

Depressive Symptomatology among University Students in Denizli, Turkey: Prevalence and Sociodemographic Correlates

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- Aim** To determine overall and subgroup prevalence of depressive symptomatology among university students in Denizli, Turkey during the 1999-2000 academic year, and to investigate whether sociodemographic factors were associated with depressive symptoms in university students.
- Methods** A stratified probability sample of 504 Turkish university students (296 male, 208 female) was used in a cross-sectional study. Data were obtained by self-administered questionnaire, including questions on sociodemographic characteristics and problem areas. The revised Beck Depression Inventory (BDI) was used to determine depressive symptoms of the participants. BDI scores 17 or higher were categorized as depressive for logistic regression analysis. Student t-test and linear regression were used for continuous data analysis.
- Results** Out of all participants, 26.2% had a BDI score 17 or higher. The prevalence of depressive symptoms increased to 32.1% among older students, 34.7% among students with low socioeconomic status, 31.2% among seniors, and 62.9% among students with poor school performance. The odds ratio of depressive symptoms was 1.84 (95% confidence interval [CI], 1.03-3.28) in students with low socioeconomic status and 7.34 (95% CI, 3.36-16.1) in students with poor school performance in the multivariate logistic model. The participants identified several problem areas: lack of social activities and shortage of facilities on the campus (69.0%), poor quality of the educational system (54.8%), economic problems (49.3%), disappointment with the university (43.2%), and friendship problems (25.9%).
- Conclusions** Considering the high frequency of depressive symptoms among Turkish university students, a student counseling service offering mental health assistance is necessary. This service should especially find the way to reach out to poor students and students with poor school performance.

Depressive disorders are the leading cause of disability worldwide (1). A pan-European study reported the 6-month prevalence of depression of 17% (2). The point prevalence of depressive symptoms in different populations ranged from 13% to 20% and the prevalence of clinic depression in developed countries was 3% for men and 4-9% for women. The prevalence of depressive symptoms in Turkish society varies between

10% and 20% (3,4). Depression is relatively more common among adolescents, with the prevalence of clinic depression up to 28% and is increasing worldwide (5-7).

Studies on risk factors associated with depression have yielded varying results but higher prevalence of depression has nearly always been found in women. Negative association with indicators of socioeconomic status has also been ob-

served (8,9). Persons in the lowest socioeconomic group have twice the likelihood of depression compared with those in the highest socioeconomic group (10). Similar disparities have been demonstrated for adolescents and are linked to alcohol, tobacco, and the use of other drugs (11,12).

During the 1990's, Turkish society passed through a stage of a great social and economic differentiation. This process led to greater social variability and possibly affected the distribution of psychological disturbances in every population subgroup, including the young. Since depression leads to inactivity, inadequacy, and unhappiness, knowing current overall and subgroup prevalence and predisposing factors for depression in young adults helps the professionals to redesign the university mental health services to address this disabling condition. The present study aimed to determine overall and subgroup prevalence of depressive symptomatology in university students in Denizli, Turkey, during the 1999-2000 academic year and to investigate whether sociodemographic factors were associated with depressive symptoms in university students.

Subjects and Methods

Subjects

The study took place in Pamukkale University, Denizli, located in the Egean region, a relatively developed part of Turkey. It was conducted in the second semester of the 1999-2000 academic year at all 4 years of 4 faculties (Economics, Engineering, Education, and Arts and Sciences). The total number of students was 4,757. The sample size calculation, assuming the prevalence of depressive symptoms as $10 \pm 5\%$ with a 99.9% confidence, resulted in 489 subjects. In order to increase the representation of the available faculties and each study year in the sample, we first stratified the sample on faculties and study years, and then randomly selected the students (proportional to the size of each stratum) to get a total of 489 students.

Data Collection

Data were collected by a self-administered questionnaire which consisted of two parts: 1) closed-ended questions on sociodemographic variables, 2) students' perception of several problem areas which negatively affected students' educational experience at the university, which was

estimated by the question "Please indicate three of the most important problem areas which negatively affected your educational experience at the university." There were 8 options listed under this question (Table 2).

Socioeconomic status of a student was measured by the student's ability to pay the school expenses.

The degree of depressive symptoms was measured by Turkish version of the 21-item revised form of the Beck Depression Inventory (BDI, ref. 13). The BDI statements were ranked from 0 to 3, with 0 representing the least serious and 3 the most serious symptoms.

Statistical Analysis

Logistic regression was used to assess the relationship between sociodemographic variables and the symptoms of depression. Bivariate logistic model was calculated by taking each correlate at a time. Sociodemographic factors which were significant at the bivariate modeling or the subject of interest for the researchers were included in a backward stepwise multivariate logistic model. The results are reported as odds ratios (OR) with 95% confidence intervals (CI). In order to minimize the Type 1 error, we ran only one multivariate stepwise linear regression model to check the association between the uncategorized BDI score and several continuous and discrete independent variables. Between-group comparisons for continuous data (problem areas) were computed by means of t-test. The SPSS statistical package (SPSS Inc., Chicago, IL, USA) was used for data analysis.

