Original Article

The Suicide Rate and Its Reasons in Children Under Age 18 Years Studied in a Tertiary Care Hospital.

Rikabder MMR[1], Uddin MK[2], Mohaimen MS[3], Islam MS[4], Chowdhury MIB[5]

1. **Md. Mashiour Rahman Rikabder, Assistant Professor, Department Of Forensic Medicine, Jahurul Islam Medical College, Kishoregonj, Bangladesh*
2. *Md. Kafil Uddin, Associate Professor & Head, Department Of Forensic Medicine, Rajshahi Medical College, Rajshahi, Bangladesh*
3. *Mohammed Shafi Mohaimen, Assistant Professor, Department Of Forensic Medicine, Shaheed Ziaur Rahman Medical College, Bogura, Bangladesh*
4. *Mohammad Saifule Islam, Associate Professor, Department Of Forensic Medicine, Jahurul Islam Medical College, Kishoregonj, Bangladesh*
5. *Md. Iqbal Bahar Chowdhury, Associate Professor, Department Of Forensic Medicine, Shaheed Monsur Ali Medical College, Dhaka, Bangladesh*

****For correspondence***

Abstract

Background: *The suicide rates are on a rise in the recent days. Due to the increasing trend of suicide attempts in recent years, special programs should be considered for some countries. Suicide is often caused by despair following mental disorder, substance abuse, or alcohol abuse. The type of suicide is determined by various factors, such as accessibility to drugs, economic problems, and psychological disorders.*

Objective: *To assess the rate of suicide and its reasons in children <18 years.*

Methods: *This was a cross-sectional study was conducted at the Department Of Forensic Medicine, Rajshahi Medical College & Hospital, Rajshahi, Bangladesh from January 2018 to December 2021. Total 150 young people consisted by suicide less than 18 years of age in who had struggled with suicide. In the next stage, the files of children under 18 years of age who had struggled with suicide were collected. Data were analyzed using SPSS software v. 20.*

Results: *Mean±SD age of children was 16.36±1.76 years. The most common method in children less than 15 years and over 15 years was hanging (n=16) and poisoning with chemical substances (n=54), respectively (P<0.001). The most common method of suicide was poisoning with chemical substances (n=63, 42.0%). The most common method of suicide in girls and boys was poisoning with chemical substances (n=36) and hanging (n=30), respectively. The highest number of children who struggled were residents in the outskirt of Tehran (n=48, 32%). The suicide rate in people with depressive disorder and tentative injury was 10.0% (n=15) and 18.7% (n=28). In 13 patients, vitreous humor alcohol was positive (Mean±SD alcohol: 60.61±43.03 mg/dl). The most common toxin observed in toxicology was rice tablet or aluminium phosphide (n=35, 23.3%). Regarding drug toxicity in toxicology, 78% (n=52) was not positive. Opium was found in 5.3% of cases (n=8).*

Conclusion: *The suicide rate has been on the rise during the past ten years through hanging and poisoning with chemical substances, such as aluminium phosphide, opium, and tricyclic antidepressants, especially in the outskirts.*

Keywords: *Suicide, childhood experience, epidemiology.*

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Introduction

The suicide rates are on a rise in the recent days. Due to the increasing trend of suicide attempts in recent years, special programs should be considered for some countries[1]. Suicide is often caused by despair following mental disorder, substance abuse, or alcohol abuse. The most common methods of suicide vary from country to country and to some extent depend on the available methods. Common methods include hanging, poisoning with drugs and toxins, firearms, etc. About one million people die of suicide each year, making it the tenth leading cause of death worldwide[2]. The reasons vary from place to place, prevalent social customs and traditions, degree of poverty, urbanization and, gender of the individual. All these factor in varying degree, along with the personality or temperament of the individual results in the outcome-the behaviour. The registered suicide rate among adolescents has almost tripled over the past few decades, which is now the second leading cause of death among adolescents and young adults[3]. In Europe, the suicide rate among adolescent women is lower than men[4].The number of children and adolescents who die as a result of suicide is increasing over time. Psychological screening may identify accurate individuals at risk of death due to the relative rarity of suicide deaths[5]. Suicide rates in Iran are lower than in most countries, especially Western societies, but are higher than in most Middle East countries[6]. Research all over the world on suicide predisposing factors clearly demonstrates the role of drug use and substance abuse. Although previous research has examined quantitative data elements to characterize childhood suicide, this study's qualitative approach uniquely captures additional details and context related to each incident[7, 8]. A better understanding of underlying factors associated with childhood suicide can inform developmentally appropriate prevention strategies for this population.

