ORIGINAL ARTICLE

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Assessment of Mental Health of University Students with GHQ-12

Aims: The aim of this study was to assess the mental health status of university students and the factors affecting their mental health.

Materials and Methods: The universe of the study consisted of a total of 8407 students enrolled as first- or third-year students of a university. The study sample was determined by using the "sampling size where the population in universe is known" formula. The study questionnaire was designed to include questions regarding some sociodemographic characteristics and the General Health Questionnaire (GHQ)-12. Data were analyzed by SPSS 15.0, and binary logistic regression forward selection method was used to determine the variables that could affect GHQ-12 scores.

Results: The study population included a total of 3501 students (males, 36.9%). The majority of the students were 21 years and their mean age was 21.3±2.0 years. "Academic achievement" and "presence of a negative event in the last year" were present in all models of analysis.

Conclusions: These findings indicate the strong impact of these two factors on the mental health of students. The findings of our study can not be generalized for all university students; however, the study variables can guide other researchers in their studies on the mental health status of students.

Key Words: University students, mental health, GHQ-12

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Üniversite Öğrencilerinin Ruhsal Durumunun GSA-12 ile Değerlendirilmesi

Amaç: Bu çalışma, üniversite öğrencilerinin ruh sağlığı durumlarının ve ruh sağlıklarını etkileyen faktörlerin incelenmesi amacıyla gerçekleştirilmiştir.

Yöntem ve Gereç: Çalışmanın evrenini, bir üniversitenin birinci ve üçüncü sınıflarında öğrenim gören toplam 8407 öğrenci oluşturmuştur. Araştırmanın örneklemi, "evrenin bilindiği durumlarda örneklem büyüklüğü" formülü kullanılarak hesaplanmıştır. Çalışmada kullanılan anket formu, öğrencilerin bazı sosyodemografik özellikleri yönelik sorular ve GSA-12'den oluşmaktadır. Veriler SPSS 15.0 programı kullanılarak analiz edilmiş ve GSA-12 puanlarını etkileyen değişkenleri saptamak amacıyla binary lojistik regresyon forward seleksiyon yöntemi kullanılmıştır.

Bulgular: Çalışma grubu 3501 öğrenciden oluşturmuştur (erkekler, % 36,9). Öğrencilerin çoğunluğu 21 yaşındadır ve yaş ortalamaları 21.3±2.0 yıl olarak hesaplanmıştır. Tüm analiz modellerinde "akademik başarı" ve "geçtiğimiz sene içinde olumsuz bir yaşam olayının varlığı" değişkenleri yer almıştır.

Sonuç: Bulgular öğrencilerin ruh sağlıkları üzerinde bu iki faktörün güçlü etkisi olduğuna işaret etmektedir. Çalışmamızın sonuçları tüm üniversite öğrencileri için genellenemez ise de çalışmada yer alan değişkenler, öğrencilerin ruhsal sağlığını değerlendirme çalışmaları sırasında diğer araştırmacılara yol gösterici olabilir.

Anahtar Sözcükler: Üniversite öğrencileri, ruh sağlığı , GSA-12

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Introduction

Both the number and percentage of university students among the general population in Turkey have been gradually increasing. In conjunction with this trend, the health status of this population has come under more focus than ever. Studies on the mental health status of university students have also given rise to increasing concern because the onset of psychiatric illnesses, which often disrupt the completion of developmental and educational tasks of young adults, results in underachievement and unemployment (1). It is well documented that the mental health problems among

today's university cohorts in the industrialized countries are more frequent than observed previously. For example, in the United States, it is estimated that 37% of young adults between the ages of 15 to 24 years have a diagnosable mental disorder, and many of these individuals are college students (2). This fact also applies to British university students. According to Phippen's (3) survey on counseling services in further and higher education, 64% of the 152 counseling services had reported an increase in the proportion of seriously disturbed students.

