

# The evaluation of mood condition among depressed adolescent students in Isfahan after 6 years

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## Abstract

**Background:** This study has carried out to find the recovery rate, depression recurrence, changing of diagnose into bipolar mood disorder (BMD) and appearing other psychiatric disorders including obsessive compulsive disorder, oppositional defiant disorder (ODD), substance induced disorders, attention deficit and hyperactivity disorder, and anxiety disorders after 6 years among students having major depression disorder in Isfahan and its relation to some demographic factors.

**Materials and Methods:** In this historical cohort study, 278 students studying in guidance school, in 2006 being 11–16-year-old and were diagnosed to have major depressive disorder participated. Data collection was done by completing children depression on inventory, Young Maria Rating Scale and also final diagnosis determination through interview by psychiatrists. To analyze the data, in addition to use descriptive statistics, multinomial and multiple logistic regressions were used to evaluate the relationships. All the analyses were done using SPSS 20.

**Results:** About 34.9 of adolescents have suffered from depression after 6 years. Depression in 12.2% has been changed into BMD. The BMD morbidity chance was less in girls rather than depression one. The ratio of drug abuse in girls was less than boys (odds ratio [OR] = 0.471,  $P = 0.046$ ). Students received no treatment or only pharmacotherapy, were more caught by ODD in comparison with those cases who received both pharmacotherapy and psychotherapy ( $P = 0.005$ , 0.038 and OR = 4.29 and 5.88).

**Conclusion:** About half of students after 6 years are caught by depression or BMD. It reveals the importance of this disorder and its role in making behavioral problems for adolescents in their future.

**Key Words:** Adolescent, depression, Isfahan, mood condition, students

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**Received:** 15.05.2014, **Accepted:** 13.01.2015

Access this article online	
Quick Response Code:	Website: <a href="http://www.advbiores.net">www.advbiores.net</a>
	DOI: 10.4103/2277-9175.183142

## INTRODUCTION

Depression is one of the oldest diseases being known and also the most prevalent ones among mental disorders. It was believed that depression did not exist among children and adolescents or at least was so rare up to two last decades. However, recent studies have revealed that these people may also suffer from this

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**How to cite this article:** Shakibaei F, Alikhani M, Mahaki B, Sichani NK, Tabatabaei HD. The evaluation of mood condition among depressed adolescent students in Isfahan after 6 years. *Adv Biomed Res* 2016;5:94.

disorder.<sup>[1,2]</sup> Nowadays, depression is considered as an important mental problem in this age group, among different societies, especially, in developed countries.<sup>[1]</sup>

Some statistical figures show that depression is one of the commonest mental problems among adolescents so that 20–35%, 12–15% and 5% of them have mild, average and sever kinds of this disorder, respectively.<sup>[3]</sup> It is estimated that 7% of children before maturity period, 28% of the people referring to children and adolescent psychiatric clinics and 27% of adolescent patients admitted in psychiatric wards have depression.<sup>[4]</sup>

This disorder affects different aspects of adolescents' life such as their educational function and social relations. It also may lead to some destructive and long-term impacts on adolescents' life such as juvenile delinquency behaviors, aggression, and oppositional defiant disorder (ODD), conduct disorder, antisocial behaviors, escape from home, drug abuse and smoking, several disorders and maladjustment, restlessness, feeling to be unsafe, mental confusion at home, having problems in relating to his/her peers, rejecting any responsibilities, disqualification, ignorance parents expectations and suspiciousness to other people. This disease caused also educational problems such as lacking concentration and incentive in studying, not doing homework, being fired or escape from school.<sup>[5,6]</sup> The researchers in (National Institute of Mental Health) believe that the contradictions of depression can be found apparently among 8% of adolescents.<sup>[7]</sup>

Different studies being conducted about mood disorders' course and prognosis show that they are prone to become chronic, and the patients may experience recurrent attacks. Approximately, 40% of children and adolescents experience the second episode of depression during a 3-year period, and about 75% of them experience it during a 5-year period. Those adults are having recurrent episodes of depression experienced the disorder from adolescence period.<sup>[4,8]</sup>

In addition, depression syndrome of adolescents is a potential risk factor to occur mental disorders, especially, bipolar mood disorder (BMD) in adulthood. Although most of the patients having BMD are treated, only 50% of those ones with major depressive disorder (MDD) received treatment.<sup>[9]</sup> Since depression affects adolescents severely with a high possibility of recurrence in adulthood and being caught by BMD in future, many researchers have studied depression disorder and its specifications among adolescents. Conducted studies in developing countries show that depression prevalence in adolescents has been

increased in recent year. Some researchers also believe that this disease is diagnosed and treated very less than expected.<sup>[10]</sup>

