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Research Article

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FACTORS ASSOCIATED WITH DEPRESSION, ANXIETY AND STRESS LEVELS AMONG MEDICAL STUDENTS

TIP FAKÜLTESİ ÖĞRENCİLERİNDE DEPRESYON, ANKSİYETE VE STRES DÜZEYİ İLE İLİŞKİLİ FAKTÖRLER

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Öz

Amaç: Tıp fakültesinde okuyan öğrencilerin yoğun tıp eğitimi ve diğer kişisel faktörler nedeniyle depresif, kaygılı ve stresli olduğu gözlenmektedir. Bu çalışmada Kırşehir Ahi Evran Üniversitesi Tıp Fakültesi öğrencilerinin 1.Kurul Sınavı öncesi ve sonrasında depresyon, anksiyete ve stres prevalansları ve bu düzeylere etki eden faktörlerin belirlenmesi amaçlanmıştır.

Materyal ve Metot: Ekim 2018 - Kasım 2018 tarihleri arasında 1.Kurul Sınavı öncesi ve sonrasında gerçekleştirilen bu çalışmada 42 soruluk Depresyon, Anksiyete ve Stres ölçeği ve akademi, sağlık ve sosyoekonomik bilgileri içeren soruların bulunduğu Genel Bilgi Formu kullanılmıştır.

Bulgular: Totalde, sınav öncesi depresyon, anksiyete ve stres prevalansları sırasıyla %34,04, %48,94, %32,62; sınav sorası ise %43,71, %49,67 ve %37,09'dur. İstatistiksel olarak anlamlı olmasa da sınav öncesinde ve sonrasında en yüksek depresyon (p=0,228 ve p=0,512), anksiyete (p=0,428 ve p=0,083) ve stres puanları (p=0,125 ve p=0,853) Dönem 2 öğrencilerine aittir. Genel olarak, puanlara göre erkek öğrenciler, kız öğrencilere göre daha depresif (p=0,044 ve p=0,018), kaygılı (p=0,392 ve p=0,209) ve stresli (p=0,736 ve p=0,977) bulunmuştur. Hem sınav öncesi hem de sınav sonrası depresyon, anksiyete ve stres düzeyleri sağlıkla ilgili risk faktörleri ile ilişkili bulunmuş, sosyoekonomik risk faktörlerinin ise çoğunlukla stres düzeyleri ile ilişkili olduğu saptanmıştır.

Sonuç: Sınav öncesi ve sınav sonrası kaygı prevalansı yüksek bulunmuştur. Sınav sonrası depresyon, anksiyete ve stres prevalanslarının arttığı belirlenmiş, bu nedenle tıp eğitimi alan öğrenciler için akademik ve sosyal destek sistemlerinin oluşturulması önerilmiştir.

Anahtar Kelimeler: Anksiyete, depresyon, tıp eğitimi, prevalans, etken, stres.

Abstract

Objectives: Medical students are observed to feel depressive, anxious and stressful due to intensive medical education program along with other individual factors. This study aims at investigating the prevalence of depression, anxiety and stress levels and their potential determinant among medical students on before and after the exam in newly-established Medical Faculty of Kirsehir Ahi Evran University in Turkey.

Materials and Methods: This study was carried out on before and after the first Committee Exam by conducting 42-item Depression, Anxiety and Stress Scale with General Information Form that includes questions regarding health, academia and socioeconomic-related factors between October and November 2018.

Results: In total, prevalence of depression, anxiety and stress were found as 34.04%, 48.94%, 32.62% and 43.71%, 49.67% and 37.09% on pre and post-exam, respectively. Even though statistically insignificant, Phase-II students had the highest depression (p=0.228 and p=0.512), anxiety (p=0.428 and p=0.083) and stress scores (p=0.125 and p=0.853) on both pre and post exam. Male students were more likely to feel depressed (p=0.044 and p=0.018), anxious (p=0.392 and p=0.209) and stressed (p=0.736 and p=0.977) compared to females in overall in terms of their scores. Depression, anxiety and stress levels were mostly associated with health-related factors either pre or post-exam. Socioeconomic determinant was found to be mostly associated with stress levels.

Conclusion: High prevalence of anxiety was observed on both before and after the exam. Depression, anxiety and stress prevalence were found to be increasing on post-exam, therefore academic and social support systems are suggested to be provided for medical students.

Keywords: Anxiety, depression, medical education, prevalence, determinant, stress.