While in the past, only a small proportion of youth lived away from home to follow an intensive higher education program for several years, today there is a real expansion worldwide in the number of university students studying in a city or a country other than their own. While youth in industrialized countries have greater opportunities for university education, the largest proportion of university students are citizens of transitional and developing countries (4). There is thus an urgent need for collecting data related to the health status and mental health problems of university student cohorts in these countries. As a developing country with one of largest populations of higher education (5.21 million young people (4)) and with one of the largest university student populations in the European region, studies on the mental health status of university students using a methodology carried out on a comparable basis with other countries are highly needed in Turkey.

In this study, our aim was to assess the mental health status of the first- and third-year students in different faculties and colleges of Hacettepe University and the factors affecting their mental health. Psychological distress of the students was assessed by using the 12-item General Health Questionnaire (GHQ), which is designed as a case-finding instrument. The GHQ was chosen as a screening instrument because it is a brief instrument that has been shown to be associated with psychological health problems in primary health care and community settings, and has acceptable levels of sensitivity and specificity for case detection (5). Gaining an understanding of the most important factors affecting the mental health status of Turkish university students and those that may have a cultural basis is one of the most valuable outcomes of this study.

Materials and Methods

The universe of our study consisted of a total of 8407 students enrolled as first- (4392) or third (4015) year students of all the faculties and colleges of Hacettepe University. Hacettepe University is one of the largest universities in Turkey and the enrolled students represent a wide range of socioeconomic levels among the general population.

The study sample was determined by using the "sampling size where the population in universe is known" formula. While calculating the sample size, the prevalence of mental problems among the general population was taken as approximately 20% (originally reported as 17.2% in the Mental Health Study of Turkey).

The size of the study sample was calculated as 1310 first-year and 1278 third-year students. Thereafter, the numbers of students from each faculty and college to be included in the study were calculated so as to represent the respective enrollment numbers of each faculty and college. For practical reasons, different departments of faculties and colleges were included into the study by "random selection method" until the required sample size was reached.

The study questionnaire was designed to include questions regarding some sociodemographic characteristics and lifestyles of the students, the GHQ-12 and the Fagerström Nicotine Dependence Scale. Assessment of the general mental health status of students was conducted via "GHQ-12", which is a scale previously adapted for use in our country. GHQ–12 is a self-administered test originally developed by Goldberg to assess mental health status of individuals in a general population and in primary health care settings. GHQ-12 (5) is a frequently used screening test and was found to be both valid and reliable for use in Turkey. The test's validity and reliability studies for Turkey were conducted by Kilic (Cronbach alpha = 0.78) (6). In our study, where GHQ type scoring (0, 0, 1, 1) is used, the cut-off point was defined as scores "between 1 and 2". Accordingly, those students who scored ≥2 points in GHQ-12 were considered to be at risk for mental problems. Sensitivity and specificity values for the above-mentioned cut-off point were determined as 0.74 and 0.82, respectively (6). Fagerström Nicotine Dependence Scale was used to

measure the level of nicotine dependence in those students identified as having a smoking habit. In 1978, Fagerström had suggested the use of the Fagerström Tolerance Test to measure the level of nicotine dependence. Later, this test was redesigned by Fagerström, Heatherton and Kozlowski to develop the Fagerström Nicotine Dependence Scale (7). This is a self-administered scale composed of six questions, with 10 the highest overall score possible and 0 the lowest. Since this scale's validity tests have yet to be conducted in Turkey, scores between 0 to 4 were classified as "low dependence", and those between 5 to 10 as "medium and high dependence". During further analysis, the students were classified as "non-smoker", "smoker with no dependence", "smoker with a low level of dependence" and "smoker with middle and high level of dependence".

An index was developed to assess students' preferences regarding their leisure time activities. Accordingly, leisure time activities (excluding school work, duties at home and physiological needs such as eating, sleeping etc.) were scored as stated by the students. The index included both the type and the frequency of leisure time activities such as student union activities, sports, cinema, theater, concerts, listening to music, etc.

