

An Evaluation of Psychiatric Disorders and its Associated Factors of Morbidity in Bangladesh

Dr. Md. Aminur Rahman^{1*}, Prof Md. Rezaul Karim², Dr. ABM Saiful Alam³, Dr. Abu Taher⁴

¹Assistant Professor (Psychiatry), Jashore Medical College, Jashore, Bangladesh

²Principal & Professor of Psychiatry, Women's Medical College, Sylhet, Bangladesh

³Associate Professor (Medicine), Jashore Medical College, Jashore, Bangladesh

⁴Professor (Psychiatry), Shaheed Ziaur Rahman Medical College, Bogura, Bangladesh

*Corresponding author: Dr. Md. Aminur Rahman

| Received: 06.05.2019 | Accepted: 11.05.2019 | Published: 22.05.2019

DOI: [10.21276/sjams.2019.7.5.11](https://doi.org/10.21276/sjams.2019.7.5.11)

Abstract

Original Research Article

Attempted suicide is an increasing burden on medical and psychiatric services. To evaluate psychiatric morbidity among the suicide attempters. This was a cross sectional descriptive and comparative study conducted in the Department of Psychiatry, Sylhet MAG Osmani Medical College Hospital, and Sylhet, Bangladesh during the period from January 2009 to December 2009. Fifty-nine (59) suicide attempters were selected according to inclusion and exclusion criteria and categorized as attempted suicide group. Age and sex matched 59 healthy control were also selected and categorized as control group. We found the mean age of the patients was 23.542 ± 8.918 years which was similar to control group ($p=1.000$). Most of the patients (86.5%) were below the age of 30 years. Male constitute 40.7% and female 59.3% which was similar to the control group ($p=0.710$). Disease process (39.0%) was the most common cause of suicide attempt, followed by family problem (33.9%), quarrel with spouse (11.8%), quarrel with boy/girlfriend (8.5%), poverty (3.4%), failure in examination (1.7%) and unknown cause (1.7%). The co-morbid psychiatric disorder was present in 69.5% of suicide attempters and 13.5% in control group. The difference between the groups is statistically significant ($p<0.001$). The most common psychiatric disorder in suicide attempters was major depressive disorder (32.2%), followed by anxiety disorder (13.6%), schizophrenia (10.2%), adjustment disorder (5.1%), personality disorder (3.4%), schizophreniform disorder (3.4%) and bipolar mood disorder (1.7%). The co-morbid psychiatric disorder was most frequent in suicide attempters and there was a highly significant difference in psychiatric morbidity in suicide attempters as compared to healthy control ($p<0.001$) who were identical to the age and gender which strongly supports the hypothesis.

Key word: Psychiatric, Morbidity, Suicide Attempters.

Copyright © 2019: This is an open-access article distributed under the terms of the Creative Commons Attribution license which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use (NonCommercial, or CC-BY-NC) provided the original author and source are credited.

INTRODUCTION

Suicide is an act with a fatal outcome that is deliberately initiated and performed by the person in the knowledge or expectation of the fatal outcome [1]. Attempted is an unsuccessful suicide act with no fatal outcome, in which an individual deliberately causes self-injury or ingests a substance in excess of any prescribed or generally recognized therapeutic doses. It also labeled as suicide attempts, para suicide or deliberate self-harm [2]. Suicide is a major cause of mortality and use of health resources. It is also a tragic and serious preventable public health problem all over the world [3]. The World Health Organization estimates that one suicide attempt occurs approximately every three seconds, and one completed suicide occurs approximately every minute. This means that more people die by suicide than by armed conflict. Consequently, reducing suicide has become an

important international health goal [4]. Suicide among adolescents and young adults are a national tragedy and a major public health problem. Indeed, during the past several decades, suicide has come to play a proportionately larger role in teenager deaths [5]. Attempted suicide is one of the strongest predictors for future suicide, which is one of the leading causes of death worldwide among people under the age of 45. It is being gradually recognized as a major health problem that urgently calls for vigorous preventive action [6]. The magnitude of attempted suicide is not clearly known. Epidemiological data suggest 12 months prevalence rates for suicide attempts of 4.6% [7], but it has been suggested that there may be 8-25 suicide attempts for every completed suicide [8]. Nearly 10-30% of registrations in hospital emergency departments are due to attempted suicide [9]. The suicide rate in men is more than four times that in women [11]. Whereas,

