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A Retrospective Study on Trends in Rates and Methods of Suicidal Cases at Tertiary Care Center in Rural India.

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ABSTRACT

Background: National suicide rate was 12 per lakh, which is the highest rate of deaths from suicides since 1967. 99% of fatal poisonings occur in developing countries, particularly among agricultural workers. It is important to know the trends and patterns of acute poisonings, as it is important for early diagnosis and treatment and also for preventive measures. The present study is a retrospective study observing suicide cases at teritiary care centre, Nandyal, Andhrapradesh- Between 2019-2022. There were 402 cases were collected retrospectively and observed rates, trends for suicide.

Method: Hospital records including patient data with intentional suicidal attempts were reviewed at Santhiram general hospital is tertiary care hospital, Nandyal, Andhrapradesh. Distributing the cases according to age, gender, year wise for knowing trends, rates of suicide and observing the outcome of suicide.

Results: Out of 402 suicidal cases Organophosphorus poisoning (19.15%), Other unknown chemical poisoning (17.66%), insecticide poisoning (7.2%), Other Pesticide poisoning (15.92%), Super-Vasmol Poisoning(13.9%), Paraquat poisoning (7.2%) and Other methods (10.7%) are the most common methods were used by both males and females.

Conclusion: Young males and females of rural background with agriculture occupation, socio-economic problems are the risk factors associated with poisoning cases.

INTRODUCTION

Suicide (Latin suicidium, from sui caedere, 'to kill oneself') is a leading cause of death among teenagers and adults under 35 years of age[1]. ranked among the top 13 causes of death for individuals of all ages worldwide by World Health Organization (WHO)[2]. It is believed that the most dramatic increase in suicide mortality will be observed in third world countries because of socioeconomic and behavioral factors[3]. Worldwide, more than a million deaths are annually reported of suicide, 20% are Indians, for 17% of the world population[4] Suicide is among the three leading causes of death among people aged 15–44 years in some countries and the second-leading cause of death among those aged 10–24 years; these figures do not include the suicide attempts, which are up to 20 times more frequent than completed suicide[5]. In the last two decades, the suicide rate has increased from 7.9 to 10.3 per 100,000 [6]. In a study published in *The Lancet* in June 2012, the estimated number of suicides in India in 2010 was about 187,000[7].According to the World Health Organization (WHO), nearly 200,000 people die worldwide from accidental poisoning and around 84% of them occur in low- and middle-income countries. In 2012, unintentional poisoning led to loss of over 10.7 million years of healthy life in terms of disability-adjusted life years. Of the nearly million suicides recorded each year, the WHO estimates that deliberate pesticide ingestion[8].In India, according to the National Crime Records Bureau reports, poisoning was estimated to contribute 4.6% of the 451,757 accidental deaths recorded in the country in 2014 and 6.3% of the 413,457 accidental deaths in 2015.ccounts for 370,000 deaths[9]. Organophosphorus poisoning occurs very commonly in southern India, where farmers form a significant proportion of the population who commonly use organophosphorus compounds like parathion as insecticides. Thus, due to the easy accessibility of these compounds, a large number of suicidal cases are encountered in this region [10]. Pesticide self-poisoning accounts for about one-third of the world's suicides. Official data from India probably underestimate the incidence of suicides. The proportion of all suicides using pesticides varies from 4% in the European region to over 50% in the Western Pacific region, but this proportion is not concordant with the volume of pesticides sold in each region; it is the pattern of pesticide use and the toxicity of the products, not the quantity used, that influences the likelihood that they will be used in acts of fatal self-harm[11].

DATA COLLECTION:-

Data on suicide rate, age, sex, methods of suicides were collected retrospectively from emergency department at teritiary care centre from January 2019 to december 2022. The reports include cause of death to differentiate different methods of suicide like self poisoning, hanging, fall from height and other methods of suicide. Total number of cases who were attempted for suicide are 402 in four years. Suicide methods were classified into eight groups according to type of poison like poisoning by pesticides, insecticides, herbicides, drugs, other methods like hanging, falling from height.