Since the efficiency of therapeutic measures in adolescents' depression is very necessary and at the same time, more than Iranian population are young people, the essentiality to do more qualified studies about this issue is crucial. This can lead to prevent from socio-behavioral and educational problems among adolescents. It also causes to diagnose BMD earlier and plan therapeutic measures. The changes in their depression should be studied in a long period of time so that consequent contradictions of depression are controlled as far as possible. These continuous investigations can result in finding new alternatives and follow-up their effectiveness as preventive measures in the first and second levels of prevention cares for adolescents.

This study has done to find the recovery rate, depression recurrence, changing of diagnose into BMD and appearing other psychiatric disorders (such as obsessive compulsive disorder [OCD], ODD, substance induced disorders, attention deficit and hyperactivity disorder [ADHD], and anxiety disorders) after 6 years among students having major depression disorder in Isfahan and its relation to some demographic factors.

## MATERIALS AND METHODS

This study is a cross-sectional one in which the students studying in guidance school, from both sexes, in 2006 and being 11–16-year-old participated. They also lived in Isfahan city and were diagnosed to have MDD in Shakibaie *et al.* study, which is regarded as the basic study of the present project.<sup>[11]</sup> They monitored 706 students, with the condition told above, (353 depressed and 353 not depressed ones) through simple sampling method. 353 students being diagnosed as MDD cases in preliminary study, by Kiddy-SHDs Depression questionnaire, were studied in the present study.<sup>[12]</sup> 278 students, out of 353 ones participated in this study. The rest of them were excluded because of following reasons: Taking mood elevating medicines from 1-week before study beginning if Young Mania Rating Scale score was more than 20, not being interested in participating by themselves or their parents, moving to other regions and suffering from any sever forms of diseases.

Data collection were done by use of Shakibaie *et al.* results (the first phase of study), and completing Maria-Covaxes depression test (children depression on inventory), Young Maria Rating Scale by psychologists

and also final diagnosis determination through interview by pedagogical psychiatrists.

Children depression on inventory has 27 questions, every which has three answers including 0, 1, and 2. The scores' range of this scale is from zero to 54. The scores from zero to 8, 9–19 and 20–54 represented healthy people, those who are near to be depressed and depressed ones, respectively.<sup>[13]</sup> The validity of this scale was affirmed and also its reliability was also accepted by Kronbach's Alpha and through split-half methods. They were, in turn, 0.81 and 0.91.

Young Mania Rating Scale is an instrument to find the mania severity and revised by Young in 1978. This scale has 11 questions every, which has the statements consisting of some descriptions about the major mania signs. It was provided from patients' individual report of his/her clinical condition during last 48 h. This report was affirmed by officials as well. Every question, in fact, assesses abnormal severity for each patient related to its own content. Additional data can be achieved by clinical observation during the interview. The range of this scale scores is from 0 to 60. The more scores represent a higher level of mania. Scores more than 10 is considered as unusual elevated mood. Validity and reliability of this questionnaire have been affirmed in Shabani *et al.* study.<sup>[14]</sup>

Other psychiatric diagnoses, which have been mentioned before (OCD, ADHD, ODD, etc.), were found among students by the psychiatrist through constructed interview on the basis of Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). The achieved results were shown in a checklist.

The studied cases were called to participate in the project by the cooperation between psychiatric sector of Isfahan school of medicine and Isfahan education department. First of all, the psychiatrist described all aspects of the study such as the goals and the expected achievements to students or their families completely. Then, all studied cases were wanted to give their written acceptance to participate in this project. In the next step, students' demographic data were registered.

To analyze the data, in addition to use descriptive statistics, the relation between present studied cases moods, drug abuse, OCD, ODD, ADHD and anxiety disorders morbidity with their living place and treatment type were investigated using multinomial logistic regression or multiple logistic regressions. All the analyses were done using SPSS 20, IBM Corp. operation 2011. In all statistical tests,  $P < 0.05$  was considered as statistical significance.

## RESULTS

First of all, gender, living place and treatment type of studied cases were analyzed [Table 1].

Then, frequency distribution of adolescents' morbidity to those disorders, which were monitored by psychiatrist through constructed interview and according to DSM-IV criteria, was determined in Table 2.

