

Prevalence of Depressive Symptoms in Turkish Adolescents



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ABSTRACT

Aim: To determine the prevalence of depressive symptoms in adolescents and explore the association of socio-demographic factors with depression.

Methods: A cross-sectional study was performed in the city center of Konya, Turkey, and included all of seventh grade children in primary schools with census method. The mean age of participants was 13.6 ± 0.7 (range 12 to 16). The data were collected with self-administered Children's Depression Inventory (CDI) which contains 27 items, and socio-demographic questionnaire in classrooms.

Results: Of the 7602, 9.9% second part elementary school students reported depressive symptoms. There were relationships between adolescent depression and gender (OR= 2.35 for girls), age (OR= 1.67 for $15 \leq$), low school performance (OR= 2.11), smoking of father (OR= 1.27), chronic disease of mother (OR= 1.71), chronic disease of father (OR= 1.49), family income (OR= 1.44 for poor), and father's profession (OR= 0.69 for self-employed). Depression rate was 22.9% among the children who had lost their mother and 19.1% on the child whose parents were separated. Depression ratio was low in children whose fathers were self-employed professionals (8.4%).

Conclusion: In adolescence period, especially girls and their parents should be educated about depression and the children's school performance should be improved. The economic status of poor families and health services should be strengthened. With the help of school guiding services, the fathers who smoke should be warned.

Key words: Depression, adolescent, children, CDI, demography, school.

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INTRODUCTION

Depression is one of the most prevalent psychiatric disorders and depression often begins in adolescence (1). It has been reported that the prevalence of depression in adolescents ranged between 9.0% and 18.8% (1-3). Child depression is highly co-morbid with other psychiatric disorders, including anxiety, attention-deficit/hyperactivity disorders, and conduct disorders (4). Adolescents may experience negative attributions, sub-clinical symptoms, and impairment of inter-personal relationships and social functioning (5) after recovering from depression. Depression in adolescents may be associated with long-term problems in social life. Depressed children are at increased risk for affective disorder in adult life and have increased risk of psychiatric hospitalization and psychiatric treatment (6).

Adolescent depression is related to various factors. It is seen more often in girls (7,8) and older adolescents (7,9). Adolescents' depression has also been associated with family environment such as parental death and divorce (10,11). It has been also related to socioeconomic level and school performance (12,13).

Many of the studies about adolescent depression are from western communities. Although these studies have noted cross-cultural differences in childhood depression (1-3,14), there is no adequate information about prevalence of depression in adolescent population in Turkey except the study of Toros et al (15).

The present study aims to determine the prevalence of depressive symptoms in a population of adolescents from central Anatolia (Turkey) by using The Children's Depression Inventory (CDI) and to assess the relation between depression and socio-demographic properties via school based survey.

MATERIAL and METHODS

Subjects

This study was carried out in Konya that is the fourth big province of Turkey at Central Anatolia. The province has the largest surface area of the country, 38,132 km². The province consists of 31 districts, and three of them are in the center of the metropolis of Konya. The total population of the province is 2,192,166, with 742,690 of them in the metropolis according to the official population census of 2000 (16).

The study group consisted of 7927 Turkish children attending the seventh grade in Konya and coming

from suburban and urban areas. Of the schools, 19% belonged to the suburban area and 81% to the urban area. Three hundred and twenty-five children (a percentage can be given here; 95.9% of total) were absent in the classrooms when the questionnaires were administered.

Study group consisted of 7602 children whose age 13.6 ± 0.7 (range 12 to 16) years, 60.1% were boys and 39.9% girls.

The socioeconomic status (SES) was assessed by the families, whether they have washing machine, PC, car, e.g. by socio-demographic questionnaire. Sequentially, 10.1% of the subjects came from very poor families, 35.7% from low SES families, 23.0% from medium SES families, and 18.1% from upper SES families.

Instruments

The children's depression inventory: The Children's Depression Inventory (CDI) for children aged 7-17 was devised by Kovacs based on the Beck Depression Inventory (17). The scale's assumption is that child depression can be described through some symptoms as adult depression. CDI is a commonly used self-report measure of depression symptoms in children. Twenty-seven multiple-choice items assessed the severity of depressive symptoms during the previous two weeks. Higher scores (min= 0; max= 54) represent more severe depression and scores below 19 are considered to be normal. The scale is widely used and it has been demonstrated to have good concurrent validity and reliability (Cronbach's alpha 0.80) in Turkey (18).