RESULTS

Table1-DISTRIBUTION OF TYPE OF SUICIDAL CASES PER YEAR (FROM 2019-2022)

	AGE					
YEARS	14-20	21-40	41-60	61-80	Total(%)	Suicidal rate per 1,00,000
2019	28(22.9%)	73(59.8%)	13(10.6%)	8(6.5%)	122(100%)	3.29
2020	19(26%)	34(46.5%)	12(16.4%)	8(10.9%	73(100%)	5.5
2021	9(8.7%)	64(62.1%)	12(11.6%)	2(1.9%)	103(100%)	3.9
2022	14(14.1%)	63(63.6%)	16(16.1%)	6(6%)	99(100%)	4.06

Figure1- Distribution of type of suicidal cases per year (from 2019-2022)

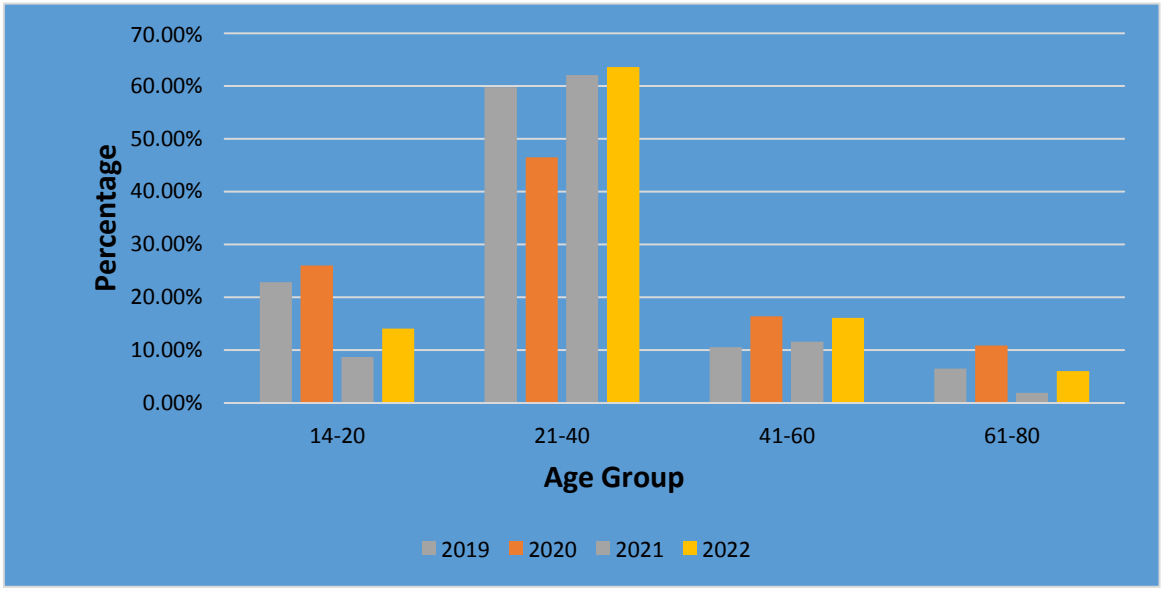


Table2- Distribution of type of suicidal cases according to gender per year

YEAR	MALE	FEMALE	Total(%)
2019	71(58.1%)	55(45%)	122(100%)
2020	34(46.5%)	39(53.4%)	73(100%)
2021	50(48.5%)	53(51.4%)	103(100%)
2022	46(46.4%)	53(53.5%)	99(100%)