attempted suicides are four times more in women than man [10]. In India a study in Ludhiana, the biggest densely populated city of Panjab showed that 41% of the attempted suicides were the age group of 20-29 years, 32% were below 20 years, 22% were 30-39 years and only 5% were above the age of 40 years. Attempted suicides were more among males (58%) than female (42%) and from middle class, nuclear families [12]. In a study in Dhaka, the capital city of Bangladesh Ali *et al.* [7] found that majority (45.6%) of the attempted suicides were below 25 years, followed by the age group of 26-35 years (42.6%), and more than 36 years (11.8%). Attempted suicides were more among female (54.4%) than male (45.6%) [7]. Women demonstrated nonfatal suicidal behavior two to three times more than men [13]. Pattern of self-harm is also different between developing and developed countries. The people of developed countries mostly use psychoactive substances, in contrast, agrochemical by the people of developing ones. In self-poisoning by benzodiazepine, analgesic, antidepressant (89.5 to 92.5%); self-injury by cutting, jumping and hanging (10.7 to 12.1%); occasionally both methods are used for suicide attempts [14]. Suicidal behavior has been linked to biological, cognitive, psychological, social and familial factors. Most of the western studies reported that psychiatric disorders were the main risk factors in adult suicides. In psychological autopsy study performed in the southeastern part of Turkey, the number of psychopathological conditions was reported to be 69% [15]. Psychiatric disorders are the most important risk factors for suicide. Patients with psychiatric disorders or a family history of psychiatric disorder have an increased risk of suicide. The rate of suicide with depression was identified to range from 47% to 90%, whereas people with affective psychosis, personality disorders, schizophrenia, and alcohol and drug abuse problems are more prone to suicide [16]. A study in Bangladesh, Ali *et al.* [7] found that about 66% of suicide attempters had some psychiatric problems and about 14% had medical disorder. Among the psychiatric disorder, 70.6% had major depressive disorder, 16.2% had personality disorder, and 4.4% had schizophrenia [7]. It has been found that aggression, hostility, and a history of substance use disorders would predict future suicidal behavior in men. While depressive symptoms, history of abuse in childhood and comorbid borderline personality disorder would do so in women [13]. The prevalence of suicide attempt in schizophrenia is reported to range from 18 to 55%. Depression appears to be an important risk factor for suicide attempts [14]. The slogan, "Suicide prevention is everybody's business", has been used in a number of campaigns around the world in recent years, and there is growing recognition of the need for whole community approaches to suicide prevention [17]. For prevention, early detection and treatment of psychiatric disorders associated with attempted suicide the precise knowledge of morbidity is essential. With this view, this study was designed to evaluate psychiatric morbidity in suicide attempters.

Objectives

a) General objective

- To evaluate psychiatric morbidity among the suicide attempters.

b) Specific Objectives

- To identify psychiatric disorders among the suicide attempters.
- To find out specific types of psychiatric disorders among the suicide attempters.

METHODOLOGY AND MATERIALS

This was a descriptive and cross sectional study in the Department of Psychiatry Sylhet M.A.G Osmani Medical College Hospital, Sylhet. All patients with suicide attempts admitted in the different wards in Sylhet M.A.G Osmani Medical College Hospital, Sylhet, were included as a study population. All patients with suicide attempts admitted in the different wards in Sylhet M.A.G Osmani Medical College Hospital, Sylhet, and fulfilling the inclusion and exclusion criteria were selected as a sample for the study. Informed consent was taken from the patients. Attempters were interviewed using the semi structured questionnaire containing socio-demographic and other relevant information about attempted suicide and psychiatric disorders. Control group was also interviewed using the same semi structured questionnaire. Mental state examination of both suicide attempters and control were done and recorded in a MSE sheet. For diagnosis of psychiatric disorders all respondents were assessed by using DSM-IV criteria and psychiatric disorders were confirmed by psychiatrist. The interview was held in a peaceful, non-threatening environment. After collecting data editing was done manually and was analyzed with the help of computer software program such as SPSS version 16.0 (Statistical package for social science). Mean and standard deviation were calculated for continuous data and % for categorical data. To test the significance, chi-square test and Fisher's exact test were applied where necessary. For all analytical tests a value of 5% or less ($p=0.05$ or $p<0.05$) was considered significant.

