether victims had previous psychiatric illness treatment or not, and analysis shows that 2.25% of males and 5.45% of females have under psychiatric illness treatment. Analysis of data represented in figure 3(B) shows that 62.92% of males and 1.82% of females have a history of drug abuse. 4.86% of cases show the presence of suicide note as shown in [Figure 3(C)]. 15.73% of males and 45.45% female cases show variation in history according to the Police/Relative as represented in [Figure 3(D)].

The result of the Pearson's chi-squared test for on the age data shows a test statistic (X-squared) of 6211.1 with 4 degrees of freedom and a p-value less than 2.2e-16. The p-value is less than the commonly used significance level of 0.05, which suggests strong evidence against the null hypothesis. Therefore, we can conclude that there is a significant association between age and gender in terms of the number of people in each age group and gender category.

[Figure 4 (A)] represented the number of suicide by years and data represent that the suicide cases are continuously increasing. The plot appears to be a clustered bar chart comparing the number of males and females in each age group. The x-axis represents the age groups, while the y-axis shows the count of individuals. The blue bars represent the number of males, while the pink bars represent the number of females [Figure 4(B)]. From the plot, we can see that the largest age group is 30-45, with both males and females having the highest count in this group. The second largest age group is 18-30, followed by 45-60, above 60, and below 18. Additionally, we can see that the number of males is generally higher than the number of females in each age group, except for the below 18 age group, where the number of females is slightly higher.

The chi-square test of independence was performed on a contingency table that categorized individuals based on their habitat (Urban, Semi urban, Rural) and gender (Male, Female). The test resulted in a chi-square statistic of 19.503 with 2 degrees of freedom and a very low p-value of 5.82e-05.

It seems that there is a significant association between habitat type and gender of the victims. The p-value of the test is less than 0.05, which indicates that we can reject the null hypothesis of independence and conclude that there is a significant relationship between the two variables. In the semi-urban habitat, there are more males than expected and fewer females than expected, while in the rural habitat, there are more females than expected and fewer males than expected.

The chi-square test of independence was performed on a contingency table that categorized individuals based on their education level (Illiterate, up to VIII, X, XII, Graduate and others) and gender (Overall, Males, Females). The test resulted in a chi-square statistic of 97.472 with 8 degrees of freedom and an extremely low p-value of less than 2.2e-16.

This indicates that there is a highly significant association between education level and gender among the individuals in the study. In other words, the proportion of males and females in each education category is not equal and there may be underlying factors that contribute to this association.

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From the bar chart, we can see that the highest percentages of victims are housewives, followed by students and business people as show in [Figure 4(C)]. The lowest percentages of victims are farmers, laborers, and service workers. If housewives are found to be at a higher risk of victimization, measures could be taken to increase their safety, such as providing education and resources on self-defense or improving access to support services.

The output will be a stacked bar chart that shows the percentage of victims by social and marital status and gender. The chart allows us to compare the distribution of victims between males and females within each social and marital status category as show in [Figure 4(D)]. Fisher's exact test was conducted to determine whether there is a significant association between the cause of death and gender. The test compares the observed frequency distribution in the contingency table to the expected distribution under the assumption that there is no association between the cause of death and gender. The output of Fisher's exact test shows a p-value of <0.001, indicating that there is a statistically significant association between the cause of death and gender. Therefore, the distribution of causes of death is not the same for males and females. The Pearson's Chi-squared test that you performed indicates that there is a significant association between gender and motive for suicide. The test statistic is X-squared = 206.91 with 12 degrees of freedom, and the p-value is < 2.2e-16, which is much smaller than the conventional level of significance of 0.05. This means that the observed distribution of motives for suicide is unlikely to occur by chance alone, assuming that there is no association between gender and motive for suicide. In other words, gender and motive for suicide are not independent, and there is evidence to suggest that the two variables are related.