Figure2- Distribution of type of suicidal cases according to gender per year

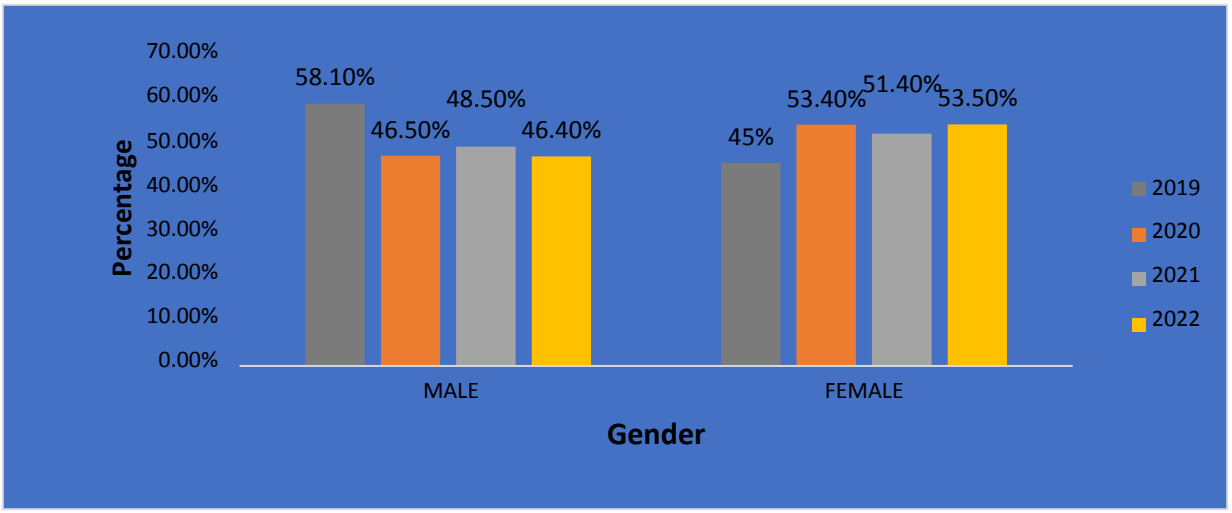


Table3- Distribution of type of suicidal cases according to method of suicide per year

YEAR	Paraquat	O.P poisoning	Insecticide poisoning	Super-Vasmol Poisoning	Multiple Tablets ingestion	Other Pesticide poisoning	Unknown Chemical Poisoning	Other Methods
2019	41(13.9%)	24(31.6%)	9(31%)	15(26.7%)	16(50%)	27(42%)	20(28.1%)	11(25.5%)
2020	3(10.3%)	20(25.9%)	8(27.5%)	12(21.4%)	2(6.2%)	13(20%)	8(11.26%)	7(16.2%)
2021	11(37.9%)	18(23.3%)	6(20.6%)	16(28.5%)	8(25%)	16(25%)	14(19.7%)	13(30.2%)
2022	11(37.9)	15(19.4%)	6(20.6%)	13(23.2%)	6(18.7%)	8(12.5%)	29(40.8%)	12(27.9%)
Total(%)	29(100%)	77(100%)	29(100%)	56(100%)	32(100%)	64(100%)	71(100%)	43(100%)

Fig3- Distribution of type of suicidal cases according to method of suicide per year

