Assessment of Depression and Risk Factors using Beck Depression Inventory in High School Students

Bir Lisede, Öğrencilerin Beck Depresyon Envanteri İle Depresyon ve Risk Faktörlerinin Değerlendirilmesi

Sarp Üner, PhD.
Department of Public Health
Hacettepe University Medical Faculty
sarpuner@hacettepe.edu.tr

Hilal Özcebe, PhD.
Department of Public Health
Hacettepe University Medical Faculty
hozcebe@hacettepe.edu.tr

Abstract
Purpose: This study is structured with an aim to evaluating relation between mental health of high school students and some socio-demographic properties and risky behaviors. **Material and Methods:** The universe of the cross-sectional type study consists of the junior and senior students (1st and 3rd grade) of a high school in downtown area, Ankara. The sampling group consists of 494 students. A questionnaire which consists of students' socio-demographic properties, risky behaviours and. Beck Depression Inventory is used. **Results:** By the model formed using logistics regression analysis, the probability of the depression increases by age in the adolescence group. Being female,having a partner,expressing own health bad or very bad, carrying a fire arm, imposing violence, exposing violence within the family and having a chronic illness in family are under more serious threat. **Conclusion:** In this study, depression prevalence is very high and different programs with special approaches such as providing consultation and educational services in order to protect and improve health of adolescents outside the school are needed. Determining the students with depressive risk factors, providing consultancy services and monitoring these services should be included in the school health programs.

Key Words: **Adolescent; Beck Depression Inventory; Depression; Risk factors.**

Özet
Amaç: Bu çalışma Ankara'da bir lisenin öğrencilerinin Beck Depresyon Envanteri ile değerlendirilmesi, sonuçların bazı sosyodemografik özellikler ve riskli davranışlarla ilişkilerinin belirlenmesi amacıyla planlanmıştır.
Gereç ve Yöntemler: Kesitsel tipteki araştırmanın evrenini Ankara kent merkezinde yer alan bir lisenin birinci ve üçüncü sınıf öğrencileri oluşturmaktadır. Örneklem büyüklüğünün 494 öğrenci olarak belirlendiği araştırmada öğrencilerin sosyodemografik özelliklerini, risk alma davranışlarını ve Beck Depresyon Envanterini içeren anket formu kullanılmıştır. **Bulgular:** Oluşturulan modele göre ergenlerde yaşla birlikte depresyon tanısı alma riski artmaktadır. Kız öğrenciler, flörtü olanlar, kendi sağlıklarını kötü ya da çok kötü olarak değerlendirenler, okula giderken silah taşıyanlar, şiddet uygulayanlar, ailesinden şiddet görenler ve ailesinde kronik hasta olanlar daha fazla risk altındadır.
Sonuç: Bu araştırmada depresyon görülme sıklığı oldukça yüksek olup, bu dönemde depresyon bulguları ve risk faktörleri değerlendirmesi ergen sağlığının geliştirilmesi ve koruyucu ruh sağlığı açısından önem taşımaktadır. Ergenlerin fiziksel, ruhsal ve sosyal olarak sağlığın korunması ve geliştirilmesi yaklaşımı bulundukları eğitim kurumlarında eğitim ve sağlık sektörlerinin işbirliği ile yürütülebilir.

Anahtar Sözcükler: **Beck Depresyon Envanteri; Ergen; Depresyon; Risk faktörleri.**

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Corresponding Author:
Sarper Üner, PhD.
Department of Public Health
Hacettepe University Medical Faculty
Ankara, Türkey

Telephone : +90- 312 305 15 90
E-mail : sarpuner@hacettepe.edu.tr

Introduction

Depression which is one of the most widespread mental disorders that decrease the life quality of a person, is characterized by an emotional status including the feeling of calmness, insignificancy, impotency, reluctance, moodiness along with slow down of speech and motions. Depression which starts with factors like genetic or biochemical reasons, environmental conditions and psychosocial constraints is a mental disease that can be seen at every age (1, 2).

In the puberty period which is the transition phase between juvenility and maturity, a rapid physical, sexual and mental development and change are experienced and it is very well known that many behaviors regarding life style settle in this period. Adolescent acquire some risky habits in terms of their health during this phase of creating life style like tobacco, alcohol and drug use, unsafe sexual life, actions that may lead to accidents and violence, irregular and unbalanced diet. Risk taking actions in this period impact the mental health of the person negatively. (3–12).