Results

The mean (\pm standard deviation) age of the participants was 20.4 ± 1.8 . There were 208 (41.3%) female and 296 (58.7%) male participants. Table 1 presents the association of depressive symptoms with sociodemographic factors. The mean BDI score was 12.8 ± 7.2 , with a range between 1 and 47. Out of all participants, 26.2% ($n = 132$) had a BDI score 17 or higher. The prevalence of depressive symptoms among students older than 22 year of age was 32.1% ($n = 25$). The prevalence of depressive symptoms increased with the year of study to 31.2% ($n = 34$). Also, students with low socioeconomic status and with poor school performance showed 34.7% ($n = 25$)

Table 1. Description of the sample and association of depressive symptoms with sociodemographic characteristics in university students (n=504)

Variables†	No. (%) of students	BDI scores* (mean±SD)	Percent of students with depressive symptoms‡	Bivariate model§	
				OR	95% CI
Total	504 (100)	12.8±7.2	26.2	-	-
Age:					
16-18	44 (8.7)	11.7±5.4	25.0	reference	
19-20	217 (43.1)	12.7±7.2	24.4	0.97	0.45-2.03
20-22	165 (32.7)	12.6±7.2	26.1	1.06	0.49-2.27
23>	78 (7.8)	14.5±7.8	32.1	1.41	0.61-3.25
Gender:					
male	296 (58.7)	12.9±6.9	28.0	reference	
female	208 (41.3)	12.8±7.5	23.6	0.79	0.53-1.19
Paternal education:					
uneducated	30 (6)	13.2±6.2	28.9	reference	
primary	188 (37.3)	12.5±6.8	22.3	0.49	0.22-1.12
secondary or high	161 (31.9)	12.9±7.3	25.5	0.57	0.25-1.30
university	125 (24.8)	13.2±7.6	31.2	0.78	0.34-1.80
Residency (longest):					
village	85 (16.9)	13.7±7.3	30.6	reference	
town	139 (27.6)	12.8±7.2	25.9	0.79	0.44-1.44
city	280 (55.6)	12.6±7.2	25.0	0.75	0.44-1.30
Family income:¶					
lowest	41 (8.1)	13.4±6.2	31.7	reference	
low	233 (46.2)	12.7±7.3	23.6	0.67	0.32-1.40
middle	166 (32.9)	12.9±7	27.7	0.82	0.39-1.70
high	57 (11.3)	12.4±8	26.3	0.77	0.31-1.80
do not know	7 (1.5)				
Socioeconomic status:					
high	288 (57.1)	11.88±6.95	21.9	reference	
middle	137 (27.2)	13.84±7.06	30.7	1.58	0.99-2.49
low	72 (14.3)	15.06±7.70	34.7	1.91	1.08-3.30
Attending faculty:					
education	238 (47.2)	13.01±7.18	25.6	reference	
engineering	139 (27.6)	12.65±7.46	26.6	1.05	0.65-1.69
arts and sciences	73 (14.5)	14.45±7.29	31.5	0.75	0.75-2.36
economics	54 (10.7)	10.75±5.87	20.4	1.33	0.36-1.53
Study year:					
freshman	150 (29.8)	11.98±6.86	24.7	reference	
junior	130 (25.8)	12.84±7.07	25.4	1.04	0.60-1.78
sophomore	115 (22.8)	12.96±7.79	24.3	0.98	0.56-1.73
senior	109 (21.6)	14.08±7.07	31.2	1.38	0.79-2.39
School performance:					
high	191 (37.9)	11.34±6.50	18.3	reference	
middle	271 (53.8)	13.07±6.86	26.9	1.64	1.04-2.60
low	35 (6.9)	19.65±9.09	62.9	7.54	3.46-16.4

*Abbreviations: BDI – Beck depression inventory; OR – odds ratio; CI – confidence interval.

†Totals for some variables are lower than 504 because seven students did not respond to them.

‡BDI scores were dichotomized using 17 as the cut-off point. This column shows the percentage of the people with BDI scores 17 or higher.

§The multivariate model comes from a backward stepwise logistic regression analysis. The model started with age, gender, attending faculty, school year, socioeconomic status, and school performance.

¶Classification: lowest=86 million Turkish Liras (TL); low=250 million TL; middle=500 million TL; high=750 and over million TL.