Data extracted from the study were analyzed by SPSS 15.0. To determine the variables that could be accepted as the main independent variables among the factors affecting GHQ-12 scores, binary logistic regression (LR) forward selection method was used. In this way, modellings were made according to the results of the analysis of the different cut-off points.

The study was conducted after obtaining the written consent of the administrators of the university, faculties, colleges and departments as well as the oral consent of the students. Participants received no incentives for study participation.

Results

The study population included a total of 3501 students (1291 males, 36.9%). The majority of the students were 21 years (24.5%) and their mean age was 21.3±2.0 (16-46) years. First-year students accounted for 52.8% of the study group. The majority of the students were single (94.9%), had health insurance (88.6%), and were members of nuclear families, and only 6.5% of the students revealed their families' economic status level as low. With respect to parental educational level, the majority of the mothers (32.3%) were primary school graduates, while the majority of the fathers (42.7%) were university graduates.

Modelling

The mean GHQ-12 score of students was calculated as 3.2±3.3 (0-12). In order to determine the variables that could be accepted as the main independent variables among the factors affecting the students' mental health, different cut-off points of GHQ-12 scores were taken. The variables that were included in the models as a result of analysis by binary LR forward selection method are shown in Table 1. Among all the variables, "student's opinion of his/her academic achievement" (henceforth "*academic achievement*") and "presence of experiences which had depressed psychosocial well-being in the last year" (henceforth "negative event") were included in the models of all cut-off points.

Model 1

In Model 1, "mental health" was taken as the dependent variable with a cut-off point between 1 to 2 points in GHQ-12 (0-1 points: "no risk"; ≥2: "general health status at risk") and the dependent variable's relation with the two independent variables (academic achievement and negative event) was analyzed by using the binary LR model. Of the study group, 56.8% of the students were found to have scores ≥2 points, which is the cut-off point with the highest sensitivity and specificity for GHQ-12.

According to Model 1, the presence of a negative event was found to increase the risk of having a mental problem by 2.39 (2.07-2.76)-fold. On the other hand, the risk was found to be 1.65 (1.42-1.93)-times more for students who classified their achievement as "medium" and 3.07 (2.45-3.85)-times more for those who classified their achievement as "low" (Table 2).

Model 2

In addition to the main independent variables (negative event and academic achievement), the variables that were previously shown to affect GHQ-12 scores in the literature and those found to be correlated with GHQ-12 scores in our study were also included in the second model. The variables found to have a statistically significant correlation with the GHQ-12 score were selected by forward LR selection method (Table 3). Of

Table 1. Variables included in the model when different GHQ-12 cut-off points were used.

Variables in the Model	GHQ–12 Cut-off Points (% of scores above the cut-off)						
	0–1 (70.8)	1–2 (56.8)	2–3 (46.7)	3–4 (37.2)	4–5 (30.1)	5–6 (23.6)	6–7 (17.9)
Negative event[1]	+	+	+	+	+	+	+
Academic achievement[2]	+	+	+	+	+	+	+
Sex	+	+	+				
Perception of body image		+	+				
Positive event[3]		+	+				
Emotional violence		+	+				
Relation with partner		+	+		+	+	+
Relation with father		+	+	+			
Relation with mother		+	+				
Leisure time activities		+	+				
Studying in a faculty of choice		+	+	+	+	+	
Nicotine dependence		+					
Health problem		+	+				

[1]presence of experiences that had depressed psychosocial well-being in the last year

[2]student's opinion of his/her academic achievement

[3]presence of experiences that had promoted psychosocial well-being in the last year

Table 2. Model 1: Main independent variables affecting the students' GHQ-12 scores