Socio-demographic questionnaire: A questionnaire was constructed according to the purpose of the study. The children were asked 25 questions including age, gender, parents' status (alive/died, intact/divorced), parents' profession, smoking or alcohol consumption of parents, whether the parents have any chronic illness, number of brother/sister, order of birth, school performance the last year according to average of points.

Procedure

To apply CDI on schoolchildren, the permission was taken from Province Administrator of Ministry of Education and teachers of guidance in each school. In addition, families of children were informed about inventory by posting an informative paper. Children without parents' consent were not included into the study.

In the present study, the Turkish version (18) of the CDI by Kovacs (16) was used. In order to limit time consumption, the inventory was collectively administered to the subjects in the same classroom during regular classroom lessons. The examiner followed the manual's standard instructions. Children were asked to complete the questionnaire in their classrooms. Children were told to answer the inventory only themselves and not to write their names on inventory. The teacher and research assistant (H.K.) were always available to help children if necessary and to ensure independent and confidential responding.

Statistical Analysis

The Statistical Package for the Social Sciences (SPSS for Windows v.14) program was used for the statistical analyses. Score of depressive symptoms or having depressed to CDI was dependant variable in this study. The CDI score divided according to the cutoff, into: "at a risk of depression" (CDI \geq 19, marked 1) and "not at risk" (CDI < 19, marked 0). All of the socio-demographic features such as children's gender, age, settlement, school performance, number of siblings, birth sequence, parents' profession, economic level, parents' smoking or alcohol consumption were evaluated as independent variables.

Data from the inventory and survey were coded and transferred to a PC. Min-max, empty code, variance and average controls were made. Data were summarized as percentage, mean \pm standard deviation. Comparisons on categorical variables were carried out by using chi-square test (Table 1 to 3), while Student's t test was used to compare mean of age. Spearman rank correlation was used for the determination of relationship between CDI scores and age, school performance, number of sibling, and sequence of birth. The logistic regression analysis was then applied to assess the socio-demographic properties effects on depressive symptoms.

RESULTS

In this study 4592 (60.4%) of the participants were male, and 3010 (39.6%) of them were female. Of them, 87.7% were aged 13 or 14 years. The mean age of children was 13.7 ± 0.8 years in boys and 13.3 ± 0.6 years in girls ($t = 20.9$, $p < 0.001$). The prevalence of depression was 9.9%. This ratio was higher in girls than boys (13.5% and 7.6% respectively) ($\chi^2 = 72.41$, $p < 0.001$). There was a weak positive correlation between CDI score and age for both boys and girls ($r = 0.079$, $p < 0.001$; $r = 0.092$, $p < 0.001$ respectively). However, two way ANOVA showed that CDI score

Table 1. Distribution of children to presence of depressive symptom, age, gender, settlement and school performance (n= 7602).

Variables	No (%)	Children without depression		Children with depression		p*
		n (%)	n (%)	n (%)	n (%)	
Gender:						
						<0.001
Boy	4592 (60.4)	4245 (92.4)		347 (7.6)		
Girl	3010 (39.6)	2603 (86.5)		407 (13.5)		
Age:						
						<0.001
12	274 (3.6)	245 (89.4)		29 (10.6)		
13	3669 (48.3)	3360 (91.6)		309 (8.4)		
14	2996 (39.4)	2675 (89.3)		321 (10.7)		
15	559 (7.4)	485 (86.8)		74 (13.2)		
16	104 (1.4)	83 (79.8)		21 (20.2)		
School performance:						
						<0.001
Superlative deg.	1854 (24.4)	1747 (94.2)		107 (5.8)		
Good degree	1206 (15.8)	1104 (91.5)		102 (8.5)		
Valid degree	4360 (57.4)	3851 (88.3)		509 (11.7)		
Repeated grade	182 (2.4)	146 (80.2)		36 (19.8)		
Total	7602	6848 (90.1)		754 (9.9)		

* Chi-square test.

was affected by age and sex ($F= 13.6$, $p< 0.001$ and $F=2.1$, $p< 0.001$) (Figure 1).