Introduction

Medical education is known to be quite abrasive and demanding because of excessive information in limited time, the necessity of excessive research, not having so much spare time to relax, the frequency of examinations which require knowledge of basic sciences and clinical skills and the necessity of having the complete-knowledge of these skills in order to intervene the patient's life in case of emergency. Such stressful and intensive 6-years-long medical education programme and these aforementioned factors along with individual problems (family – friends and financial issues) could cause psychological disorders among medical students such as stress, anxiety and even depression.

Depression is a mental illness which has various symptoms including feeling of guilt, pessimism, low motivation, lack of attention, low self-worth, suicidality, sleep disturbance and inappetence. Anxiety is characterized by worried thoughts, tension, increased blood pressure, respiratory rate, pulse rate, sweating, difficulty of swallowing, dizziness, and chest pain, while stress can be defined as any uncomfortable emotional experience accompanied by predictable biochemical, physiological and behavioral changes.[1-2] All these psychological disorders can be observed in people regardless of their ages, races, genders therefore they are quite prevalent worldwide. For medical students however, their prevalences are known to be higher than the overall prevalences. The global prevalence of depression among medical students has been found as 28%; on the other hand, high prevalence of anxiety and stress among medical students have been reported over the years in many studies.[3-11]

The aim of this study is to determine the prevalence and associated factors of depression, anxiety and stress status before and after the first Committee-Exam among medical students in Kirsehir Ahi Evran University Faculty of Medicine. It is the first study that analyzes the psychological distress levels among medical students in newly-established medical faculty in Central Anatolia, Turkey.

Materials and Methods

This study was carried out between October – November 2018 with Phase I, Phase II and Phase III medical students of Kirsehir Ahi Evran University Faculty of Medicine. This faculty was established in 2011 and took its first students in 2015, therefore only Phase I, Phase II and Phase III medical students are being educated in this faculty. Inclusion criteria was defined as being 18 years old or older and being educated in medical faculty of the university; while students whose age was below 18 and who are being educated in other faculties of the university were excluded from the study.

Ethical considerations

This study was approved by Kirsehir Ahi Evran University non-interventional Clinical Studies Ethical Committee. (Approval Date : 09/10/2018 - Approval Number : 2018-18/154).

Data collection

Data was collected via validated Turkish version of 42-item Depression, Anxiety and Stress Scale (DASS-42) and General Information Form which was created by the researcher by reviewing the existing literature.[12-13] The form includes academia-related (Scholarship, faculty of medicine preference, satisfied with the education of faculty of medicine, entrance of the faculty of medicine, interested in undergraduate transfer), health-related (Smoking status, sleep duration, chronic disease, psychiatric diagnosis of parents or relatives, regular drug use, psychological support, phobia, satisfied with the physical appearance) socio-demographic-related (Sex, nationality, phase, housing, economic status of the family, satisfied with the city, family's attitude, relationship status, hobby, having problems with friends) questions. Questionnaires and General Form were applied approximately 1-week before and 1-week-after the first Committee-Exam. Students were informed about this study via printed Consent Form, which was given with DAS-42 Scale and General Information Form. This study was conducted with the volunteer participants who gave the consent. The original DASS-42 scores can be categorized from normal to very severe for depression, anxiety and stress. For depression, scores less than 9 are defined as 'normal', 10–13 are 'mild', 14–20 are 'moderate', 21–27 are 'severe' and scores greater than 28 are described 'extremely severe'. For anxiety, scores less than 7 are considered as 'normal', 8–9 are 'mild', 10–14 are 'moderate', 15–19 are 'severe' and scores above 20 are 'extremely severe'. Stress scores below 14 are in 'normal' category, 15-18 are 'mild', 19–25 are in 'moderate' category, 26–33 are 'severe' stress and scores greater than 34 are defined as 'extremely severe'. However, two categories were created to determine these levels by merging normal-mild categories and moderate-severe and very severe categories in this study. Therefore the cut-off points are defined as less than 13 are 'normal' and scores greater than 14 are 'depressed'; scores less than 9 are normal; while scores greater than 10 are 'anxious' and scores less than 18 and greater than 19 are described as normal and stressed, respectively.

Statistical analysis

Mean ± standard deviation and median, minimum, maximum values were given for quantitative variables, while frequencies and percentages were reported for categorical ones. Kolmogorov-Smirnov Test was used to determine the normality of the quantitative data. t-test, Mann-Whitney U Test and One-Way ANOVA were applied depending of the normality of the quantitative data for group comparisons. Multiple logistic regression was used to identify factors affecting the depression, anxiety and stress levels of the students. Univariate analysis such as t-test, Mann-Whitney U Test and Chi-Square Test were performed before multiple logistic

regression analysis to identify candidate variables for final model. Variables with a p-value < 0.20 in the univariate analysis were included to the multiple logistic regression model. Backward Wald was used as a variable selection method. Adjusted Odds Ratios (AOR) along with their 95% confidence intervals (CIs) were reported for these regression models. SPSS (Statistical Programme for Social Sciences) version 22.0 (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.) was used for all analysis. Significance level was taken as 0.05.