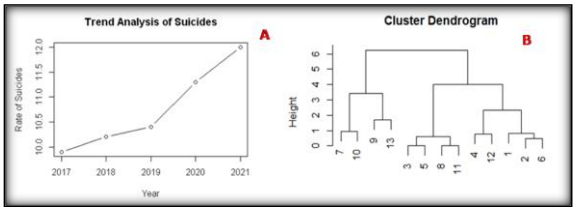

Figure 5: (A) Visualize the trend of suicide rates over time (B) Dendrogram shows the hierarchical clustering of the data

This plot of [Figure 5(A)] is created to visualize the trend of suicide rates over time. The plot shows that the rate of suicides has been increasing over time, from 9.9 per 100,000 populations in 2017 to 12 per 100,000 populations in 2021. This suggests that suicide prevention efforts may need to be strengthened to address this concerning trend. The dendrogram shows the hierarchical clustering of the data based on the euclidean distance between the standardized variables. The dendrogram shows how the data points (different motives of suicide) are grouped together based on their similarity [Figure 5(B)]. We can see that there are two main clusters of motives for suicide, one on the left and one on the right. The left cluster includes motives such as "Child sex Abused," "Drug Addiction problem," and "Marriage Related," while the right cluster includes motives such as "Grieving & Frustrated from life," "Financial loss / Property Related," and "Loss of Job/ Unemployed." The two clusters are quite distinct, with a large vertical distance between them on the dendrogram. This suggests that there are two broad categories of motives for suicide, one related to personal struggles and difficulties (e.g. addiction, abuse, marriage), and the other related to external circumstances (e.g. financial hardship, unemployment).

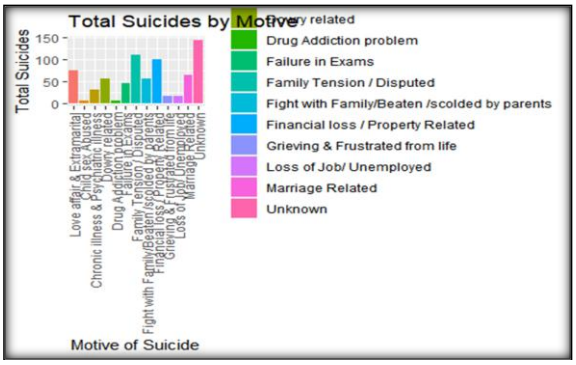

Figure 6: Distribution of total suicide cases by motive

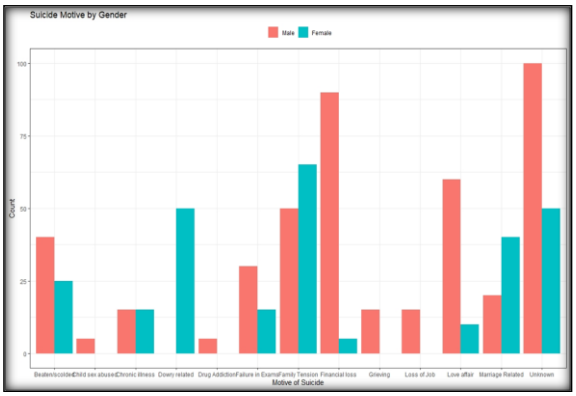

Figure 7: Distribution of total suicide cases by motive with gender wise distribution

From the plot, we can observe that the most common motives of suicide among males are financial loss/property-related issues, unknown reasons, and family tension/disputes, while the most common motives of suicide among females are dowry-related issues, family tension/disputes, and marriage-related issues [Figure 6 & 7]. It is interesting to note that dowry-related issues are not observed among males and child sex abuse, Drug addiction, Loss of jobs –related issues are not observed among females. Additionally, it can be seen that the number of suicides is generally higher among males compared to females for most of the

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motives except for marriage-related issues and Family tension.