There was no relationship between number of siblings, and birth sequence and depression scores ($r_s= 0.028$, $p= 0.054$ and $r_s= 0.016$, $p= 0.165$, respectively). There was a weak negative correlation between school performance of children and CDI scores ($r_s= 0.182$, $p< 0.001$). The percentage of depressive children living at the urban areas was similar to the suburban areas (Table 1).

There was a relationship between parent's status (alive/dead, together/separated) with childhood depression. Children whose mothers were dead or whose parents were separated had higher depression levels than children whose parents live together (Table 2).

Almost (93.3%) mothers were housewives, except those who were dead. Only 6.7% of the mothers were working or retired. There was no relationship between mother's job status and childhood depression ($p= 0.832$). Children (except those whose father was dead) whose fathers were self-employed had less depression ($p< 0.001$). Economic status of the families was determined according to having modern technology such as PC, dishwasher, washing machine, and car. Children with poor economic status had

higher depression levels than the children with other economical levels ($p< 0.001$) (Table 2). CDI score of the children that have alcoholic fathers, smoking or with chronic illness parents was higher than the others, except whose parents were dead (Table 3).

The factors which had relation with childhood depression according to chi-square analyzes were also evaluated by using backward logistic regression (Table 4). Therefore, there were relationships between childhood depression and gender, age and academic failure of children, smoking status of father, family income, presence of chronic disease in a parent, and profession of father according to this study's methods and conditions (logistic regression, model $\chi^2= 256.8$, $df= 8$, $p< 0.001$, Nagelkerke $R^2= 0.073$).

DISCUSSION

The study's results show that one of the ten Turkish adolescents have depressive symptoms and being girl, older than fourteen, having poor school performance, smoking father, chronically ill parents, and belonging to low economic class increases the risk for depressive symptoms. On the other hand, the children whose fathers are self-employed had depressive symptoms less frequently. In the present study, the socio-demographic risks of depression

Table 2. Distribution of children to presence of depressive symptoms and status of parent, profession of parent and socioeconomic status.

Variables	n	Non-depressive n (%)	Depressive n (%)	P*
Status of parent:				
Alive and intact	7234	6534 (90.3)	700 (9.7)	<0.001
Father died	223	198 (88.8)	25 (11.2)	
Mother died	35	27 (77.1)	8 (22.9)	
Divorced /separated	110	89 (80.9)	21 (19.1)	
Profession of father:				
Self-employed person	3292	3017 (91.6)	275 (8.4)	<0.001
Worker/ Officer	3512	3134 (89.2)	378 (10.8)	
Unemployed/retired	575	499 (86.8)	76 (13.2)	
Economic status of family:				
Upper	1377	1255 (91.1)	122 (8.9)	<0.001
Middle	2748	2488 (90.5)	260 (9.5)	
Low	2712	2447 (90.2)	265 (9.8)	
Poor	765	658 (86.0)	107 (14.0)	
Total	7602	6848 (90.1)	754 (9.9)	

* Chi-square test.

Table 3. Distribution of children to presence of depressive symptoms and status of smoking, alcohol consumption and chronic disease of parent (except dead parents).

Variables		Non-depressive	Depressive	P*
		n (%)	n (%)	
Father' alcohol consumption	No	6255 (90.4)	666 (9.6)	0.004
	Yes	395 (86.2)	63 (13.8)	
Mothers	Nonsmokers	5977 (90.6)	622 (9.4)	<0.001
	Smokers	844 (87.2)	124 (12.8)	
Fathers	Nonsmokers	2307 (91.6)	214 (8.4)	0.004
	Smokers	4343 (89.4)	515 (10.6)	
Mother's chronic disease	Absent	5647 (91.4)	532 (8.6)	<0.001
	Present	1174 (84.6)	214 (15.4)	
Father's chronic disease	Absent	5857 (90.8)	593 (9.2)	<0.001
	Present	793 (85.5)	134 (14.5)	

* Chi-square test.

assessed by the CDI were evaluated in a school population sample of Turkish adolescents. The reliability and validity of instruments to assess pediatric depression is on par with the instruments to assess adult depression (4).

The ratio of depression in the study is harmonious with the other studies (3,13,19). Toros et al. (15) had found that depression prevalence in adolescents was higher in a coastal city in southern Turkey. Unlike Toros et al's study, the present study was performed on the adolescents from central Anatolia.