The frequency of studied cases' present situation is shown in Table 3. The relation of studied cases present situation with gender, living place and treatment type were investigated by use of multiple multinomial logistic regressions [Table 4]. The results demonstrated that there was a significant relation between their gender and present situation ( $P = 0.035$ ). The BMD morbidity chance was less in girls rather than depression one ( $P = 0.018$ ), odds ratio [OR] = 0.373).

Finally, the frequency of drug abuse, OCD, ODD, ADHD and anxiety disorders with Living area, gender and treatment type were studied by multiple logistic

**Table 1: The frequency distribution of studied students' gender, living place and treatment type**

Variable	Group	Frequency (%)
Gender	Female	149 (53.6)
	Male	129 (46.4)
Living place	Area 1	180 (64.7)
	Area 2	98 (35.3)
Treatment type	Without treatment	176 (63.3)
	Pharmacotherapy	34 (12.2)
	Psychotherapy	42 (15.1)
	Pharmacotherapy and psychotherapy	26 (9.4)

**Table 2: The frequency distribution of studied students' morbidity to MDD, changing depression to BMD, drug abuse, OCD, ODD, ADHD and anxiety disorders**

Variable	Group	Frequency (%)
MDD	No	181 (65.1)
	Yes	97 (34.9)
BMD	No	244 (87.8)
	Yes	34 (12.2)
Drug abuse	No	243 (87.4)
	Yes	35 (12.6)
ODD	No	250 (89.9)
	Yes	28 (10.1)
OCD	No	245 (88.1)
	Yes	33 (11.9)
ADHD	No	236 (84.9)
	Yes	42 (15.1)
Anxiety disorders	No	232 (83.5)
	Yes	46 (16.5)

MDD: Major depressive disorder, BMD: Bipolar mood disorder, OCD: Obsessive compulsive disorder, ODD: Oppositional defiant disorder, ADHD: Attention deficit and hyperactivity disorder

regressions This relationships among these two sets of variables were shown in Tables 5 and 6, respectively.

The results showed that there was a significant relation between gender and drug abuse. The ratio

**Table 3: The frequency of mood conditions in groups of living area, gender and treatment type**

Predictor	Recovery (%)	BMD (%)	MDD (%)	Total (%)
Living area				
Area 1	95 (52.8)	23 (12.8)	62 (34.4)	180 (100.0)
Area 2	52 (53.1)	11 (11.2)	35 (35.7)	98 (100.0)
Sex				
Female	75 (50.3)	13 (8.7)	61 (40.9)	149 (100.0)
Male	72 (55.8)	21 (16.3)	36 (27.9)	129 (100.0)
Treatment				
Without	91 (51.7)	23 (13.1)	62 (35.2)	176 (100.0)
Pharmacotherapy	18 (52.9)	3 (8.8)	13 (38.2)	34 (100.0)
Psychotherapy	23 (54.8)	4 (9.5)	15 (35.7)	42 (100.0)
Pharmacotherapy and psychotherapy	15 (57.7)	4 (15.4)	7 (26.9)	26 (100.0)
Total	147 (52.9)	34 (12.2)	97 (34.9)	278 (100.0)

MDD: Major depressive disorder, BMD: Bipolar mood disorder

of drug abuse in girls was less than boys (OR = 0.471  $P = 0.046$ ). In addition, treatment type affected ODD morbidity significantly ( $P = 0.034$ ). The results also showed that those students received no treatment or only pharmacotherapy, were more caught by ODD significantly in comparison with those cases who received both pharmacotherapy and psychotherapy ( $P = 0.005$ , 0.038 and OR = 4.29 and 5.88). These findings are, in turn, used to compare the group receiving no treatment, pharmacotherapy and receiving both treatments.

## DISCUSSION

This study showed that 214 cases (76.9%) out of 278 ones had at least one of the mentioned psychiatric disorders (MDD, BMD, ODD, ADHD, drug abuse and some of anxiety disorders). The most prevalent ones were depression, anxiety disorders and ADHD (34.9, 16.5 and 15.1%), respectively.