Materials and Methods

This was a cross-sectional study was conducted at the Department Of Forensic Medicine, Rajshahi Medical College& Hospital, Rajshahi, Bangladesh from January 2018 to December 2021. Total 150 young people consisted by suicide less than 18 years of age in who had struggled with suicide. In the next stage, the files of children under 18 years of age who had struggled with suicide were collected. The autopsy report and corpse samples were collected by experienced staff and sent to the toxicology laboratory of Forensic Medicine Center and the toxicology analysis report was recorded. According to the toxicological analysis report of legal drugs (including commonly used drugs in the pharmaceutical market, such as benzodiazepines, barbiturates, phenothiazine, tricyclic antidepressants, etc.) and abused drugs (opioids, amphetamine-like compounds, alcohol, etc.) were collected in a toxicological analysis. Other information was the type of drugs, age, gender, level of education, season, marital status, history of suicide, having a mental disorder, and place of suicide. The collected data were analyzed by SPSS software version 20 using descriptive (frequency, percentage, Mean± SD) and analytical (Chi-square test and Pearson correlation coefficient) tests.

Results

Total 150 suicides that underwent autopsy and toxicological assessment were investigated. The Mean±SD age of children in this study was 16.36±1.76 years and the age range was 11-18 years. The most common method in children less than 15 years and over 15 years was hanging (n=16) and poisoning with chemical substances (n=54), respectively, which showed a statistically significant difference (P<0.001) (Table-1). The most common method of suicide was poisoning (n=63, 42%), followed by hanging (n=52, 34.7%) and the rarest method was using a knife (n=1) and jumping in front of a metro (n=1).

Table I: Suicide methods in children age years (N=150)

Suicide Method	Age		N	(%)
	<15	15≥		
Hanging	16	36	52	34.7
Fall	8	17	25	16.7
Chemical substance	9	54	63	42
Burning	1	3	4	2.7
Warm weapon	0	2	2	1.3
Choke down with gas	0	2	2	1.3
Metro	0	1	1	0.7
Knife	0	1	1	0.7

Table II: Education level of the study samples (N=150)

Education Level	N	(%)
Illiterate	8	5.3
Primary school	19	12.7
Middle school	52	34.7
High school	60	40
Diploma	11	7.03

The most common educational level was high school (n=60, 40%). The level of illiteracy was 5.3% (n=8) (Table II).

Table III: Frequency of suicide based on the place of residence (N=150)

Suicide place	No.	(%)
Upscale area	17	11.30%
Midscale area	23	15.30%
Downscale area	40	26.70%
Outskirt	48	32.00%
Outside of city	22	14.70%

The highest number of children were residents in the outskirt of city (n=48, 32%) and then the downscale area had 40 suicides (26.7%) because these areas are not in a good economic and social situation and it requires attention and psychological training and how to properly deal with young people and adolescents by parents and school officials (Table III).

Table IV: Comparison of the males and females regarding the method of suicide (N=150)

Suicide Method	Variable		No	(%)
	Female	Male		
Hanging	22	30	52	34.7
Fall	15	10	25	16.7
Chemical substance	36	27	63	42
Burning	3	1	4	2.7
Warm weapon	1	1	2	1.3
Choke down with gas	1	1	2	1.3
Metro	0	1	1	0.7
Knife	0	1	1	0.7

In terms of gender, 52% of the children were girls (n=78) and 48% were boys (n=72), but there was no significant difference between the two groups (P>0.05). The most common method of suicide in girls was poisoning with chemical substances (n=36), followed by hanging (n=22). It should be noted that suicide with a knife had not been seen in this period. The most common method of suicide in boys was hanging (n=30), followed by poisoning with chemical substances (n=27). The method of jumping in front of the metro was not seen in boys at all (Table-IV).