	N	High GHQ-12 score (%)	B	S.E.	P-value*	Odds Ratio (95% C.I.)
Constant			-0.507	0.066	<0.001	0.60
Negative event[1]						
Absent	1797	47.1				1.00
Present	1515	68.5	0.871	0.074	<0.001	2.39 (2.07-2.76)
Academic achievement[2]						
High	1337	47.1				1.00
Medium	1583	58.8	0.503	0.079	<0.001	1.65 (1.42-1.93)
Low	577	73.6	1.122	0.115	<0.001	3.07 (2.45-3.85)

[1]presence of experiences that had depressed psychosocial well-being in the last year

[2]student's opinion of his/her academic achievement

* Wald test P value

-2 Log-Likelihood=4250.849, Omnibus Test chi-square=265.204 (P < 0.001)

those variables included in Model 2 in addition to those in Model 1, none was found to have a confounding role with respect to the correlation of GHQ-12 and the presence of a negative event and/or academic achievement.

According to Model 2, the presence of a negative event was found to increase the risk of having a mental problem by 2.11 fold. On the other hand, the risk was found to be 1.62 times more for students who classified their achievement as "medium" and 3.01 times more for those who classified their achievement as "low".

Female students (OR=1.51); students who considered their income as partially sufficient (OR=1.47) or

Table 3. Model 2: Independent variables affecting the students' GHQ-12 scores

	N	High GHQ-12 score (%)	B	S.E.	P-value*	Odds Ratio (95% C.I.)
Constant			-0.885	0.328	0.007	0.41
Negative event[1]						
Absent	1797	47.1				1.00
Present	1515	68.5	0.748	0.088	0.000	2.11 (1.78-2.51)
Academic achievement[2]						
High	1337	47.1				1.00
Medium	1583	58.8	0.484	0.089	<0.001	1.62 (1.36-1.93)
Low	577	73.6	1.103	0.132	<0.001	3.01 (2.32-3.90)
Sex						
Male	1291	52.8				1.00
Female	2210	59.1	0.411	0.090	0.000	1.51 (1.27-1.80)
Studying in a faculty of choice						
Yes	3020	54.9				1.00
No	471	68.4	0.252	0.128	0.048	1.29 (1.00-1.65)
Opinion of students on their income						
Sufficient	1734	48.5				1.00
Partially sufficient	1512	63.4	0.384	0.087	0.000	1.47 (1.24-1.74)
Insufficient	258	70.5	0.384	0.185	0.038	1.47 (1.02-2.11)
Perception of body image						
Positive (healthy)	2700	52.5				1.00
Negative	782	70.5	0.529	0.104	0.000	1.70 (1.38-2.08)
Positive event[3]						
Present	1687	54.7				1.00
Absent	1702	58.5	0.273	0.087	0.002	1.32 (1.11-1.56)
Emotional violence						
Absent	2514	52.9				1.00
Present	994	66.6	0.501	0.102	0.000	1.65 (1.35-2.01)
Relation with father						
Good	2502	52.5				1.00
Bad	784	70.2	0.454	0.103	0.000	1.57 (1.29-1.93)
Relation with mother						
Good	3159	54.9				1.00
Bad	263	77.1	0.531	0.175	0.002	1.70 (1.21-2.40)
Relation with partner						
Good	1108	50.9				1.00
Average	200	69.0	0.626	0.198	0.002	1.87 (1.27-2.76)
Bad	89	76.1	0.828	0.301	0.006	2.29 (1.27-4.13)
No partner	2070	57.7	0.488	0.095	0.000	1.63 (1.35-1.96)
Nicotine dependence						
Non-dependent	2787	55.2				1.00
Low dependency	592	62.4	0.092	0.116	0.431	1.10 (0.87-1.38)
Medium and high dependency	102	70.6	0.674	0.284	0.018	1.96 (1.13-3.43)
Leisure-time activities			-0.048	0.019	0.011	0.95 (0.92-0.99)

[1]presence of experiences that had depressed psychosocial well-being in the last year

[2]student's opinion of his/her academic achievement

[3]presence of experiences that had promoted psychosocial well-being in the last year

* Wald test p value; **included in the analysis as a continuous variable.