Pearson's Chi-squared test results for Motive of suicide and Gender are as X-squared = 249.67, df = 12, p-value < 2.2e-16. The output of the Pearson's chi-squared test on the psychiatric status data shows that the chi-squared statistic is 249.67 with 12 degrees of freedom and a p-value < 2.2e-16. The p-value is less than the significance level of 0.05, indicating that we accept the null hypothesis. Thus chi-squared test results show that there is a statistically significant association between Motive of suicide and Gender. This means that the distribution of motives for suicide is not the same for males and females.

Pearson Chi-squared test results psychiatric status at in males and females are as following: X-squared = 5.2639, df = 5, p-value = 0.384. The output of the Pearson's chi-squared test on the psychiatric status data shows that the chi-squared statistic is 5.2639 with 5 degrees of freedom and a p-value of 0.3845. The p-value is greater than the significance level of 0.05, indicating that we fail to reject the null hypothesis that there is no significant association between the gender of the deceased and their psychiatric status. Therefore, we can conclude that there is no evidence of a significant difference between males and females in terms of their psychiatric status at the time of ending their life.

DISCUSSION

The study has been undertaken under title "Pattern of suicidal death in Kanpur Nagar" In this study several observations and their results over year have been considered. A total of 720 cases were taken in consideration from Kanpur Nagar. The study was of 1yr duration from 1 July 2021 to 30 June 2022. The cases were studied and analyzed.

In our study the highest number of deaths were in 20 to 30 years age group which is 300 (41.67%) out of 720 cases followed by 31 to 45 years age group 230 (31.94%) then <20 years 90 (12.50%) then 46 to 60 years 80 (11%) followed by >60 years 20 (2.78%) age group. This shows that trend of suicide age group in Kanpur is similar to other parts of India as many studies shows similarity to our finding.[5,8,13]

In this study, when age and sex both are taken in to consideration then highest number is 31 to 45 years males 160 (35.96%) which is followed by 20 to 30 years Females 160 (58.18%) which is just one less highest 31 to45 years males group, lowest is in 46 to 60 years and >60 years females 01(.67%) in both, we had similarities with most of the studies.[5,35]

In present investigation the males were 445 (61.18%) more than females 275 (38.16%) there was no one of transgender. It shows total number of male victims is more than females. The results showing similar trend are reported by Santhosh et al, Soman C.R. et al., Behera A. et al., Kumar S. et al. Further our investigation reported that there were more victims belonging to Hindu religion 665 (92.36%) then Muslims 45 (6.25%) and least from other religion 10 (1.39%).[35-37] As the Kanpur Region has more population of Hindu community so the numbers of victims are also more.

For habitat wise distribution of victims were analyzed and results shows the maximum number of victims were from Urban areas 280 (38.89%) followed by Rural 250 (34.72%), while people from semi urban 190 (26.39%). As there is increasing stress level and struggle in urban areas and in semi-urban and rural areas which are mainly agriculture based and the region is doing quite ok with agriculture, so our findings shows the trend as such. These results showing the with studies of Chavan B. S. et al., Mohanty S. et al., Santhosh C.S. et al, Pawale. D.A. et al. etc.[38-42] In our study the victims as Maximum were who were educated up to 12th standard 235 (32.64%) followed by up to 10thstandard 165 (22.92%), followed by up to 8th standard 135 (18.75%), followed by Graduates and others 110 (15.28%), followed by Illiterates 75 (10.42%). Similar results were reported by Behera C. et al., Patel. V. et al., Chavan. B. S. et al. and Mohanty. S. et al. In this study the victims maximum number of the victims were House wives 180 (25%) followed by Students 165 (22.92%), followed by Business 125 (17.36%), then were Un-employed 75 (10.42%), followed by victims doing services in government and private sector both combined 70 (9.72%), followed by laborers 55 (7.64%), followed by Farmers 50 (6.94%).[36,38-40,43]

In our study we found different trend as the reason might be increasing problems in marriage life, Kanpur is an education hub in the region so may be the reason for increased number of students.