This study showed that 214 (76.9%) cases out of 278 ones, had at least one of the mentioned psychiatric

**Table 4: The results of multiple multinomial logistic regression to study the relation between mood condition and gender, living place and treatment type**

Mood condition	B*	Wald	P	OR	95% CI for OR	
					Lower	Upper
Recovery						
Area (1)	-0.03	0.01	0.902	0.966	0.56	1.66
Gender (female)	-0.50	3.40	0.065	0.607	0.36	1.03
Treatment (no)	-0.51	0.69	0.407	0.666	0.25	1.74
Treatment (pharmacotherapy)	-0.42	0.51	0.473	0.656	0.21	2.08
Treatment (psychotherapy)	-0.29	0.27	0.606	0.746	0.24	2.27
BMD						
Area (1)	0.06	0.02	0.893	1.06	0.45	2.47
Gender (female)	-0.98	5.61	0.018	0.373	0.16	0.84
Treatment (no)	-0.48	0.50	0.48	0.618	0.16	2.35
Treatment (pharmacotherapy)	-0.88	0.95	0.33	0.414	0.07	2.44
Treatment (psychotherapy)	-0.67	0.63	0.429	0.51	0.10	2.71

\*Coefficient of effect of the parameter in the model. OR: Odds ratio, CI: Confidence interval, BMD: Bipolar mood disorder

**Table 5: The frequency of drug abuse, OCD, ODD, ADHD and anxiety disorders in groups of living area, sex and treatment type**

Predictor	Drug abuse (%)	ODD (%)	OCD (%)	ADHD (%)	Anxiety disorder (%)
Living area					
Area 1	24 (13.3)	18 (10.0)	24 (13.3)	29 (16.1)	30 (16.7)
Area 2	11 (11.2)	10 (10.2)	9 (9.2)	13 (13.3)	16 (16.3)
Gender					
Female	13 (8.7)	15 (10.1)	15 (10.1)	22 (14.8)	26 (17.4)
Male	22 (17.1)	13 (10.1)	18 (14.0)	20 (15.5)	20 (15.5)
Treatment					
Without	23 (13.1)	14 (8.0)	16 (9.1)	30 (17.0)	35 (19.9)
Pharmacotherapy	4 (11.8)	2 (5.9)	7 (20.6)	0 (0)	2 (5.9)
Psychotherapy	5 (11.9)	5 (11.9)	6 (14.3)	7 (16.7)	7 (16.7)
Pharmacotherapy and psychotherapy	3 (11.5)	7 (26.9)	4 (15.4)	5 (19.2)	2 (7.7)
Total	35 (12.6)	28 (10.1)	33 (11.9)	42 (15.1)	46 (16.5)

OCD: Obsessive compulsive disorder, ODD: Oppositional defiant disorder, ADHD: Attention deficit and hyperactivity disorder



**Table 6: The results of multiple logistic regression to study the relation between drug abuse, OCD, ODD, ADHD and anxiety disorders, and gender, living place and treatment type**

Predictor	B*	SE	Wald	P	OR	95% CI for OR	
						Lower	Upper
Drug abuse							
Area (1)	0.11	0.39	0.08	0.774	1.120	0.52	2.43
Gender (female)	-0.75	0.38	3.97	0.046	0.471	0.23	0.99
Treatment (no)	0.12	0.66	0.03	0.856	1.127	0.31	4.10
Treatment (pharmacotherapy)	0.05	0.82	0.00	0.947	1.056	0.21	5.26
Treatment (psychotherapy)	0.12	0.78	0.02	0.878	1.127	0.24	5.24
ODD							
Area (1)	-0.06	0.43	0.02	0.892	0.944	0.41	2.18
Gender (female)	-0.03	0.41	0.01	0.938	0.969	0.43	2.17
Treatment (no)	-1.46	0.52	7.72	0.005	4.290	1.53	11.59
Treatment (pharmacotherapy)	-1.77	0.85	4.32	0.038	5.880	1.10	31.25
Treatment (psychotherapy)	-1.00	0.65	2.37	0.124	0.367	0.10	1.32
OCD							
Area (1)	0.33	0.42	0.62	0.433	1.390	0.61	3.16
Sex (female)	-0.41	0.38	1.14	0.285	0.665	0.32	1.41
Treatment (no)	-0.60	0.61	0.99	0.321	0.548	0.17	1.80
Treatment (pharmacotherapy)	0.37	0.69	0.28	0.595	1.445	0.37	5.62
Treatment (psychotherapy)	-0.03	0.70	0.00	0.963	0.968	0.24	3.85
ADHD							
Area (1)	0.27	0.37	0.56	0.456	1.313	0.64	2.69
Sex (female)	0.00	0.34	0.00	0.996	1.002	0.51	1.96
Treatment (no)	-0.13	0.54	0.06	0.807	0.877	0.31	2.52
Treatment (pharmacotherapy)	-19.77	0.01	0.00	0.998	0.000	0.00	
Treatment (psychotherapy)	-0.16	0.65	0.06	0.803	0.851	0.24	3.04
Anxiety disorders							
Area (1)	0.10	0.35	0.08	0.780	1.101	0.56	2.16
Sex (female)	0.20	0.33	0.36	0.548	1.221	0.64	2.34
Treatment (no)	1.11	0.76	2.12	0.146	3.025	0.68	13.44
Treatment (pharmacotherapy)	-0.30	1.04	0.08	0.774	0.742	0.10	5.66
Treatment (psychotherapy)	0.86	0.85	1.04	0.308	2.366	0.45	12.41