Results

The response rate was 63.51% (141 out of 222) and 68.01% (151 out of 222) before and after the exam, respectively. Mean age was 19.41 ± 1.23 on pre-exam while it was 19.50 ± 1.17 on post-exam. Baseline characteristics of the participants on pre and post exam were given in Table 1.

Either before or after the exam, mean of depression, anxiety and stress scores were higher in Phase II students compared to Phase I and Phase III students (Table 2). Moreover, male students were observed to have higher depression and anxiety scores both before and after the exam compared to females (Table 3).

Results revealed that students mostly feel anxious before and after the exam (48.94% and 49.67%, respectively). Depression was the second most common mood among students (34.04% and 43.67%, respectively) while stress is the least common one (32.62% and 37.09%, respectively) on pre- and post-exam. Besides, it's worth to mention that prevalence of depression and stress increased after the exam, the most remarkable increase was observed in prevalence of depression, with increment of about 10% (34.04% to 43.67%); prevalence of stress also increased (32.62% to 37.09%) while prevalence of anxiety remains the same before and after the exam. Psychological distress prevalences were calculated in terms of gender groups. Results revealed that although statistically insignificant, female students were seem to be more anxious and stressed compared to males on both pre (χ^2= 1.774; p=0.412) and post-exam (χ^2= 1.146; p=0.564); while male students were found to be more depressed than females on either pre- or post-exam. Depression, anxiety and stress prevalences were calculated as 25.77%, 43.30% and 30.93%, respectively for females; while they were found as 34.85%, 40.91% and 24.24%, respectively for males on pre-exam. On post-exam however, psychological distress prevalences for females were calculated as 30.70%, 38.60% and 30.70% for depression, anxiety and stress, respectively; they were 37.35% for depression, 37.35% for anxiety and 25.30% for stress for male students. On both before and after the exam, depression, anxiety and stress prevalences were found similar in terms of gender groups (χ^2= 1.774; p=0.412 for pre-exam and χ^2= 1.146; p=0.564 on after the exam) Furthermore, psychological distress prevalences were also reported in terms of Phase for both pre- and post-exam. Results suggested that depression, anxiety and stress prevalences were significantly different across

severity of psychological distress groups on pre-exam only for Phase-I students (p=0.007), results were summarized in Table 4 (Table 4).

Cronbach Alpha internal consistency coefficients were calculated for this study in order to determine the consistency of responses. They were found as 0.94, 0.87, 0.89 on pre-exam; while they were 0.95, 0.91 and 0.91 on post-exam for depression, anxiety and stress sub-dimensions, respectively. Overall Cronbach Alpha coefficient was 0.96 and 0.97 on pre and post-exam, respectively.

Binary logistic regression results revealed that psychiatric diagnosis of first degree family member was the common determinant for all depression (AOR = 8.327, 95% CI =2.376 – 29.184; p=0.001), anxiety (AOR = 7.783, 95% CI = 2.227 – 27.199; p=0.001), and stress (AOR = 3.063, 95% CI = 0.998 – 9.398; p=0.05) status of medical students on pre-exam; while it was satisfied with physical appearance determinant on post-exam for each psychological distress levels. Beside psychiatric diagnosis; sleep duration, smoking status, family's economic status and phobia were found to be significantly associated with depression; they were psychological support, satisfied with physical appearance for stress and sleep duration for anxiety on pre-exam. For the post-exam setting, smoking status and faculty of medicine preference for depression; regular drug use, faculty of medicine preference for anxiety; housing and psychological support for stress were significant factors besides satisfied with physical appearance (Table 5).