-2 Log-Likelihood value=3435.838 and Omnibus Test chi-square value=1452.449 (SD=18; P<0.001)

insufficient (OR=1.47); students with a negative body image (OR=1.70); students without any positive event (OR=1.32); students exposed to emotional violence (OR= 1.65); students with relationship problems with their fathers (OR= 1.70) or mothers (OR=1.57); students who study in a department/faculty other than their preference (OR=1.29); students who classify their relations with their partners as average (OR=1.87) or bad (OR=2.29) and those without an intimate partner (OR=1.63); and students with low (OR=1.10) and high nicotine dependence (OR=1.96) were found to be at higher risk for mental problems. The risk was found to decrease as the student's leisure time activities increased (OR=0.95) (Table 3).

According to the -2 log-likelihood ratio test value, the predictive power of Model 2 was found to be significantly higher than that of Model 1 (P<0.001).

Discussion

This study examined the relationship between psychiatric distress as measured by the GHQ-12 and some sociodemographic characteristics of Hacettepe University students. GHQ, which was used to assess the mental health status of the students, was found to be both valid and reliable for use in adults in many different countries and is a screening test used by the World Health Organization (WHO) in one of its multicentered studies (8).

The Mental Health Policy of Turkey involves identifying the high-risk groups among children and adolescents (9). Currently, the number of extensive studies among university students at the national level is inadequate; however, a recent nationwide study on the burden of diseases (10) pointed out the importance of the mental health of the young population. According to the results of this study, neuropsychiatric disorders were found to be the most common cause of the disease burden among the young population aged 15-29 years (27.1%) and the second most common cause among the general population (13.3%). Scores above the GHQ-12 cut-off point were determined in 56.8% of the students. Harrison (11) had found an increased risk of morbidity among the young age range. In a previous study conducted to assess the psychological health of undergraduates during their initial entry to the university using the GHQ, 57% of the medical students and 47.3%

of the law students were found to have scores above the traditional cut-off points (12)

When students were asked about the most distressing event in the last year, nearly half of them reported educational problems such as failing the class or failure to study in a faculty of their preference (15.6%), loss of a family member (15.3%) or breaking up with their partner because of an infidelity or a quarrel (13.5%). Similarly, most of the students reported educational achievements such as passing the class or success in the university entrance exams (34.5%), a happy event in the family such as birth or marriage (15.4%), or positive progress in their intimate relationship (20.0%) as the happiest event in the last year. The main components of the students' lives are their education, their families and their intimate partners. In this study, presence of a negative event was found to have a more negative effect on mental health in respect to GHQ-12 (OR=1.62), and the students who did not have a positive event were found to be at higher risk (OR=1.32) than those who did. According to Lo (13), the GHQ measures two types of stress - chronic and transient. Presence of the "negative event" variable in all models of cut-off points might suggest that events that result in emotional trauma have long-term effects on the mental health of students. On the other hand, experience of a positive event has a favorable effect on mental health.

In our study, students with an average (OR=1.62) or low (OR=3.01) academic achievement were found to be at higher risk versus those with a high level of achievement. Presence of academic achievement in all models of cut-off points might suggest that high academic achievement has a positive effect on the mental health of students, as measured by GHQ-12. The results of our study are in accordance with similar previous studies in the literature. Academic pressure is one of the main sources of stress among medical students (14). Students who were academically less successful in medical school reported somewhat higher levels of depressive symptoms (15). The major source of stress for the cohort of undergraduate nursing students was academic studies (16). In another recent study, the magnitude of school work among university students in Nigeria was found to be one of the most important factors affecting the GHQ-12 scores (17).