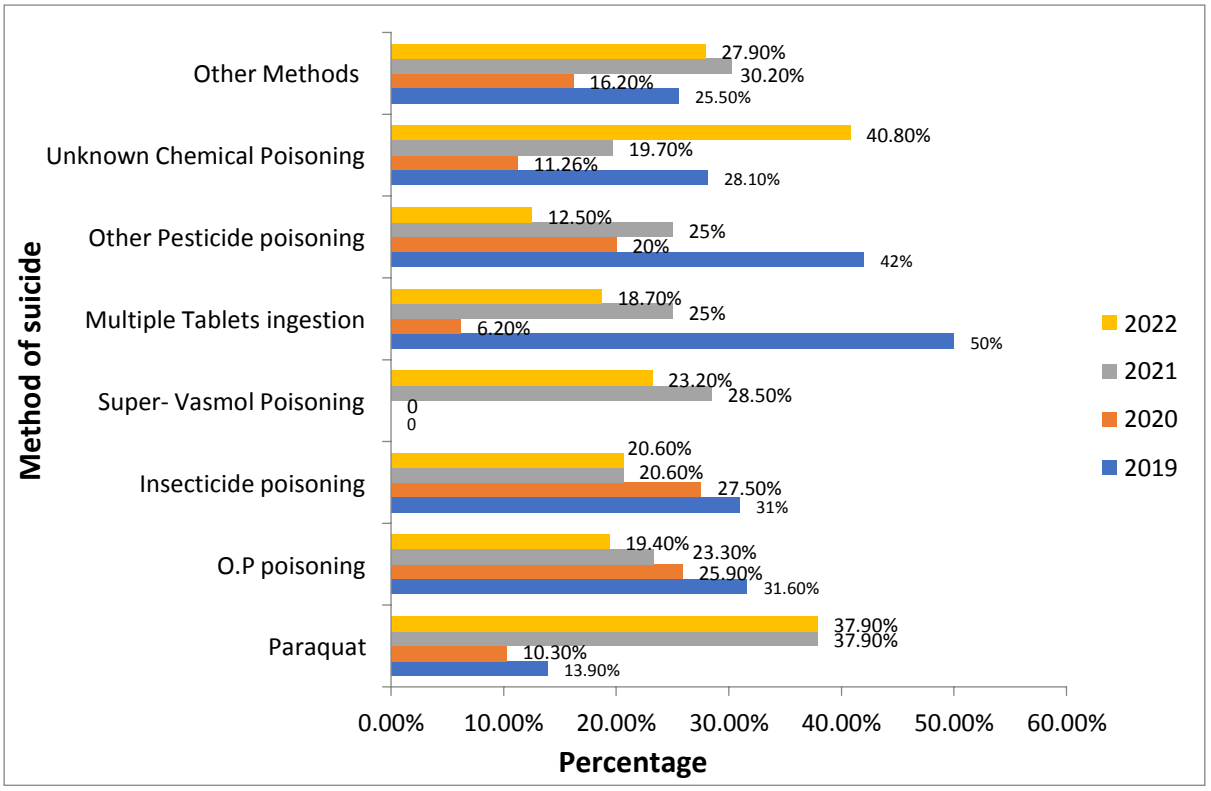
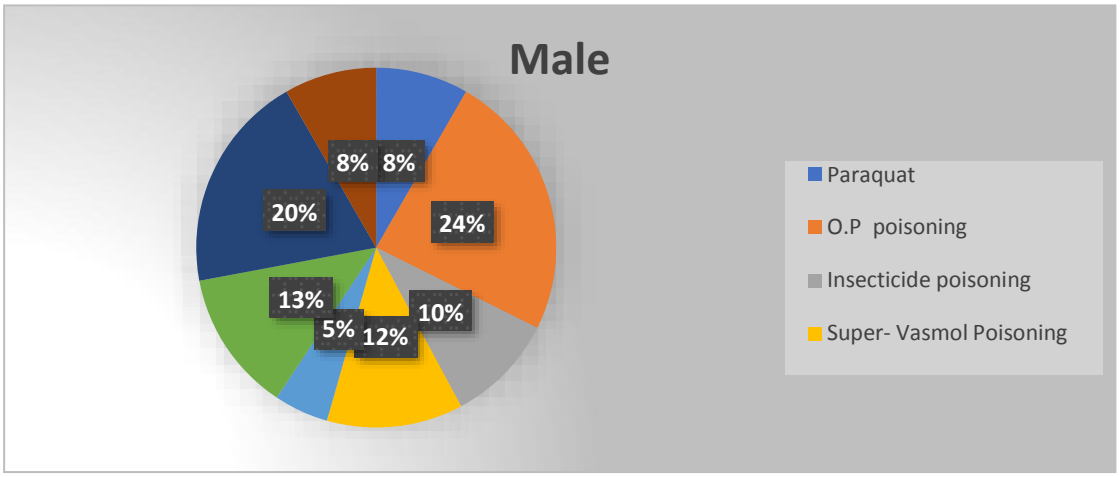


Table4- Distribution of type of suicidal cases according to gender per type of suicidal cases.