Table 1. Baseline Characteristics

Variables	Pre - exam		Post - exam		p
	n	%	n	%	
Sex					
Female	87	61.70	96	63.57	0.417
Male	54	38.30	55	36.43	
Nationality					
Turkish	130	92.20	141	93.38	0.822
Other	11	7.80	10	6.62	
Relationship Status					
Single	138	97.87	149	98.68	0.675
Other	3	2.13	2	1.32	
Phase					
Phase I	81	57.44	74	49.01	0.344
Phase II	30	21.28	40	26.49	
Phase III	30	21.28	37	24.50	
Smoking Status					
Yes	8	6.11	17	11.33	0.241
No	115	87.78	127	84.67	
Former Smoker	8	6.11	6	4	
Regular Drug Usage					
Yes	17	12.06	22	14.57	0.607
No	124	87.94	129	85.43	
Housing					
Family Home	9	6.38	11	7.28	0.523
Dormitory	91	64.54	97	64.24	
Student Home	39	27.66	43	28.48	
Relatives' Home	2	1.42	-	-	
Economic Status of Family					
Bad	2	1.42	3	2	0.892
Moderate	78	55.32	80	53.33	
Good	61	43.26	67	44.37	
Scholarship					
Yes	23	16.31	22	14.57	0.698
No	118	83.69	128	85.43	
Psychological Support					
No	116	82.27	124	82.12	0.630
Former Support	24	17.02	24	15.89	
Yes	1	0.71	3	1.99	
Phobia					
Yes	76	53.90	76	50.33	0.542
No	65	46.10	75	49.67	
Faculty of Medicine Preference					
My preference	118	83.69	117	77.48	0.409
Family's Preference	13	9.22	19	12.58	
Other	10	7.09	15	9.94	
Psychiatric diagnosis (Parents/Relatives)					
Yes	22	15.60	29	19.21	0.444
No	119	84.40	122	80.79	
Chronic Disease					

Yes	12	8.51	14	9.27	
No	129	91.49	137	90.73	0.840
Hobby					
Yes	107	75.89	100	66.67	0.093
No	34	24.11	50	33.33	
Satisfied with the education of faculty of medicine					
Yes	34	24.11	25	16.56	0.275
Partly	83	58.87	98	64.90	
No	24	17.02	28	18.54	
Satisfied with the city					
Yes	44	31.21	36	23.84	0.189
No	97	68.79	115	76.16	
Entrance of the faculty of medicine					
First attempt	83	58.87	89	58.94	
Second attempt	47	33.33	57	37.75	0.214
More than two attempts	11	7.80	5	3.31	
Having Problems with Friends					
Yes	12	8.51	14	9.27	0.840
No	129	91.49	137	90.73	
Satisfied with the physical appearance					
Yes	83	58.87	78	51.66	0.461
Partly	48	34.04	61	40.40	
No	10	7.09	12	7.94	
Family's Attitude					
Authoritarian	5	3.55	9	5.96	0.178
Indulgent	76	53.90	69	45.70	
Either authoritarian or indulgent	60	42.55	70	46.36	
Uninterested	-	-	3	1.98	
Interested in undergraduate transfer					
Yes	86	60.99	97	64.67	0.545
No	55	39.01	53	35.33	

Table 2. Depression, Anxiety and Stress Levels in Terms of Phase

PRE-EXAM	**Depression Score**	**Mean ± SD**	**Median [Min - Max]**	**p-value**
	Phase I		9 [0 - 41]	0.228**
	Phase II		11.50 [1 - 39]	
	Phase III		10 [0 - 37]	
	Anxiety Score			
	Phase I	10.36 ± 6.73		0.428*
	Phase II	12.23 ± 7.82		
	Phase III	10.17 ± 7.76		
	Stress Score			
	Phase I	14.89 ± 7.48		0.125*
	Phase II	18.23 ± 9.57		
	Phase III	16.87 ± 7.82		
POST-EXAM	**Depression Score**	**Mean ± SD**	**Median [Min - Max]**	**p-value**
	Phase I	12.26 ± 9.73		0.512*
	Phase II	14.15 ± 87		
	Phase III	11.89 ± 9.89		
	Anxiety Score			
	Phase I	11.32 ± 7.91		0.083*
	Phase II	13.28 ± 7.77		
	Phase III	9.27 ± 7.59		
	Stress Score			
	Phase I	16.15 ± 8.31		0.853*
	Phase II	16.83 ± 8.72		
	Phase III	15.73 ± 9.33		

*: One Way ANOVA

**: Kruskal-Wallis Test

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Table 3. Anxiety and Stress Levels in Terms of Gender

PRE-EXAM	**Depression Score**	**Mean ± SD**	**Median [Min - Max]**	**p-value**
	Female		9 [0 - 41]	0.044**
	Male		11.50 [0 - 37]	
	Anxiety Score			
	Female		9 [0 - 35]	0.392**
	Male		9.50 [0 - 28]	
	Stress Score			
	Female	15.84 ± 8.59		0.736*
	Male	16.31 ± 7.31		
POST-EXAM	**Depression Score**	**Mean ± SD**	**Median [Min - Max]**	**p-value**
	Female		9.5 [0 - 42]	0.018**
	Male		14 [1 - 40]	
	Anxiety Score			
	Female		9 [0 - 42]	0.209**
	Male		11 [0 - 33]	
	Stress Score			
	Female	16.24 ± 9.47		0.977*
	Male	16.20 ± 6.99		