In our study the victims per year which shows that Maximum victims were having less than 1 lac Rupees per year income 365 (50.69%) followed by 1-5 lac Rupees 330 (45.83%) and minimum were having above 5 lac Rupees 25 (3.47%) per year family income. This shows that economic status which here can be determined by the family income is surely related to vulnerability of the victims in Kanpur region also. In this study the victims Maximum were Married 370 (51.39%) followed by Un-married 275 (38.19%) followed by widow/widower 65 (9.03%) followed by Divorced 10 (1.39%). As we see correlation to the marital status shows that in Kanpur also their similar trend. In present study the victims were more from Nuclear family 375 (52.08%) than Joint Family 345 (47.92%). We found nuclear family victims were more but also many victims were who were living away from joint family which also shows somewhat of the loneliness of the victims. Further, in this study the incidence took place Indoor 475 (666.97%) than outdoor 245 (34.03%). As people who commit suicide usually seek lonely place where they do so the indoor is more common.[40,43-45]

Chart shows that since the incidence whether the victim was Hospitalized Victim died on spot 460

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(63.89%) were Maximum, in Hospital died 215 (29.86%) Followed by victims while going to the hospital 45 (6.25%). This shows that in Kanpur region also victims who commit suicide mostly found on the spot, victims mostly who died in hospital or on way to hospital were mostly of poisoning and burn. In this study the relatives gave the history whether they attempted suicide earlier or not most of them it was victims First time 650 (90.28%), followed by who attempted 70 (9.72%).[40,43,46]

In this study the Maximum victim gave history of non-abetment 665 (92.36%), few history showed abetment 55 (7.64%). As the victim is already gone many of the people try to avoid accuse others who are generally close relatives and are suspect as the actual situation is only know by the victim why they committed suicide. There were few who gave an association many of them were who were from the female victim side who accuse the husband side or the one they were very close to, there might be a false allegation but it was there so we considered it.[40,43,47]

In our study the maximum victims motive could not be determined 145, followed by having Family problems 110, followed by having Financial loss or having property related disputes 100, followed by love affair or extramarital related 75, followed by Marriage related 65, followed by victims who had fight with family members or were scolded by parents 55, followed by Dowry related 55, followed by Failure in exams 45, followed by victims suffering from chronic illness 30, followed by Aggrieved and Frustrated from life 15, and Unemployed or loss of job 15, followed by child sex abuse 5, and Drug addiction problem 5.As we saw in our study that there were many motives found as every individual has his individual conditions and situations to commit suicide however we superficially tried to form the groups and categories the motives in few of the groups.[40,48,49]

In this study the maximum victims were depressed 170, followed by stressed 160, followed by no psychiatric illness 65, followed by impulsive 20, followed by where status could not be known 15, followed by who did in aggression or anger 15. As there is usually an association between psychiatric status of victim when they take such a serious step of ending their life. In our study, the victims had previous psychiatric illness treatment 20, (2.78%) or not 700 (97.22%). As due to some personal reasons and the social reasons the relative do not tell clearly and even try to hide and many times straight away deny of any psychiatric illness or any treatment history, a very few of them told about it.[45,50] Due to hiding of the truth there was such a large variation. In this study that Maximum of males 280 (62.92%), had drug abuse history, while females 270 (98.18%) were not taking drug, followed by males 165 (37.08%) which were not taking any kind of drugs, while there was 5 (1.82%) female having history of drug abuse. The drug abuse history which is negative in many cases as the history was taken from relatives who sometimes do not know of it or some time hide as feel it disgraceful to tell as it is not socially accepted as good habit in the society. By drug history here we took history of alcohol, smoking tobacco, bhang ganja, chew tobacco, or taking any other substance for abuse. As the exact history could be extracted from the victims so there may be lesser number came out in our study.[51-53] In our study there were 35 (4.86%) suicide notes present with the victim, while with most of them it was absent 685 (95.14%) absent or could not be found as some times suicide notes are sometimes destroyed by the family members intentionally to save family members. Some time it is misplaced during crime scene Investigation as the system is not well versed in crime scene Preservation, evidence collection and Forensic science principles.[40,54]