Inclusion Criteria

- All attempted suicide cases attending in Sylhet M.A.G. Osmani Medical College Hospital, Sylhet, irrespective of age and sex.

Exclusion Criteria

- Mute, stupor, non-communicable patients.
- Those who denied giving any information.
- Seriously ill patients.

RESULTS

This was a cross sectional descriptive and comparative study conducted in the Department of Psychiatry, Sylhet MAG Osmani Medical College

Hospital, Sylhet, Bangladesh during the period from January 2009 to December 2009 with a view to evaluate psychiatric morbidity among the patients with attempted suicide. For this purpose 59 patients of attempted suicide were selected according to inclusion and exclusion criteria and categorized as attempted suicide (AS) group. Age and sex matched 59 healthy control were also selected and categorized as healthy control group. In attempted suicide group most common co-morbid psychiatric disorder was major depressive disorder (32.2%), followed by anxiety disorder (13.6%), schizophrenia (10.2%), adjustment disorder (5.1%), personality disorder (3.4%), schizophrenia form disorder (3.4%) and bipolar mood disorder (1.7%). There was no associated psychiatric disorder in 30.5% patients. In control group most common co-morbid psychiatric disorder was anxiety disorder (6.8%), followed by major depressive disorder (3.4%), adjustment disorder (1.7%) and personality disorder (1.7%). There was no associated psychiatric disorder in 86.4% of control group. There was no statistically significant difference between the age group of the respondents in attempted suicide group and control group ($p=0.729$). The sex difference between the respondents of attempted suicide group and healthy control group did not show any statistically significant difference ($*p=0.710$). Study shows the distribution of socio-economic status of the respondents. In attempted suicide group 45.8% were in the middle class, 38.9% were in the lower class and 15.3% were in the upper class of socio-economic status. Whereas in the control group, 49.2% were in the middle class, 38.9% were in the lower class and 11.9% were in the upper class of socio-economic status. The socio-economic status of the both groups was almost identical ($p=0.852$). Study shows the distribution of the respondents according to type of family. In attempted suicide group 74.6% were

in the joint family and 25.4% were in the nuclear family. Whereas in the control group, 81.4% were in the joint family and 18.6% were in the nuclear family by their type of family. There was no statistically significant difference between the attempted suicide group in relation to the type of family ($*p=0.506$). Study shows the distribution of patients according to marital status of the respondents. In attempted suicide group, 39% of patients were married, 55.9% were unmarried, 1.7% were widow/er and 3.4% divorce. Whereas in control group, 42.8% of respondents were married, 50.8% were unmarried, 3.4% were widow/er and 3.4% were divorced. The difference between the two groups in relation to marital status was not statistically significant ($p=0.906$). The difference between the two groups in terms of occupation was statistically almost similar ($p=0.871$). The difference between the two groups in relation to educational status was not statistically significant ($p=0.720$). Study shows the distribution of respondents according to their social background. In attempted suicide group, 72.9% of patients were rural and 27.1% were urban by social background. Whereas in the control group, 76.3% of patients were rural and 23.7% were urban by social background. The difference between the two groups in relation to social background was not statistically significant ($p=0.833$). We found in attempted suicide group co-morbid Psychiatric disorder was found in 69.5% of the respondents and in the control group it was only 13.6%. Study shows association of co-morbid psychiatric disorder. In attempted suicide group co-morbid psychiatric disorder was present 69.5% and absent in 30.5%. In control group psychiatric disorder was present 13.6% and absent in 86.4%. The difference between the groups in terms of co-morbid psychiatric illness was statistically significant ($p<0.001$). Study shows co-morbid specific psychiatric disorder.