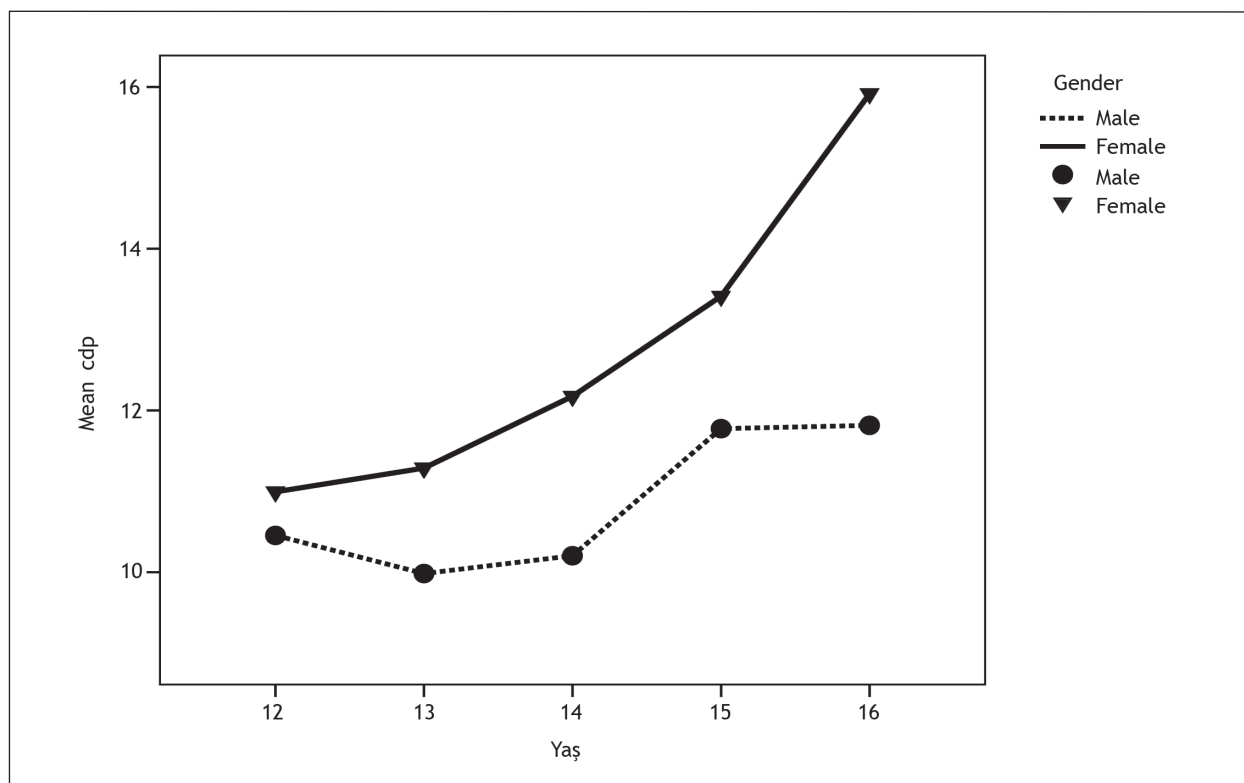


Figure 1. Means of CDI scores according to gender and age in adolescents.

More accurate prevalence results of Turkish children will be available by performing studies in different regions. This study may represent Turkish children better than the study from coastal city, because central Anatolian population is harmonious with Turkey average with respect to demographic statistics (16).

Higher depression levels in girls (Table 1) can be explained by reasons like earlier puberty than boys, spoiled hormonal balance, having more difficulties than boys in these years and handicaps while coping with these difficulties because of gender. Some other researchers (3,15,20-23) also pointed out the high frequency of depressive symptoms in adolescent girls. Gender difference in tendency to depression starts to appear at the age of 12-13 according to the studies (7,8,24). In addition, female gender was significantly related to severity of initial depression (25). Early maturation may lead to greater body dissatisfaction resulting in increased risk for depression for girls (26).

The reason of correlation between CDI score and increased age (Table 4) may be related to the intensive puberty or school problems (27). The older children for the seventh class may have started to school late or may have repeated a class because of failure. Success may reduce depression in children. Girls have higher increase of depression together with increased age than boys (7,8,24).