In Turkey, high school students enter a national university examination, and are placed in the faculties and

colleges according to their exam scores. Having a higher education degree is almost a necessity for job placement in Turkey; therefore, students often end up in a situation where they continue their higher education in a faculty other than their preference, with the fear of not being able to find a job in the future. As expected, enrollment in a non-preferred faculty has negative effects on mental health. In our study, students who were enrolled in a faculty other than their preference were found to be at higher risk (OR=1.29) than those enrolled in their faculties of choice. In a previous study conducted among dentistry students in Japan, students whose first faculty of choice was not dentistry were found to experience more stress than their counterparts and the difference was statistically significant (18). These results point out the importance of delivering occupational counseling services for the students before they enter university. Young people usually become unhappy and unsuccessful if they have to continue their education in a faculty they did not initially select or desire.

Sociodemographic factors are among the strong predictors of depression and anxiety (11). In our study, the lower percentage of male students (36.9%) might be indicative of a gender imbalance among students or might suggest that female students have better attendance. In our study, female students (OR=1.51) were found to be at higher risk for mental problems. While our findings of higher GHQ scores among female students are in accordance with the results of some previously published studies on gender and psychiatric morbidity (11), conflicting results are also present in the literature. Results of the Study on the Mental Health Profile of Turkey showed no gender difference among adolescents with respect to mental health problems according to the scores of the self-administered scales (19). In another study conducted at the University of Glasgow Medical School, no difference was found in GHQ-12 case status between male and female students (20). In other related studies, there were also no significant differences between the percentages of male and female students who scored as cases on the GHQ-12 (21,22). In a cross-sectional study among pre-clinical and clinical medical students, GHQ-12 scores were found to be higher for female students, although the difference was not statistically significant (23,24).

Our study did not determine any significant difference in GHQ-12 scores between the students according to their educational status as first- or third-year students. Other previous studies with GHQ-12 reported varying results. In one study, there was no significant difference between the first- and fourth-year students with respect to the percentages of cases as determined using the GHQ-12 (21). In another longitudinal cohort questionnaire survey conducted among first-year students, the prevalence of psychological morbidity and the mean GHQ-12 scores increased significantly between the first and third terms, with no significant gender differences (20). Aktekin et al. (25) reported that psychological scores on the GHQ increased significantly among Turkish medical students between the first and the second years. Yet, in another cross-sectional study among clinical medical students, no correlation could be determined between age and GHQ scores (23).

In our study, student's opinions regarding their income were found to be effective on GHQ-12 scores. Students who perceived their income as insufficient or partially sufficient were found to be at higher risk than those reporting a sufficient income. Income creates difference in access to scarce material goods. According to Vitaliano (14), financial problems are one of the main sources of stress among medical students. Ross et al. (22) found no direct correlation between debt, class ranking and GHQ score in their study, but suggested financial worries as one of the causes of mental health difficulties. In another cross-sectional study among clinical medical students, no correlation was determined between GHQ and the students' assessment of the adequacy of their pocket money (23). According to the results of some studies, financial difficulty is one of the major sources of stress for students (16,17).

In our study, students who had negative body images (OR=1.70) were found to be at higher risk than those comfortable with their appearance. As is widely known, body image is highly important in adolescence. Research shows that young people who are not comfortable with their appearance are at higher risk for developing mental health problems. While delivering services to adolescents, appropriate assessment of the adolescent's perception of his/her body image and mental health is essential for early diagnosis of related disorders.

Our study also showed that students exposed to emotional trauma (OR=1.65) were at higher risk for mental problems. Emotional abuse can have serious physical and psychological consequences for individuals,

including severe depression and anxiety. Emotional abuse can severely damage a person's sense of self-worth and perception. Both men and women use emotional abuse as a way to control their partners. In a Canadian study on abuse in university and college dating relationships, 81% of male respondents reported that they had psychologically abused a female partner (26). Adolescents who are victims of physical, emotional or sexual abuse are more vulnerable to stressful conditions than their peers (27). Adolescents with family problems are also more vulnerable to stressful conditions than their peers (27). According to the current study, the relationship of students with their parents or intimate partners affected their GHQ-12 scores. Previous studies have found that when faced with a problem, common avenues of support are friends and family (12). In a sample of English undergraduate students (16-23 years of age), the researchers found that decreased closeness was related to poorer psychological health (28).