‡Socioeconomic status of students was defined as the student's ability to pay school expenses.

and 62.9% (n=22) of depressive symptoms, respectively. According to bivariate logistic model, the odds of having depressive symptoms were insignificantly higher in students who are older than 22 years, male students, with low paternal education, residing in a village, with low family income, and significantly higher in students with low socioeconomic status and poor school performance (Table 1). The OR of depressive symptoms was 1.84 (95% CI, 1.03-3.28) in students with low socioeconomic status and 7.34 (95% CI, 3.36-16.1) in students with poor school performance in the

multivariate logistic model. Further, when using uncategorized BDI scores in a linear regression model, low socioeconomic status (Beta ± standard deviation = 1.47 ± 0.42, p = 0.001) and low school performance (Beta ± standard deviation = 3.04 ± 0.52, p < 0.001) were significantly associated with depressive symptoms, as well as with the status of freshman (Beta ± standard deviation = 0.82 ± 0.28, p = 0.03). Additionally, the participants identified several problem areas: the lack of social activities and shortage of facilities on campus (69.0%), poor quality of the educational system (54.8%), eco-

Table 2. The number and percentage of students who answered "yes" to problem areas, and the mean scores of the Beck Depression Index (BDI) among the students who answered "yes" and the students who answered "no" to each problem area

Problem areas	No. (%) of students who answered "yes"	BDI score (mean±SD) in students who answered		P *
		yes	no	
Inadequate social life and shortage of the facilities	352 (69.2)	12.92±7.1	12.77±7.3	NS
Poor quality of the educational system	279 (54.8)	12.41±6.5	13.46±7.9	NS
Economic problems	251 (49.3)	13.64±7.2	12.09±7.1	0.01
Disappointments	220 (43.2)	13.13±7.5	12.67±6.9	NS
Friendship problems	132 (25.9)	14.16±7.9	12.41±6.8	0.01
Administrative problems	113 (22.2)	12.60±7.6	12.95±7.0	NS
Accommodation problems	52 (10.2)	12.36±6.4	12.93±7.2	NS
No problem	15 (2.9)	7.66±3.9	13.04±7.2	<0.001

*Student t-test.

conomic problems (49.3%), disappointment with the university (43.2%), and friendship problems (25.9%). Group comparisons showed that average BDI scores were statistically different in the groups reporting economic and friendship problems (Table 2).

Discussion

Our study showed that a quarter of the university students in Turkey had depressive symptoms. Studies done at two large universities in Ankara, Turkey, during the early 1990s showed that the prevalence of depression among intern medical doctors and engineering students was 13.8% and 16.4%, respectively (14,15). Two other studies in mid-1990s specified the prevalence rate at 34.5% and 34.7% (16,17). These findings indicate an increase in depression among young adults in Turkey in the second half of the 1990s. This increasing trend might be explained by differences in the tools, populations, cut-off points, or sampling errors. However, we can speculate that changing environmental factors in the second half of the last decade negatively affected the psychological well-being of young people in Turkey. This information is supported by the data from the State Statistical Institute of Turkey that the risk of suicide increased to 2.42 per 100,000 in 1990 to 3.30 per 100,000 in 1997 (18).

Sociodemographic variables that represent indirect indicators of environmental adversity have been frequently found significantly related to a wide range of child and adolescent psychopathologies (8-10). Unsurprisingly, the relationship between socioeconomic status and depressive symptoms was significant in the current study. In another study, Goodman et al (12) confirmed the linkage between household income and depression: students from schools with higher average household income reported fewer depressive

symptoms than those from schools with lower average household income. In two other studies, there was a relation between financial problems and depression in Turkey (17,19). Student's financial problems may negatively affect students' self-esteem and psychological status.

In the present study, there was negative correlation between school performance and depressive symptoms. Similar results were found in two other cross-sectional studies (19,20). It can be hypothesized that depressed students show symptoms such as reduced concentration, loss of interest, loss of energy, and disorder in sleep pattern. All these could negatively affect students' school performance. Conversely, poor school performance may lead to a decrease in self-esteem and consequently, to the occurrence of depressive symptoms.

The present study indicated a positive association between being senior in the school and depressive symptoms. Similar to our results, another Turkish study showed that freshmen had the lowest average BDI scores (17). There was a positive correlation between study year and the increased average BDI scores. On the other hand, several studies did not find any association between BDI scores and study year (14,16). In another study, freshmen showed more symptoms of depression than the others (20), contrary to our results. These variations may originate from differences in the measurement tools used, time when the study was performed, or sampling errors. However, we think that the workload of the students increases with the study year. Also, depressive symptoms may be more common as a result of student worries about their future as they are approaching graduation.

We did not observe any gender differences in depressive symptoms in our study. We hypothesize that this situation originates from the

fact that female students at our university express themselves better, are more self-confident, and are aware of having equal rights. Similar observations were made in other three studies (14-16). Contrary to our results, significantly more depressive symptoms were found in female students than in male students in two different studies at a Turkish and a Canadian university (17,21).

A limitation of this study is its cross-sectional design. Therefore, it is hard to assess directions of influence and it precludes us from making causal inferences about our findings. However, the sufficient sample size, conducted in a university accepting students from all-over Turkey, and using a valid scale to classify depressive symptoms of the students in the current study increases the validity of the study, and the generalizability of our results to other Turkish university students.

A student counseling service, offering mental health assistance, should be present at the university to address the high frequency of depressive symptoms among university students. This service should find the way to reach out to poor students and the students with poor school performance. Additionally, since the lack of social activities and shortage of student facilities on campus were pointed out as major problem areas, it would be wise that the university administrations invest more into such facilities.

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