\*Coefficient of effect of the parameter in the model. OCD: Obsessive compulsive disorder, ODD: Oppositional defiant disorder, ADHD: Attention deficit and hyperactivity disorder, SE: Standard error

disorders (MDD, BMD, ODD, ADHD, drug abuse and some of anxiety disorders). The most prevalent ones were depression, anxiety disorders and ADHD.

This showed that more than one-third of adolescents have suffered from depression even after 6 years. It also reveals the importance of this disorder and its role in making behavioral problems for adolescents in their future. The results of this study is rather the same as Levinson *et al.*,<sup>[15]</sup> Emsley *et al.*,<sup>[16]</sup> Covax *et al.*,<sup>[17]</sup> Dilasver *et al.*,<sup>[9]</sup> Iso *et al.*,<sup>[18]</sup> and Rebergem *et al.*<sup>[19]</sup> researches. All of them found that most of their studied adolescents caught by depression and other behavioral disorders during follow-up period. Jhonson *et al.*,<sup>[20]</sup> Harrington *et al.*<sup>[13]</sup> and Brimahr *et al.*<sup>[21]</sup> studied natural period of chronic and episodic depression in adolescents and came to this conclusion that the adolescents are having long-term depression, are prone to being caught by more chronic and episodic types of depression.

Since the prevalence of depression especially among adolescents have been accelerated so that the risk of recurrence is so high in next years, considering health and educational programs and policy-makings is very essential.<sup>[22-24]</sup>

Moreover, depression in 12.2% of people has been changed into BMD. In all, about half of people (47.1) after 6 years are caught by depression or BMD. The result of this study is as the same as Radha *et al.*<sup>[25]</sup> study, in which was found that 12.2% of children supposed to be depressed were diagnosed as BMD cases after 18 months. This emphasized the importance of depression in adolescents.

The result showed that the risk of changing BMD into depression was less among girls rather than boys. But the risk of depression was higher in girls. This is in accordance with Molavi *et al.*<sup>[26]</sup> and Molavi *et al.*<sup>[27]</sup> results. The present study's results did not show any

significant relations between the present situation of cases and treatment type. This is not as the results of Radha *et al.*<sup>[25]</sup> and Aghaei *et al.*<sup>[28]</sup> studies, in which a significant relation was seen between changing the morbidity of BMD and treatment situation. The reason of this could be due to the ambiguity of persistent treatment follow-up during 6 years and possibility to discontinue or not to take serious treatments.

Since gender affected drug abuse and girls had less level of this disorder significantly, the findings have been affirmed by the other studies' results.<sup>[29]</sup>

The impact of received treatment on those ones being caught by ODD and also significantly lower morbidity of this disorder among students receiving both pharmacotherapy and psychotherapy in comparison with those ones receiving no therapy or only one kind of therapies, proves that psychotherapy has a unique role to prevent from this disorder in adolescents. Aghaei *et al.* project affirmed this finding as well.

One of the limitations of present study was to monitor only depressed adolescents without any control group. It is recommended to do next projects by cohort method and following-up the condition of both depressed and their healthy peers at the same time.

It would be better to study depressed adolescents longitudinally and through repeated measurements.

Since the data in all aspects, were not recorded, only gender, living place and treatment type variables were considered as predictive factors. It is necessary to involve other variables such as demographic, economic and social ones, which are important for adolescents and their families in the model.

Another limitation of this study was to monitor a few categories of disorders. Hence, it is suggested to measure broader range of behavioral disorders and follow-up them.

It sounds that more precise instruments must be used to achieve more reliable data about the disorders. In addition, it is necessary to apply standard questionnaires, diagnostic and constructed psychiatric interviews for some variables.

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**Source of Support:** Nil, **Conflict of Interest:** None declared.