Table V: Comparison of the children regarding the history of depression and tentative injuries (N=150)

Variables		No.	(%)
Tentative injury (self-stabbing)	Yes	28	18.7
	No	122	122.3
Depression	Yes	15	10
	No	135	90

The suicide rate in people with depressive disorder according to parent declaration was 10% (n=15) and the most common method of suicide was poisoning (n=28, 18.7%). The suicide rate in people who had the effects of the tentative injury on the body at the autopsy was 18.7% (n=28) (Table V).

Table VI: Correlation of the age and vitreous alcohol level (N=150)

Correlation		Alcohol
Age	Pearson correlation coefficient	0.346
	P	0.247
	N	13
	Alcohol (Mean± SD, range), mg/dl	60.61±43.03, 10-169

In 13 patients, vitreous humor alcohol was positive; the Mean± SD level of alcohol was 60.61±43.03 mg/dl (ranging from 10-169). No relationship was found between age and alcohol level. According to the autopsy examination, only one case of severe suspected injury was seen in hymen and anal examination (Table VI)

Table VII: Comparison of the children regarding the suicide method (N=150)

Variables		Addiction		No	(%)	X2	P
		No	Yes				
Suicide method	Hanging	51	1	52	34.7	**4.947**	**0.987**
	Fall	23	2	25	16.7		
	Chemical substance	57	6	63	42		
	Burning	4	0	4	2.7		
	Warm weapon	2	0	2	1.3		
	Choke down with gas	2	0	2	1.3		
	Metro	1	0	1	0.7		
	Knife	1	0	1	0.7		

In this study the most common method used for suicide in the addicted children was poisoning with chemical substances (n=63, 42%), followed by hangings (n= 52, 34.7%) (Table VII).

Table VIII: Frequency of suicide based on the drug used (N=150)

Drug Toxicity	No.	(%)	Drug Toxicity	No.	(%)
No	78	52	Propranolol+ Diltiazem	1	0.7
Rice tablet	35	23.3	Colchicine	1	0.7
Carbamazepine	1	0.7	Rice tablet+ Alcohol	1	0.7
Alcohol	1	0.7	Rice tablet+ Opioid	1	0.7
Propranolol	1	0.7	CO	1	0.7
Chloroquine	1	0.7	Tricyclic Antidepressants+ Benzodiazepines	1	0.7
Alprazolam	1	0.7	Barbiturate+ Propranolol+ pesticide	1	0.7
Alcohol+ Rice tablet	1	0.7	Lidocaine	1	0.7
Benzodiazepine+ Rice tablet	1	0.7	Methamphetamine	1	0.7
Opioid+ Psychedelic drugs	1	0.7	Hydrochloric acid	1	0.7
Verapamil	1	0.7	Paracetamol+ Naproxen	1	0.7
Lidocaine+ Alcohol	1	0.7	Opioid	8	5.3
Tramadol+ Alcohol	1	0.7	Antidepressant	1	0.7
Propranolol+ Tricyclic Antidepressants	1	0.7	Benzodiazepines	1	0.7
Glibenclamide	1	0.7	Pesticide	1	0.7
Tramadol+ Diazepam+ Ibuprofen	1	0.7	Antihistamine	1	0.7

The most common toxin observed in toxicology was rice tablet or aluminium phosphide (n=35, 23.3%). Regarding drug toxicity in toxicology, 52% (n=78) was not positive. Opium was found in 5.3% of cases (n=8). The use of tricyclic antidepressants was reported in 0.7% (n=1) of cases and the use of propranolol was 0.7% (n=1) (Table VIII).