Gender	Paraquat poisoning	O.P poisoning	Insecticide poisoning	Super-Vasmol Poisoning	Multiple Tablets ingestion	Other Pesticide poisoning	Unknown Chemical Poisoning	Other Methods	Total(%)
Male	17(8.3%)	49(24%)	20(9.8%)	25(12.2%)	10(4.9%)	26(12.7%)	40(19.6%)	17(8.3%)	204(100 %)
Female	12(6%)	28(14.1%)	9(4.5%)	31(15.6%)	22(11.1%)	38(19.1%)	43(21.7%)	15(7.5%)	198(100 %)

Fig4- Distribution of type of suicidal cases according to gender per type of suicidal cases.



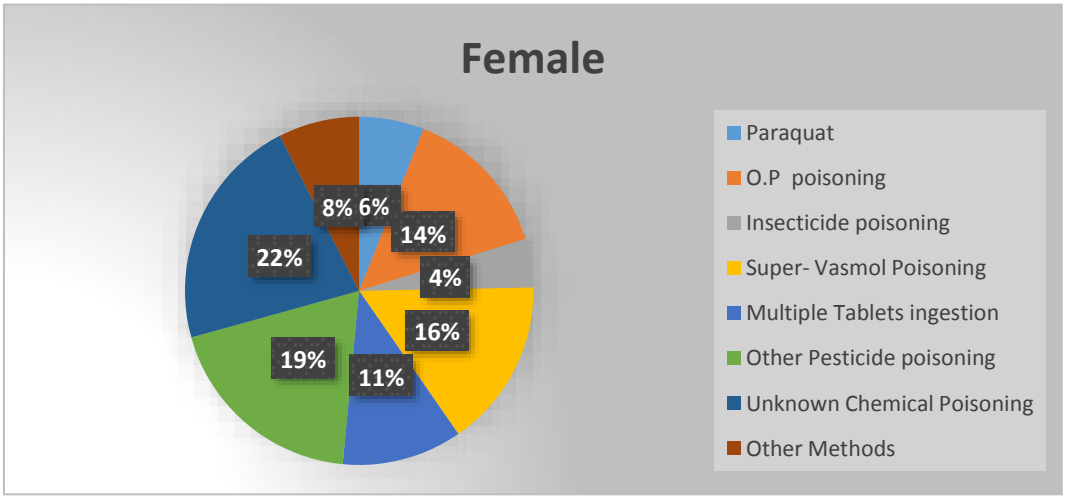
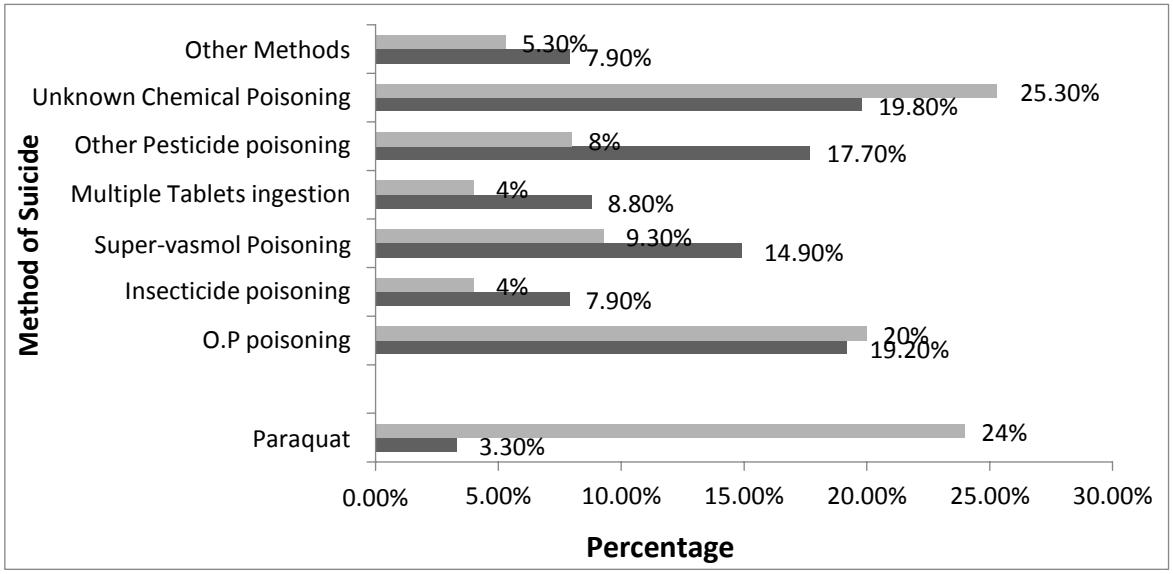