Table-I: Background characteristics of the study participants (n=118)

Age group in years	AS group (n=59)		Control group (n=59)		P- value
	N	%	N	%	
Age group in years					
11-20	22	37.3	17	28.8	0.729
21-30	29	49.1	30	50.8	
31-40	5	8.5	6	10.2	
41-50	0	0.0	0	0.0	
51-60	2	3.4	5	8.5	
61 or above	1	1.7	1	1.7	
Total	59	100.0	59	100.0	
Sex					
Male	24	40.7	27	45.8	0.710
Female	35	59.3	32	54.2	
Total	59	100.0	59	100.0	
Socio-economic status					
Higher class	9	15.3	7	11.9	1.000
Middle class	27	45.8	29	49.2	
Lower class	23	38.9	23	38.9	
Total	59	100.0	59	100.0	
Family type					

Joint	44	74.6	48	81.4	0.506
Nuclear	15	25.4	11	18.6	
Total	59	100.0	59	100.0	
Marital status					
Unmarried	33	55.9	30	50.8	0.906
Married	23	39	25	42.4	
Widow/er	1	1.7	2	3.4	
Profession					
Student	20	33.9	13	22.0	0.871
House wife	11	18.6	11	18.6	
Service	1	1.7	2	3.4	
Business	4	6.8	5	8.5	
Cultivator	3	5.1	2	3.4	
Day labour	1	1.7	2	3.4	
Unemployment	12	20.3	14	23.7	
living status					
Urban	16	27.1	14	23.7	0.833
Rural	43	72.9	45	76.3	
Total	59	100.0	59	100.0	

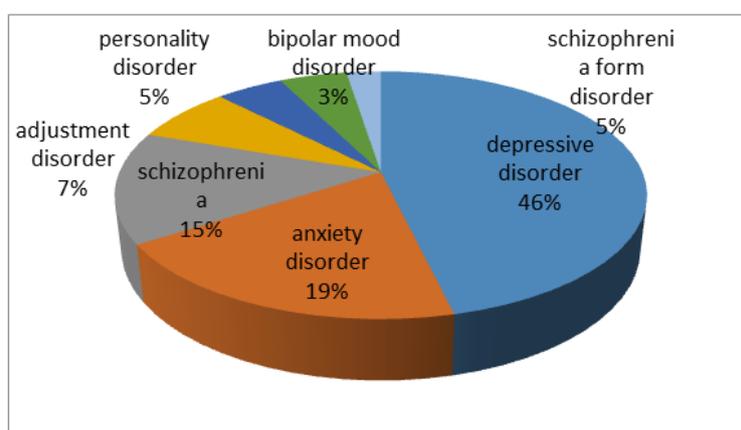


Fig-I: Distribution of suicide attempters with psychiatric disorder (n=59)

Table-II: Association of co-morbid psychiatric disorder (n=118)

Co-morbid Psychiatric disorder	AS group (n=59)		Control group (n=59)		* p value
	n	%	n	%	
Present	41	69.5	8	13.6	<0.001
Absent	18	30.5	51	86.4	
Total	59	100.0	59	100.0	

Table-III: Distribution of respondent on co-morbid specific psychiatric disorder (n=118)

Psychiatric disorder	AS group (n=59)		Control group (n=59)	
	n	%	N	%
Major depressive disorder	19	32.2	2	3.4
Adjustment disorder	3	5.1	1	1.7
Anxiety disorder	8	13.6	4	6.8
Personality disorder	2	3.4	1	1.7
Schizophrenia	6	10.2	0	0.0
Schizophrenia form disorder	2	3.4	0	0.0
Bipolar mood disorder	1	1.7	0	0.0
No psychiatric disorder	18	30.5	51	86.4
Total	59	100.0	59	100.0