Discussion

The most common suicide methods (hanging and multiple injuries) carry a high likelihood of fatality. A number of stresses were identified: family mental illness, childhood abuse or neglect, bullying, bereavement, academic stresses and physical health conditions. Other antecedents included mental illness, self-harm and illicit drug or alcohol misuse. Suicide-related internet use was reported in a quarter of the young people, including a significant minority who had communicated suicidal ideas on social media, although the commonest type of internet use was searching for information on suicide methods. In our study total 150 suicides that underwent autopsy and toxicological assessment were investigated. The Mean± SD age of children in this study was 16.36±1.76 years and the age range was 11-18 years. The most common method in children less than 15 years and over 15 years was hanging (n=16) and poisoning with chemical substances (n=54), respectively, which showed a statistically significant difference (P<0.001). They showed that the incidence of suicide and gender differences increase with age; hanging was the most common method, and the rate of psychiatric disorders was lower among child suicides. Previous suicide attempts have been a significantrisk factor.Children drank less alcohol before struggling with suicide[9]. Zalar et al. examined suicide methods leading to death[10]. Suicide records over the past 40 years showed that hanging, as the most common form of suicide, is a suicide attempt in men with the aim of causing death, not a suicide attempt. On the other hand, drug use is associated with suicide attempts and is more commonly used by women. Not all suicidal ideation can predict suicidal death. Identifying the most determining risk factors for suicidal behavior can be used as a basis for planning effective prevention strategies, timely identification, and adequate professional assistance to people at risk. Laido et al. reported their study results on children's suicide. They stated that the suicide rate significantly declined from 2018-2021 only in males but there were no significant changes in the female suicide rate. Also, about 30% of suicide method was hanging[11]. These results were not consistent with our results because using chemical substances was the dominant method and the second reason for death was hanging. Polewka et al. revealed that suicide attempts are more common among young people, especially teenage girls and young women. The suicide rate in this age group has increased dramatically in the last few years. A multistage study of the World Health Organization (WHO) on suicide behavior shows that Europe has the highest annual average rate of suicide attempts among young women aged 15 to 24 years[12]. These authors declared that being histrionics among females, and Schizophrenia and Paranoia among males are effective factors to struggle with suicide. Although the majority of suicides in this age group are in boys, there have been particular concerns about rising rates of suicide and self-harm in girls and young women. Many of the stresses we identified were significantly more common in girls. These included childhood-related antecedents' such as family mental illness and domestic violence, abuse, parental bereavement, bullying, current or impending exams or exam results, physical health conditions and self-harm. The structure of the family can play the main role in the prevention of suicide attempts. Shooshtari et al. indicated that conflicts in the family (spouse, parent, and children) were effective psychosocial factors in suicidal attempts[13]. Our study was consistent with the study by Shooshtari et al. because depressive disorder and tentative injuries showing mental disorder were reported in the cases but due to the young sample in our study, the severity of depression and other mental disorders had low frequency. Todeshkchuei et al. performed a study entitled "psychosocial factors associated with suicidal behavior".They showed that family conflicts and lower education levels are associated with suicide attempts[14]. McLone et al. assessed factors associated with suicide among adolescents and young adults. The majority of adolescents and young adults had a mental disorder[15]. Another study on adolescent students by Pandey et al. showed that food insecurity, anxiety, loneliness, and gender are affecting factors. They indicated that having some close friends can protect against suicide[16]. This result was inconsistent with our results, e.g. gender in our study caused no difference. It may be due to cultural differences between Bangladesh and others country. Food insecurity can be related to economic status and place of residence, and then we can attribute the food insecurity of downscale or outskirts in our study that affected the suicide. Marion et al., elderly suicide rates increased by deviations of monthly mean temperature. It means that season can affect the elderly's suicide rate[17]; however, our results were not consistent in this regard and the frequency of suicide showed no significantly significant difference in terms of season.

Conclusion

The suicide rate has increased during the past few years through hanging and poisoning and with chemical substances, such as aluminium phosphide, opium, and tricyclic antidepressants, especially in the outskirts. It is important to take main actions regarding people's inaccessibility to medicines and preventive measures. By reviewing the obtained results, it is possible to provide information about suicide methods to the relevant authorities and parents and to provide information and to warn the general level of the community to prevent and create awareness about it for educating high-risk individuals.

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