Depression which is an important public health problem takes the 4th position in women and 9th position in men among the first 20 disease that forms the disease load in Turkey (13). Depression during the pubertal period is so important as it has the potential onset of adult depression and as it is more risky in terms of suicidal attempts of the person. With the accompaniment of motivation-orientation and expression liabilities, teenager depression takes a different appearance than the adult depression and frequently seen behavior disorders may cause the table to be similar to personality pathology. In research carried out during the last years, it was determined that frequency of depression symptoms in the puberty period is between 8–20% and twice in women than men (1, 14, 15).

In the studies, the idea of hurting one is very frequent and the suicide attempt and frequency is very high in depression (1, 15, 16). In the world and also in Turkey, between the ages of 15–24, the second reason of death is suicide and its rate gradually increases (1, 17). 35% of suicides in Turkey and approximately half of the women that commit suicide (46.4%) are at this age group (17). It is very important that these problems of the teenagers who demonstrate depression symptoms are revealed before committing suicide.

Even in situations where depression symptoms are mild, it makes the person unhappiness, ineffectiveness and passivity and also decreases life quality. So it is so important to reach people who demonstrate these symptoms and depression risk groups in terms of mental health. Depression which has an efficient, simple and cheap treatment must be determined and intervened on time and this creates an opportunity for students to be healthier and more efficient throughout their education life and in the future.

This study is aimed to assess the Beck Depression Inventory (BDE) in high school students and to determine its association with some social-demographical features and risky behaviors.

Materials and Method

First and third grade students of a high school at the city center of Ankara were included in this cross-sectional study. In 2004–2005 education period, when the research was carried out, there were 820 students at the first grade and 814 students at the third grade. Sample size is determined with "Calculation of sample size where population is known" formula. In this calculation "$t_{1-\alpha}$" (at a specific confidence level generally %95, the value to be found for the highest independency level) is accepted as 1.96; "p" (the prevalence of a case in society, probability) as 0.20 and "S" (Standard deviation) as 0.05. Size of scale that represents the population separately for each class is calculated. Minimum sample size was calculated as 494 in total (247 for the first and third grade students).

During the research, a questionnaire form that covers social-demographical features and risk taking behaviors of students and families was used. Also with "health concept" question of General Health Questionnaire, the purpose was to learn health realization condition of teenagers and their questions regarding violence and being exposed to violence and their violence approach.

Reliability and validity of BDE scale used to measure the depression of the students which is the first developed by Beck and his colleagues (18) is demonstrated by Hisli (19, 20) in our country and it can be applied teenager age group (19–22). BDE is a scale composed of 21 articles. Each item determining a behavioral feature regarding depression under the scale is assigned a score between 0 (never) to 3 (frequently) and as a result the person receives a score of 0–63 and high scores demonstrate increase in

depression symptoms. Hisli recommends that proper cut point of the BDE score to determine clinical depression is "17" (19).

The questionnaire was filled by 16 high school first grade and 16 high school 3rd grade students selected randomly in the same course hour in six first grade and third grade. It lasted approximately 30 minutes and out of 544 students in 12 branches selected 523 has participated in the study (96.2%). Significent difference between study group and the students who did not participate (n=21) was not determined in terms of age and gender.

Chi-square test was used for frequency distribution of the data; independent samples t-test was used for comparison of independent groups. Logistic regression analysis was also used. In order to relate BDE depression findings of students and possible risk factors the following criteria has been added to the model formed with "Binary Logistic Regression -Backward Conditional" method: class, age, gender, social security, having a boyfriend/girlfriend, assessing one's own health, tobacco and alcohol consumption, carrying weapon while attending school, using violence, being exposed to violence by his/her families or friends, chronic disease or mental disease in the family.

Written consent of National Education Directorate of the Province and school administration was taken and students were informed about the content of the questionnaire and confidentiality of the information. All students were all notified for not accepting without their consent and not writing their name and they were also requested to record their Id numbers written on the questionnaire. At the end of the study, Id numbers of students who were under risky group were stated and the students who applied were directed to Adolescent Psychological Consultancy Center in a health center at the region with the help of their guidance counselor.

Results

Two hundred sixty eight out of 523 students who participated in the study (51.2%) were high school third grade students. Mean age of high school first grade students, and high school 3 students was 14.4±0.7 and average age of is 16,3±0,7 and girls compose half of the study group (50,5%) (Table I).

When health insurance of students are observed SSI (33,1%) composes the biggest group and family of one out of every five student does not have health insurance. The people that 10.7% of the participants live with have chronic diseases and 4.2% of these have mental disease. Majority of the students (73,5%) assess their health as good or very good and one out of every four student does not believe that their health is good (Table I).