AS; Attempted suicide

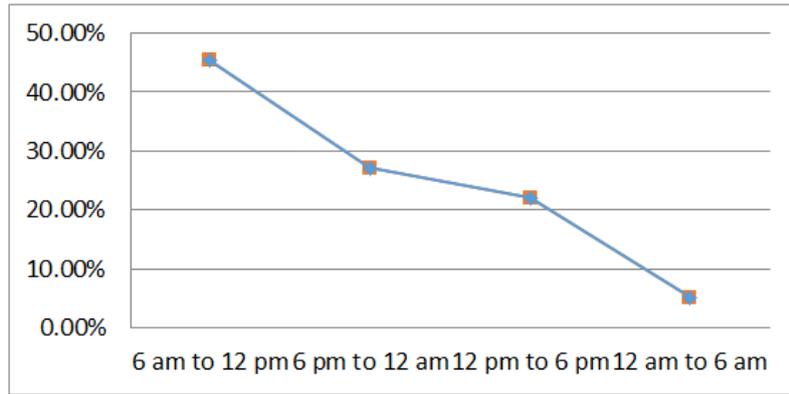


Fig-II: Distribution of respondents according to time of attempted suicide (n=59)

Table- IV: Distribution of respondents according to family history of psychiatric disorder and past history of psychiatric illness (n=59)

Characteristics	%
Family history of psychiatric disorder	
Yes	15.30%
No	84.70%
past history of psychiatric illness	
Yes	15.3%
No	84.7%

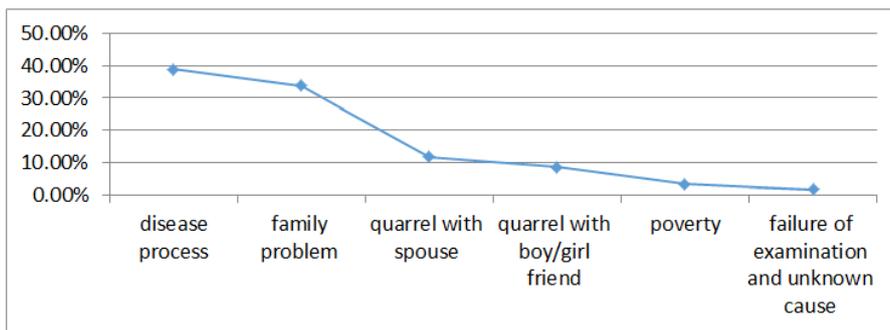


Fig-III: Distribution of respondents in term of causes of suicide (n=59)

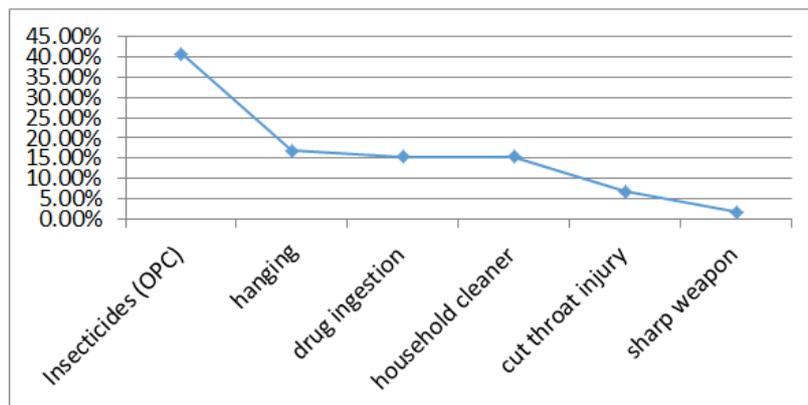


Fig-IV: shows the distribution of respondents on the basis of methods of attempted suicide

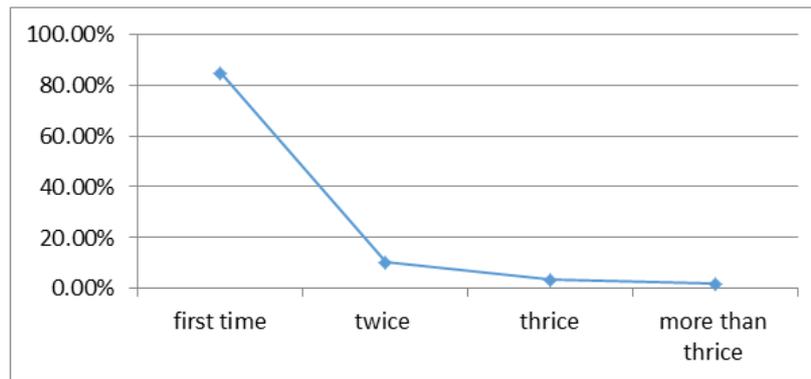


Fig-V: Distribution of respondents according to the number of attempted suicide (n=59)