The age group 20-30 years has highest victims and number of male victims is more than female victims. Incidence was higher in married victims and in nuclear families, which shows that there is increasing family problems and coping with them, this capacity is decreasing, which was more in joint families. This was prevalent in Indian societies earlier as the burden was shared by other family members also, the happiness, problems and sorrow were shared by family members.[13,37] In present investigation our findings shows that most of the victims were educated up to 12th standard or below, which can be a factor showing the level of their getting jobs or employment and having good income, which is further supported by the family income per year of the victims, this shows most of them had family income below one lakh which is one of the factor showing low socioeconomic status of the people. In female victims most of them were housewives, which means that they were dependent on the families earning members, Employed / earning females were less which can be related to their financial independence.[5,7,13].

Psychiatric history and psychiatric treatment history showed that there is major need of counseling and increasing awareness, as many of the victims could have been saved if they had the counseling.[55,56] In developing countries like ours where there is massive difference between the need of doctors and experts, health workers and other workers who are working at the grass root level should be trained to give the counseling and create awareness in the public for facing the problems. As early detection can be very helpful. There should be awareness programs in school and colleges and also in the villages and local societies, and in the offices in government sector as well as private sectors.[37,57]

Suicide attempters have diversities in several features. Suicide is an important and largely preventable public health problem. By the early identification and treatment of population at risk and with risk factors for suicide across the lives can be very helpful. It is important to identify populations that have been exposed to traumatic childhood

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experiences, such as sexual/physical abuse, parental domestic violence, females suffering domestic violence etc.[58] The identification of such individuals requires a multidisciplinary approach with active participation from family members, teachers and school authorities, health professionals and the legal system.[59] Primary prevention strategies include promoting physical/mental health and installing coping with stress strategies among children and sufferers; improving awareness among parents, teachers, family members and healthcare professionals regarding early intervention for maladaptive coping styles and involving legal system if required. At the community level, the establishment of social programs such as child and family support programs and programs aimed at achieving gender and socio-economic equality maybe helpful.[60]

As there is increasing involvement of media in our lives there should be programs about increasing awareness for physical health as well as mental health. There should be screening of the programs which have negative impact on the society and individuals. There should be rules and limitations on the internet activities and accessibilities. Also parents should reach doctors if there is change in behavior of their children's.[61] Recently there was news in media about Blue Whale game or Blue Whale challenge due to which participant's committed suicide there should be vigilance on such activities and also parents should be vigilant and keep an eye out on what their children's are doing and sharing on their social media account. Like regular health checkups there could be regular counselor visits to doctors after a certain interval, also people should participate in meditation and yoga activities and other recreational activities to reduce stress.[62]

Further studies and researches are required in this field as there is massive gap between people getting psychiatric help and suicide attempters, and further there is a larger gap in suicide attempters and suicide completers, in our study we have just touched tip of an iceberg. In my opinion further study should be conducted comparing normal people, with suicide attempters and suicide completer's. There should be provision of psychological autopsy in addition to medico-legal autopsy to curb the menace of suicide prevailing in our society.

CONCLUSION

Suicide poses a significant public health challenge. This study is conducted to investigate the factors associated with suicide rate in Kanpur Nagar U.P. India. An outcome of present study shows that maximum numbers of victims are male from age group of 20 to 30 years. Further major risk factors are urban habitat, low education and poor economic condition. Moreover family problems, depression, psychiatric illness and drug abuse history is responsible for majority of suicide cases. House wives and married persons are at higher risk to commit suicide. Results of present study is helpful to design and implementation of potential remedial measure.

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