Half of the students had flirting experience. 9.2% of the research group smoke regularly and 4.4% of these consume alcohol. 14.1% of the students carry a small weapon with them to school, 21.4% of these use violence against their friends and 16.3% of these are exposed to violence by their friends and almost half of these (44,7%) are exposed to violence by their family (Table I)

BDE average score of students who participate in the study is calculated as 12,37±9,14 (0–49). BDE average scores of high school first grade students is 11,24±9,04 and third grade students is 13,44±9,13. According to average of the scored received under BDE, the difference between two groups is examined with "T Test in independent groups" and the difference is found meaningful significantly (t=2,77; p=0,00).

Difference between groups of the students according to their courses (p=0,03), age (p=0,01) and gender (p=0,00) are found statistically significant. Among high school first grade students (23,6%) the ones between age of 14 and below (18,6%) and the male students (20,8%) with age of 17 and above had lower scores. (Table I)

The students whose family have chronic (p=0,00) or mental disease (p=0,00) are determined to have high percentage of taking a score of 17 and more and the difference between groups are statistically meaningful. In the group who assess their health as very good the percentage of students who achieved a score below 17 reached 85.8% and this percentage is much lower (p=0.00) among the group of students who evaluated their health as bad (14.3%) (Table I).

The percentage depression diagnosis according to BDE of students who had flirting experience within the last year is higher compared to other students and the difference between is found statistically meaningful (p=0,00). More than half of the students who use tobacco and alcohol has scored 17 or above and the scores of these students were higher compared to other students (p=0,00). Almost half of the students who carry weapons to school, who apply violence to their friends and who are exposed to violence by their families and friends have been diagnosed with depression according to BDE (p=0,00) (Table I).

Table I. Distribution of Beck Depression Inventory (BDE) Depression Diagnosis according to some qualities of students who participated in the study.

Parameters		BDE <17 * (n=376)	BDE ≥17 * (n=146)	Total** (n=522)	p =
Class					0,03
	9	76,4	23,6	48,7	
	11	67,9	32,1	51,3	
Age					0,01
	≤ 14#	81,4	18,6	33,0	
	15	66,7	33,3	14,4	
	16	68,3	31,7	38,7	
	≥ 17	65,8	34,2	14,0	
Sex					0,00
	Famale	65,0	35,0	50,4	
	Male	79,2	20,8	49,6	
Health Assurance					0,01
	None	65,2	34,8	21,5	
	Public Servant#	91,4	8,6	11,1	
	Goverment Retiremat Fund	66,7	33,3	9,8	
	Social Insurance Institation	69,4	30,6	33,1	
	Social Security Organization For Astisaus and the Self Emplayed	77,0	23,0	16,7	
	Green Card	66,7	33,3	4,0	
	Private Insurance	75,0	25,0	3,8	
Chronic Illness in Own Family					0,00
	None	74,2	25,8	89,3	
	Yes	53,6	46,4	10,7	
Mental Illness in Own Family					0,00
	None	73,2	26,8	95,8	
	Yes	45,5	54,5	4,2	
Self Assessment Own Health					0,00
	Excellent#	85,8	14,2	27,0	
	Well	76,4	23,6	46,4	
	Average#	55,0	45,0	23,0	
	Bad#	25,0	75,0	2,3	
	Very Bad#	14,3	85,7	1,3	
Flirtation					
	No	80,9	19,1	52,1	0,00
	Yes	62,4	37,6	47,9	
Smoking					0,00
	None#	84,1	15,9	57,7	
	Only Experience	57,1	42,9	25,5	
	Give Up Smoking	60,0	40,0	7,7	
	User	47,9	52,1	9,2	
Alcohol Addict					0,00
	None#	75,0	25,0	74,3	
	Only Experience	70,5	29,5	18,2	
	Give Up Alcohol	50,0	50,0	3,1	
	User#	43,5	56,5	4,4	
Carrying Weapon					0,00
	No	75,2	24,8	85,8	
	Yes	52,7	47,3	14,2	
Use Violence					
	No	78,0	22,0	78,5	0,00
	Yes	50,0	50,0	21,5	
Be Exposed to Violence					0,00
	No	76,2	23,8	83,7	
	Yes	50,6	49,4	16,3	
Domestic Violence					0,00
	No	82,7	17,3	55,4	
	Yes	58,8	41,2	44,6	
Total*		72,0	28,0	100,0	

*Percentage of line, ** Percentage of column, #Significantly differ from other groups.

According to the answers that students gave to a question about suicide attempts of teenagers under BDE (independent evaluation of this question is not recommended), 312 students who had a score under 17 do not consider suicide (83.0%). However 47.9% students who receive a score of 17 and above (70) marked the following answers: "sometimes I consider of killing myself, but I cannot do such a thing", 11.6% (17) marked "I deeply wanted to kill myself" and 9.4% (14) marked "if I can I shall kill myself".