DISCUSSION

This was a cross sectional descriptive and comparative study conducted in the Department of Psychiatry, Sylhet MAG Osmani Medical College Hospital, Sylhet, Bangladesh during the period from Januarys 2009 to December 2009 with a view to evaluate psychiatric morbidity among the patients with attempted suicide. For this purpose 59 patients of attempted suicide were selected according to inclusion and exclusion criteria and categorized as attempted suicide (AS) group. Age and sex matched 59 healthy control were also selected and categorized as healthy control group. The results of the study were discussed below: The age of the patients was ranging from 12 to 62 years. It was comparable to the study of Baby *et al.* [3] that the age of the subjects ranged from 14 to 82 years. The mean age of the patients was 23.542 ± 8.918 years in this study. The present study found that 40.7% of attempted suicide patients were male and 59.3% were female. These findings were consistent with the study of Ali *et al.* [7] that 45.6% were male and 54.4% were female in their attempted suicide patients. It may be because the behavioral norms in most societies allow boys to express their feelings more openly. For example, boys can express their aggression by fights, whereas girls are expected to keep their feeling to themselves. At times of stress, hurting themselves offers the girls a way to show their distress. The current study showed that 39% of patients were married, 55.9% were unmarried, 1.7% were widow/er and 3.4% was divorced. This result was supported by Meimandi and Nakhaee [18] that 33.3% were married and 66.75 were unmarried, but was differed from Narang *et al.* [12] that married 50% and single 50% among their series. In attempted suicide group, 32.2% had their educational status of secondary level, 23.7% had passed the SSC, 22.0% were in primary level, 11.9% were illiterate, 8.5% had passed the HSC and 1.7% were graduate or above educational level. In this regards Srivastava *et al.* [19] found that 55.5% were illiterate 23.3% were primary, 19.7% were secondary and 1.5% were higher secondary by educational status among their attempted suicide patients. In attempted suicide group, 33.9% of respondents were student, 20.3% respondents were unemployment, 18.6% respondents were house wife,

11.9% others, 6.8% were business man, 5.1% were cultivator and service holder and day labourer each comprises 1.7%. In this study it was found that 72.9% of suicide attempters lived in rural area and 27.1% in urban area. Andrus *et al.* [20] found that among their suicide attempters 19.8% lived in urban, 40.3% in rural and 39.8% in suburban. Among the suicide attempters in the present study, 74.6% were lived in the joint family and 25.4% in nuclear family. Narang *et al.* [12] observed 46% were lived in the joint family and 54% in nuclear family among their series. In this study it was found that 15.3% attempted suicide had the positive family history of psychiatric disorder. This result was similar to the study of Yamada *et al.* [21] that 13.7% of suicide attempters had a family history of suicide or attempted suicide. In the present study the most of the respondents attempted suicide between 6 am to 12 pm (45.5%), others between 6 pm to 12 am (27.1%), 12 pm to 6 pm (22.0%) and 12 am to 6 am (5.1%). Ali *et al.* (2005) found attempted suicide was most frequently between 13 to 18 hours (41.2%), others between 7 to 12 hours (32.4%), 19 to 24 hour (17.6%), and 0 to 6 hours (8.8%). In this study, disease process (39.0%) was the most frequent cause of attempted suicide, followed by family problem (33.9%), quarrel with spouse (11.8%), quarrel with boy/girlfriend (8.5%), poverty (3.4%) and failure of examination and unknown cause each comprises 1.7% of the respondent. Other studies also found nearly similar results. Kurihara *et al.* [22] found interpersonal problems with spouses (20.0%), a boy/girlfriend (6.7%) and family members like parents, brothers, sisters and others (28.3%). Ali *et al.* [7] found family problem (41.2%), love disappointment (11.8%), marital problem (11.8%) and financial problem (5.9%). Insecticides (40.7%) was the most common method used in attempted suicide in this study, followed by hanging (16.9%), drug ingestion (15.3%), household cleaner (15.3%), cut throat injury (6.8%), jumping, stab injury and cutting by sharp weapon each comprises (1.7%). In current study, the number of attempted suicide was first attempt in 84.7% of respondents, second attempt in 10.2%, third attempt in 3.4% and more than three attempts only 1.7% of the respondents. Yamada *et al.* [21] found that the attempted suicide was first time in 56.4%, second time 22.5% and third times