Harrison et al. (11) examined the association between potential predictors and psychiatric morbidity with a logistic regression analysis and found the strongest predictor of high GHQ score in analyses as the presence or absence of a person to talk to about problems. Results from Lo's (13) study among undergraduate nursing students indicated that most students have their family, spouse or partner as their main support system. Positive relations with family members or an intimate partner have favorable effects on an adolescent's mental health. Mental health examination and monitoring of adolescents who experience family problems are essential.

Weak relations with family members and the desire to escape from daily problems are reported as the main reasons for tobacco use among young people (29). Our study determined that students with a high level of nicotine dependence were at higher risk for mental problems. On the other hand, no difference was found in relation to low dependence. In a previously conducted cross-sectional study among pre-clinical medical students, GHQ-12 scores were found to be higher for smokers, although the difference was not statistically significant (24). In another cross-sectional study among clinical medical students, no correlation was determined between GHQ scores and smoking (23). According to the results of a prospective cohort study where evidence of common mental disorders was measured by using the self-administered GHQ-12, the researchers found that people who had significant mental health problems were more likely to smoke and that this behavior was most likely to occur in the youngest age groups (30).

In Turkish, "leisure time activities" and "recreation" are similar in meaning and can be used interchangeably. Recreation is defined as voluntary activities during which an individual is usually renewed and relaxed. It creates a supportive environment for the individual's physical and mental health, helps him/her to socialize and develop his/her skills and increases his/her school or work performance. We found an inverse relationship between leisure time activities and GHQ-12 scores, with more leisure time activity resulting in lower scores (OR=0.95). Lack of recreation is one of the most common stressors as mentioned by the students (17). Depression and anxiety have been associated with lack of time for other activities and loss of social time according to several studies examining the relationship between sources of stress and psychological morbidity in medical students (14,15). All these findings suggest the importance of increasing the availability of different recreational activities for young people.

Conclusion and Recommendations

Mental health problems among young people have been gradually increasing in recent years. The findings of our study can not be generalized for all university students, since our study sample only included first- and third-year students; however, the study variables can guide other researchers in their future studies on the mental health status of students.

In this study, "academic achievement" and "presence of a negative event in the last year", which were taken as the main factors affecting the mental health of university students, were present in all models of GHQ-12 analysis. This finding indicates the strong impact of these two factors on the mental health of students. "Studying in a faculty of preference" and "presence of a positive event" variables were found to act in accordance with the main variables and were found to be as effective as other variables on mental health. Among all the factors affecting mental health, relationship with family members and an intimate partner, economic status, perception of body image and exposure to emotional trauma indicate the importance of the active role of the student's family as well as peers in prevention and health- promotion interventions.

All of the above-mentioned variables can be identified and monitored by University Health Centers. These risk factors can be diagnosed easily during a student's routine visit to the health center for any reason. The factors assessed in the study as affecting mental health can be used in a preventive psychiatric approach and for early diagnosis of mental problems in health centers. Those students identified as having a risk factor during a visit to the health center with any complaint should also receive mental health support. In order to discover solutions for these students' mental health problems, counseling services should be readily available and attainable in these health centers.

Increasing the availability of different recreational activities for students in university campuses is very important for the students' social development. Therefore, students should be given the option and their participation in such social programs facilitated as early as possible.

Academicians can also become an integral part of the risk assessment of students through an established counseling system. After social or life risks of the students have been identified, academicians can take an active role in interventions aimed at developing healthy behaviors among students and in referral of those students at risk to the appropriate health centers.

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