Variables under Table 1 are added to the logistic regression analysis and the following variables are found significant: age, gender, having a girlfriend/boyfriend, evaluating health, carrying weapon to school, applying violence to friends, being exposed to violence and having chronic disease in the family. The risk of being diagnosed with depression under BDE increases with age [OR=1,27 (1,05–1,56)]. Female students [OR=3,13 (1,91-5,12)] , the ones having girlfriend/boyfriend [OR=1,72 (1,07-2,78)], the ones who evaluate their health as bad or very bad [OR=14,62 (4,44-48,06)], the ones carrying weapons to school [OR=2,81(1,49-5,31)], the ones applying violence [OR=1,89 (1,11-3,23)], the ones exposed to violence by their family [OR=2,46 (1,53-3,96)] and the ones who have chronic disease in their family [OR=2,40 (1,23-4,67)] are under higher risk (Table II).

Table II. Relating Possible Risk factors with Logistic Regression aanalysis and Beck Depression Diagnosis.

Parameters		B	S.E.	p	Odds Ratio (% 95,0 GA)
Constant		-6,91	1,60	0,00	0,001
Age		0,24	0,10	0,02	1,27(1,05–1,56)
Sex					
	Male				1,00
	Famele	1,14	0,25	0,00	3,13(1,91–5,12)
Chronic Illness in Own Family					
	No				1,00
	Yes	0,88	0,34	0,01	2,40(1,23–4,67)
Self Assessment Own Health					
	Exellent and Well			0,00	1,00
	Aveage	1,05	0,25	0,00	2,87(1,75–4,69)
	Bad And Very Bad	2,68	0,61	0,00	14,62(4,44–48,06)
Flirtation					
	No				1,00
	Yes	0,54	0,24	0,03	1,72(1,07–2,78)
Carrying Weapon					
	No				1,00
	Yes	1,03	0,33	0,00	2,81(1,49–5,31)
Be Exposed to Violence					
	No				1,00
	Yes	0,64	0,27	0,02	1,89(1,11–3,23)
Domestic Violence					
	No				1,00
	Yes	0,90	0,24	0,00	2,46(1,53–3,96)

Discussion

Depression in the adolescence period is one of the major health issues. BDE scanning test is also used in Turkey frequently. In reliability study of Turkish form of BDE Cronbach alpha coefficient was determined as 0.74 and it was shown that the form had sufficient reliability (20). It was shown by Hisli that 17 and higher scores determined as cut point under this study can distinguish depression that can be treated with an accuracy of 90% (19). According to BDE scanning test results, the prevalence of depression is 23.6% in high school first grade students and 32.1% in high school third grade students and as 28.0% in general. In the study carried out with BDE, Hisli found that depression prevalence rate was 18.0% among university students (20). In two separate studies carried out in high school students with BDE, depression prevalence rate was determined as 18.9% (23) and 37.2% (24). According to the results of this study one, out of every four students is pre-diagnosed with depression and the depression prevalence rate was very high as being in other studies.

In the study, depression prevalence rate in high school third grade was found to be higher than the first grade students. Pressure due to university entrance test in high school third grade students, concern about future, unemployment and insecurity in life may have caused depression symptoms to increase. In one study, depression levels of high school third grade students were found to be significantly higher compared to 1st and 2nd grade students (25). In another study carried out in Trabzon, it was determined that future concerns related with the test has facilitated outcome of depression symptoms in teenagers at this group (26). Especially in studies carried out in our country with students before they enter the university examination, similar results were obtained (27). The study focused only on depression symptoms and attitudes regarding life style and the relation between school and future plans and depression were not evaluated.

The prevalence of depression increase with age in parallel to other research findings and literature (1, 2, 5, 10). Adolescent period is generally divided into three. Early adolescence period is the period where generally physical growth and psycho-social development starts where there are concerns about physical development of the teenager. However, age of 14–16 is the medium adolescence period where physical growth is accepted and where friends are very important and where abstract Thinking is improved. In adolescence age of 17–19 is late adolescence where the abstract Thinking of the teenager develops and concerns about the future are more intense (28). In this study, it was found that at age of 14 and below where early adolescence period ends and medium adolescence period starts is the period where depression prevalence was the lowest. It was seen that depression increases in the medium adolescence period where the person determines its goals, the fight between the individual and the family about freedom increases and where more intense feelings are experienced. This shows that teenagers have difficulty in coping with the transition period and that university examination test starts to become a point of concern. Even though it is anticipated that age and grade is related with each other, it was seen that age and grade are not related and both variables are added to the analysis. According to results of logistic regression, it was thought that variable that had impact on depression was the age.