or above in 21.1%. The present study showed that among the attempted suicide patients co-morbid psychiatric disorder was 69.5%. This result was supported by Kurihara *et al.* [22] and Ali *et al.* [7] and Narang *et al.* [12]. Kurihara *et al.* [22] found a significantly higher prevalence of psychiatric disorders (80.0%) in attempted suicide patients. Ali *et al.* [7] found 65.4% of suicide attempters had co-morbid psychiatric disorder. Narang *et al.* [12] observed 57.0% of suicide attempters had co-morbid psychiatric disorder. In the current study, the most common co-morbid psychiatric disorder was major depressive disorder (32.2%), followed by anxiety disorder (13.6%), schizophrenia (10.2%), adjustment disorder (5.1%), personality disorder (3.4%), schizophreni form disorder (3.4%) and bipolar mood disorder (1.7%). There was no associated psychiatric disorder in 30.5% patients. These findings were supported by Kurihara *et al.* [22] that the most prevalent disorder was major depressive episode (51.7%), followed by schizophrenia and other psychotic disorders (15.0%; schizophrenia, schizophreni form disorder, psychotic disorder due to epilepsy, psychotic disorder due to auditory impairment), substance-related disorders (6.7%; alcohol abuse and other substance abuse), adjustment disorders (6.7%), and anxiety disorders (3.3%). An association of co-morbid psychiatric disorder in suicide attempters was determined in the present study and showed that psychiatric disorder was most frequent in suicide attempters and there was a highly significant difference in psychiatric morbidity in the present series with suicide attempters as compared to healthy control ($p < 0.001$) who were similar to the experimental group in age, gender and social status.

Limitations of the study

The study was carried out in a small scale, so it may not reflect the actual picture. Since the study conducted in one selected tertiary level hospital only, the study result may however differ from other hospitals and may not reflect the actual situation of the country.

CONCLUSION AND RECOMMENDATIONS

Attempted suicide is an increasing burden on medical and psychiatric services. In this study co-morbid psychiatric disorder was present in 69.5% of suicide attempters but in healthy control group it was only 13.6%. In conclusion, suicide attempters had more common co-morbid psychiatric disorder than healthy control ($p < 0.001$) who were identical to the age and gender which strongly supports the hypothesis. To conduct a more detailed study on suicide attempters, using standardized measures with multicentre involvement. Such a study might focus especially on young attempters, particularly with regard to their psychological characteristics. Social investigation in the general populations regarding attitudes towards attempted suicide should be conducted. The findings of

such a study may help in prevention of suicidal behavior. Identifying, treating and managing risk individuals with a mental disorder with suicide attempt are a very important intervention for prevention of further attempts. Proper medication, improvement and strengthening of liaison psychiatry practice, counseling, family support and readjustment to life situations are essential in these situations. Skills in resolving family and other conflicts can be taught in schools according to WHO's suicide-prevention resources for teachers. Developing and implementing suicide prevention programs require a basic understanding of the problem risk groups, pattern, methods and causes at national and local levels.