Table5-Outcome according to method of suicide

Method of suicide	Outcome	
	Live	Death
Paraquat poisoning	11(3.3%)	18(24%)
O.P poisoning	63(19.2%)	15(20%)
Insecticide poisoning	26(7.9%)	3(4%)
Super-vasmol Poisoning	49(14.9%)	7(9.3%)
Multiple Tablets ingestion	29(8.8%)	3(4%)
Other Pesticide poisoning	58(17.7%)	6(8%)
Unknown Chemical Poisoning	65(19.8%)	19(25.3%)
Other Methods	26(7.9%)	4(5.3%)
Total(%)	327(100%)	75(100%)



Distribution of type of suicidal cases per year collected from 2019 to 2022 is shown according to year wise and age group wise in table-1. This table shows that total number of cases of suicide in rural areas during the period of four years was 402. The suicide rate per 1,00,000 ranged from 3.29 in 2019 to 5.5 in 2022. Table 2 shows the distribution of suicide cases among males and females per year. It shows that out of 122 cases the rate for males was 58.1% and for females it was 45% in the year 2019 to 2022, out of 99 cases the rate for males was 46.4% and for females it was 53.5%. The suicide cases were concentrated in the age group of 21-40 years from 2019 to 2022 was 59.8%,46.5%,62.1%,63.6% followed by the age group of 14-20which includes22.9%, 26%, 8.7%, 14.1%, which is considered as full young people age group range and this indicates a robust problem. Figure 2 shows that the trendency of males to commit suicide was more than that of males . Table3 shows that distribution of suicidal cases according to method of suicide per year. It shows that suicide due to pesticide poison (42%) is the most common method in the year 2019 followed by Organophosphorus poisoning (31.6%) , insecticide poisoning (31%).In the years 2020, 2021 suicide due to Organophosphorus poison (25.9%) is the most common method. In the year 2022 suicide due to unknown chemical poisoning is the most common method(40.8%) followed by suicide with supervasmol poisoning(23.2%). Figure 4 describes distribution of type of suicidal cases among males and females. It shows males were committed for suicide most commonly by using chemical pesticides (Organophosphorus poisoning, insecticide poisoning, chemical poisoning, paraquat poisoning). Females were also committed for suicide most commonly by using Organophosphorus poisoning, supervasmol, other chemicals and other methods of suicide. Table5 shows outcome of individuals who committed for suicide by different methods.out of 402 patients 327 were recovered and 75 were died. Most of the death cases observed in patients who consumed paraquat poisoning (24%) and also by consumption of unknown chemical poisoning like pesticides and herbicides (25.3%). However recovery rate is higher among patients who took pesticide poisoning.