There are some findings in the literature showing that depression was more prevalent in female teenagers (1, 2, 5, 29, 30). In evaluations carried out in slow teenagers and the ones who applied to (31) Child and Teenager Mental Health Clinic, it was seen that girls described themselves as more depressive. Results of the research supported these findings and prevalence of depression in female teenagers was 3.13 times compared to the male teenagers. However, different results were obtained in some studies (25, 26).

When evaluating depression and risk factors, tobacco and alcohol consumption which are important indicators of healthy life style was found to be a factor that increases depression frequency, however it was not included in the logistic model. In some research, it was demonstrated that there was a relation between cigarette, alcohol consumption and depression (5, 8, 12, 31–33) and in some research, this data was not supported (7, 34). By evaluating this issue in more different population and sampling groups enables interpreting depression and tobacco-alcohol consumption relation in a more healthy way.

In these studies, relations of the teenagers between two different sexes on emotional level were found as a factor that increases depression frequency. In teenagers who had flirting experience at any period in their life the depression rate was 1.72 times higher, however this relation was not supported in the studies of Altıntaş and his colleagues (23).

In the research, it was determined that there was an important relationship between depression and violence cases. The depression prevalence was higher among the

students who apply violence to his/her friends and who were exposed to violence by his/her family (respectively, 1.89 and 2.46 times). In environments where violence exists we may say that depression is more frequent. There are studies where it was determined that there was a relation between depression and being exposed to violence (29, 35-37). Being exposed to violence in the family or by friends may cause damage of teenagers of self-respect of teenagers. Also there are findings showing that duration and frequency of violence increases depression rate (29, 38). Violence in the family and the relation between sexual violence and depression is stronger (11, 29, 38). Teenagers who feel weak and impotent May reflect this with depressive symptoms and may be more inclined to violence. It was determined that there was a relation between carrying a weapon and depression (OR=2,81). It can be concluded that people with depression may have tendency to violence or the environment that causes the individual to carry weapon may lead to depression.

Another variable that is related with depression is the availability of chronic disease in the family. In the teenagers with a chronic disease in their family, the prevalence of depression is found to be 2.40 times higher. Having a person with a chronic disease at home may impact the psycho-social structure of the person. Along with direct impact on the teenager, impact on family members and corruption of communication with the teenager may be among the consequential factors. However improvement of data existing under this study and determinative researches regarding relation with the chronic disease and depression are necessary.

When teenagers who evaluate their health as very good and good are taken as reference group, depression prevalence according to BDE is found as 2.87 and as 14.62 in teenagers who evaluate themselves as having bad health. In the study carried out by Kim (8) it was seen that teenagers with depression believe they have bad health and that there is a reverse relation between depression and health perception.

According to World Health Organization report (2) it is stated that 40% of the teenagers think of hurting themselves. Under suicide risk factors there are adolescence, violence in the family, physical and sexual abuse, mental disease in the family, alcohol and drug consumption and depression (16, 39, 40). In BDE, only 20 percent of students with a score of 17 and below consider suicide and in students with a score above 17 this rate reaches up to 2/3. Glied and Pine (5) have determined in their study that suicide idea in teenagers with depression diagnosis is 16.59 times higher.

The research has some restrictions. In a research carried out in some grades of a high school in Ankara, the it should be kept in mind that the results of the study represent the high school that the study is carried out in and that it should not be considered as a general result for all high school students. There is no practical index in our country that we can use to determine the socio-economical level in the researches. This makes it hard to determine the social status of the group for which research is carried out and the social status of the research group. This high school where the study is carried out is in a district with medium level of income. However in regards to the social structure of this district, only personal experiences of health managers and researchers can be used. For this reason; during the interpretation of the results of the research, impact of socio-economical structure is avoided as much as possible. Results of this study represent only the teenagers with medium level of income. However there is the possibility of social-economic structure being a factor that impacts the prevalence of depression. For this reason applying the research to teenagers with lower and higher economical levels shall enable better reviewing of coping with transition period.

Cause and effect relation should not be determined in cross-sectional studies. For this reason, the results of this study draw attention to the possible risk factors and give hints on carrying out detailed researches.

The approach of protecting and improving physical, mental and social health of teenagers can be carried out in the education institutions with cooperation of education and health sectors. Rapidly carrying out treatment of teenagers with depression symptoms shall enable integrity of the approach.

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