There is no relationship between being depressive and number of siblings according to the study. There is also no relationship between birth sequence of children and tendency to depression. But, it is shown that in some studies (3,28) larger family size is related to adolescent depression.

Failure in school increases tendency to depression

(Table 1) and vice versa. Failure in school can accelerate depression by triggering problems with family, lack of desire to school and conflicts with teachers. Son and Kirchner (12) and Toros et al (15) have declared that there is a relationship between poor school performance and depression in children and adolescents. CDI score is also high in school refuses (29) and in school problems. Maladaptive attributional patterns are also significantly associated with depressive symptoms in children and adolescents (24,27,30).

There is no difference in the ratio of depressive symptoms according to living at urban and suburban settlement. Some studies (31-33) also found that there was no difference in level of depression across urban and suburban samples.

Children whose mothers were dead or whose parents were separated or divorced have an increasing tendency to depression. It was reported that there were familial influences on child depression (22). Losing mother may increase tendency to depression. Likewise, in some articles (11,24,34) it has been shown that death of any parents or relatives may increase depressive symptoms in children. In contrast, this study showed that death of father has no direct increasing effect on depression. Besides, some authors (10,21,35,36) have noted to the link between parental separation/divorce and depressive or problem behavior symptoms.

The relationship between working status of mothers and level of depression was not clear because mothers of most children were housewives. However, children with self-employed fathers have fewer tendencies to depression. Father's profession could directly affect socio-economic level. Poverty was effective on depressive symptoms in children (Table 2). Poverty and dif-

Table 4. Results of the multivariate logistic regression analyses related to depressive symptoms.

Variables	Sig.	OR (95% confidence interval)
Gender (girl)	<0.001	2.30 (1.95 - 2.70)
School performance (low)	<0.001	2.11 (1.77 - 2.52)
Age (15≤)	<0.001	1.72 (1.35 - 2.21)
Mother's chronic disease	<0.001	1.71 (1.43 - 2.05)
Father's chronic disease	<0.001	1.49 (1.20 - 1.84)
Profession of father (Self-employed)	<0.001	0.69 (0.59 - 0.82)
Family income (poor)	0.003	1.44 (1.14 - 1.82)
Being smoker of father	0.006	1.27 (1.07 - 1.51)
Constant	<0.001	

difficulties in meeting necessities force child to compare himself with others. This situation increases child's tendency to depression. A lot of studies (5,13,24,37,38) showed that low economic status increases depression. It can be concluded that low economic status leads to depression via deprivation. In addition, high economic status leads to depression via lack of satisfaction. In fact, it has alleged that there is no effect of socio-economic status on child depression (8).

There was no relationship between alcohol consumption status of parents and adolescent depression. However drinking problem of fathers generally damage mental health of children (39,40). Despite the ineffectiveness of parents' drinking habit, children with smoking father have more depressive symptoms. Father's tobacco use is a negative pattern for children and it increases substance dependence in family. Therefore, it prepares the background for depression. Some studies (3,32) showed that parental smoking or anyone else smoking in household are related to childhood depression. However, a study (41) found that maternal or paternal smoking is not related to depressive symptoms of adolescents.

The children of chronically ill parents have higher level of depression. Parents can have difficulties on concerning about their children for a long time when they have chronic disease. Illness of the parents can increase the responsibilities of children in terms of housework. Children who normally need emotional support have to support parents and cannot tolerate this stress. The relationship between somatic illness and depressive symptoms is known (7,24). Parental illness also may increase depressive symptoms in their children.

As a conclusion, girls must be prior to boys in guidance and counseling because of their higher tendency to depression. Therefore, adolescent children and their families should be educated about problems of this period. Study grants or bank loans to children of poor families can decrease depression levels. Unsuccessful and depressive children should be inspected one by one and the source of problem should be found. Psychological counseling and supervisors in the schools and psychologists should care individual differences and their status. Children with depressive symptoms should be taken to do the management of a psychiatrist/ psychologist. To determine depressive children early, there should be a depression scale near general health information in student's file and children with depression risk should be ob-

served periodically. Children who lost their parents or whose parents were separated or whose parents smoke should take psychological support. These results should be supported by further analytic studies.

Authors' Contribution

SB designed the study, analyzed the data, and wrote the paper. HK contributed to the study design, and collected the data.

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