REFERENCES

1. Gelder M, Harrison P and Cowen P. Shorter Oxford Text Book of Psychiatry. 5thedn. Oxford University Press. New York.2006.
2. Kumar PNS. An analysis of suicide attempters versus completers in Kerala. Indian Journal of Psychiatry. 2004; 46(2), 144-149.
3. Baby S, KF Y. Psychiatric diagnosis in attempted suicide. Calicut Medical Journal. 2006; 4(3).
4. World Health Organization. Assessment of iodine deficiency disorders and monitoring their elimination: a guide for programme managers.2007.
5. Perkins DF, Hartless G. An ecological risk-factor examination of suicide ideation and behavior of adolescents. Journal of Adolescent Research. 2002 Jan; 17(1):3-26.
6. De Jong MD, Thanh TT, Khanh TH, Hien VM, Smith GJ, Chau NV, Cam BV, Qui PT, Ha DQ, Guan Y, Peiris JM. Oseltamivir resistance during treatment of influenza A (H5N1) infection. New England Journal of Medicine. 2005 Dec 22; 353(25):2667-72.
7. Kessler RC, Borges G and Walters EE. Prevalence and risk factors for lifetime suicide attempts in the National Co-morbidity Survey. Archives of General Psychiatry. 1999; 56, 617-26.
8. Blackmore ER, Munce S, Weller I, Zagorski B, Stansfeld SA, Stewart DE. Psychosocial and clinical correlates of suicidal acts: results from a national population survey. British Journal of Psychiatry. 2008;192, 279-284.
9. Sarbassov DD, Guertin DA, Ali SM, Sabatini DM. Phosphorylation and regulation of Akt/PKB by the rictor-mTOR complex. Science. 2005 Feb 18; 307(5712):1098-101.
10. Hawton K, Houston K, Haw C, Townsend E, Harriss L. Comorbidity of axis I and axis II disorders in patients who attempted suicide. American Journal of Psychiatry. 2003 Aug 1; 160(8):1494-500.
11. Mann JJ. A current perspective of suicide and attempted suicide. Annals of internal medicine. 2002 Feb 19;136(4):302-11.

12. Narang RL, Mishra BP, Nitesh M. Attempted suicide in Ludhiana. *Indian journal of psychiatry*. 2000 Jan;42(1):83.
13. Galfalvy H, Oquendo MA, Carballo JJ, Sher L, Grunebaum MF, Burke A, John Mann J. Clinical predictors of suicidal acts after major depression in bipolar disorder: a prospective study. *Bipolar Disorders*. 2006 Oct;8(5p2):586-95.
14. Grootenhuys M, Hawton K, Van Rooijen L, Fagg J. Attempted suicide in Oxford and Utrecht. *The British Journal of Psychiatry*. 1994 Jul;165(1):73-8.
15. Tamam Y, Tamam L, Akil E, Yasan A, Tamam B. Post-stroke sexual functioning in first stroke patients. *European Journal of Neurology*. 2008 Jul;15(7):660-6.
16. Coşar B, Kocal N, Arikan Z, Işık E. Suicide attempts among Turkish psychiatric patients. *The Canadian Journal of Psychiatry*. 1997 Dec;42(10):1072-5.
17. Owens C, Owen G, Lambert H, Donovan J, Belam J, Rapport F, Lloyd K. Public involvement in suicide prevention: understanding and strengthening lay responses to distress. *BMC Public Health*. 2009 Dec;9(1):308.
18. Meimandi MS, Nakhaee N. Urgency of Suicide Attempts in Ravar (Iran): A Psycho-socio-cultural Investigation. *Journal of Applied Sciences*. 2005 Oct; 5:1850-3.
19. Greicius MD, Srivastava G, Reiss AL, Menon V. Default-mode network activity distinguishes Alzheimer's disease from healthy aging: evidence from functional MRI. *Proceedings of the National Academy of Sciences*. 2004 Mar 30; 101(13):4637-42.
20. Andrus JK, Fleming DW, Heumann MA, Wassell JT, Hopkins DD, Gordon J. Surveillance of attempted suicide among adolescents in Oregon, 1988. *American Journal of Public Health*. 1991 Aug; 81(8):1067-9.
21. Yamada M, Okada Y, Yoshida T, Nagasawa T. Purification, characterization and gene cloning of isoeugenol-degrading enzyme from *Pseudomonas putida* IE27. *Archives of microbiology*. 2007 Jun 1;187(6):511.
22. Kurihara T, Kato M, Reverger R, Tirta IG. Risk factors for suicide in Bali: a psychological autopsy study. *BMC public health*. 2009 Dec;9(1):327.