DISCUSSION:-

The overall suicidal cases from 2019 to 2022 were found to be 402. We observed that the percentage of females consuming poison largely outmembered the females. This observation is contrast with other studies [12]. The maximum poisoning are observed in comparatively younger age group, which may be explained on the basis that it is the most active period of life with the tendency to take risks in the acts of passion. Other studies also report the same pattern [13]. In this study 21-40 years age group (58.2%) mostly committed for suicidal attempts. Another study[14] reported 30-39 years age group in 35% of poisoning death and yet another [15] reported 16-25 age group as mostly affected in 37% of poisoning deaths. This current study finding showing that poisoning as commonest method adopted to commit suicide (81.3%) in both genders, this will matches with some other studies too [16,17]. Poisoning has been regarded as leading cause of death in rural and agricultural areas across the world. According to WHO 99% of poisonings out of annual 2,51,881 occur in developing countries and particularly among agricultural workers. In this present study Organophosphorus poisoning, insecticidal poisoning, other chemical poisonings were most commonly responsible agents for toxicity in poisoning cases. In India opium and arsenic were very commonly used poisons in the past but with the change of time, commonest cause of poisonings in India and other developing countries is pesticide poisoning, herbicide poisoning, insecticide poisoning, hanging, fall from height are the reasons being used for the commitment of suicide due to agriculture based economy poverty and easily availability of highly toxic pesticides[17]. The present study evaluates the rates, trends and distribution of suicide from 2019 to 2022 in rural India at a tertiary care hospital. The rate of suicide every year from 2019 to 2022 include 3.29, 5.5, 3.9 and 4.06 per 1,00,000 persons. This may be explained by the effect of increasing depression, love affair, extra marital affairs, agricultural and economic burdens. The age distribution for males and females to be in the range of 14 to 40 years (59.8%, 46.5% 62.1%,63.6%) in all four years was observed highest rate of suicidal tendency when compared to other age groups, this age group is the age of youth for work and in females the age of reproduction. One study demonstrated that 37.8% of suicides in India are carried out by those below the age of 30 years and 71% of suicides in India are among people who are below the age of 44years[18] this imposes a huge social, emotional and economic burden on the society. The suicide rate decreases as age increases among males and females, which can be

explained by increase in the level of responsibility of males and females towards their families. The cause of death among individuals who attempted for suicide as shown in figure 5 the cause of death was due to consumption of paraquat (24%) and other chemical pesticide poisoning (25.3%) out of 75 death cases. Among males they attempted for suicide by consuming mostly Organophosphorus poisoning (24%), vasmol poisoning (12%), other pesticide poison (13%), insecticide poisoning (10%), paraquat poisoning (8%), unknown poison (20%), other methods (8%). Among females they attempted for suicide by consuming mostly unknown chemical poisoning(22%) (herbicide poisoning corrosive poisoning), other pesticide poisoning(19%), paraquat poisoning (6%), super vasmol poisoning (16%), insecticide poisoning (4%), other methods (8%), like hanging,fall from height, sanitizer poisoning, rat poisoning and multiple tablets consumption (11%). Some studies demonstrated that methods of suicide in different countries according to the WHO mortality database finding that in most of the studied countries hanging was the most frequent cause of suicide among males followed by firearm and poisoning[19].

In the present study suicide due to other chemical poisoning (22%) was more common for females and other pesticide poisoning (19%).

CONCLUSION

From this study it may be concluded that female sex, young age, married status,bpsychological condition, economic burden(mostly with low socio-economic class) are the risk factors for poisoning with positive correlation. By developing effective poisoning prevention strategies can effectively reduce its impact on the health of the general rural population.proper education regarding use of pesticides, insecticides, herbicides might avoiding the intentional and un intentional exposure to the chemicals especially the incidence of insecticidal poisoning can be reduced by strict control of sales, distribution and storage by mass awareness and suitable legislation. Through proper scientific counseling can check the high incidence of poisoning in young and married population by the way of effectively tackling the social, marital and psychological problems. Poison information centres should be set up apart from first aid facilities as immediate treatment can help in saving the lives in many cases. Governments, NGO's and other social groups help through sincere and severe work at many levels like economy, poverty, agriculture, irrigation and markets is the most needful for society. Research help determine which factors can be modified to help prevent suicide and what interventions are taken appropriately for a scientific group of people. In 2003 some measures were taken for prevention of suicidal attempts like monographs, reducing social isolation, treating mental disorders. This efforts for solving youth's problems to decrease the rate of suicide in the society. The present study demonstrated methods for suicidal attempts by both genders according to age groups which is due to a series of socio-economic, psychological and cultural practices. It raises awareness and stirs up interests with regards to the serious public health and community burden represented by suicide.

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