*: Independent Samples t -Test
**: Mann-Whitney U Test

Table 4. Prevalence of Depression, Anxiety and Stress in Terms of Phase

Timing	**Phase**	**Severity**	**Depression**	**Anxiety**	**Stress**	**$\chi 2$**	**p**
Pre - exam	Phase I	Normal or mild	59 (72.84)	41 (50.62)	56 (69.14)	9.991	0.007
		Moderate, severe and very severe	22 (27.16)	40 (49.38)	25 (30.86)		
	Phase II	Normal or mild	17 (56.67)	14 (46.67)	18 (60)	1.496	0.473
		Moderate, severe and very severe	13 (43.33)	16 (53.33)	12(40)		
	Phase III	Normal or mild	17 (56.67)	17 (56.67)	21 (70)	1.165	0.559
		Moderate, severe and very severe	13 (43.33)	13 (43.33)	9 (30)		
Post - exam	Phase I	Normal or mild	43 (58.11)	37 (50)	48 (64.86)	3.358	0.187
		Moderate, severe and very severe	31 (41.89)	37 (50)	26 (35.14)		
	Phase II	Normal or mild	20 (50)	17 (42.50)	25 (62.50)	3.270	0.195
		Moderate, severe and very severe	20 (50)	23 (57.50)	15 (37.50)		
	Phase III	Normal or mild	22 (59.46)	22 (59.46)	22 (59.46)	0.001	0.999
		Moderate, severe and very severe	15 (40.54)	15 (40.54)	15 (40.54)		

Table 5. Binary Logistic Regression Results

	Dependent Variable	**Adjusted Odds Ratio (AOR)**	**95% Confidence Interval for AOR**		
	Depression		Lower	Upper	p-value
	Sleep duration	2.316	1.506	3.560	<0.001
	Smoking Status				
	No	Ref.			0.003
	Yes	4.840	1.421	16.489	0.012
	Former Smoker	12.321	1.896	80.054	0.009
	Family's Economic Status				
	Bad	Ref.			0.042
	Moderate	0.053	0.002	1.801	0.103
	Good	0.024	0.001	0.848	0.040
	Phobia	2.516	1.058	5.979	0.037
	Psychiatric diagnosis (Parents/Relatives)	8.327	2.376	29.184	0.001
	Dependent Variable				
	Anxiety				
	Satisfied with the physical appearance				
	Yes	Ref.	-	-	0.061
	Partly	1.298	0.592	2.847	0.515
PRE - EXAM	No	12.856	1.511	109.390	0.019
	Sleep duration	1.675	1.175	2.388	0.004
	Psychiatric diagnosis (Parents/Relatives)	7.783	2.227	27.199	0.001
	Dependent Variable				
	Stress				
	Psychological Support*	4.041	1.434	11.382	0.008
	Faculty of Medicine Preference				
	My preference	Ref.	-	-	0.053
	Family's Preference	3.347	0.914	12.249	0.068
	Other	3.767	0.907	15.65	0.068
	Phobia	2.278	0.959	5.411	0.062
	Satisfied with the physical appearance				
	Yes	Ref.	-	-	0.033
	Partly	1.394	0.579	3.354	0.459
	No	7.800	1.667	36.49	0.009
	Psychiatric diagnosis (Parents/Relatives)	3.063	0.998	9.398	0.050
	Dependent Variable				
	Depression				
	Smoking Status				
	No	Ref.	-	-	0.023
	Yes	4.863	1.081	21.869	0.039
	Former Smoker	7.560	0.982	58.206	0.052
	Faculty of Medicine Preference				
	My preference	Ref.	-	-	0.013
	Family's Preference	5.888	1.538	22.533	0.010
	Other	3.897	0.853	17.797	0.079
	Chronic Disease	4.105	0.842	20.014	0.081

POST - EXAM	Hobby	0.467	0.192	1.135	0.093
	Having Problems with Friends	5.082	0.936	27.59	0.060
	Satisfied with the physical appearance				
	Yes	Ref.	-	-	<0.001
	Partly	4.790	1.991	11.522	<0.001
	No	11.484	1.809	72.912	0.010
	Dependent Variable				
	Anxiety				
	Regular Drug Usage	0.161	0.040	0.640	0.010
	Faculty of Medicine Preference				
	My preference	Ref.	-	-	0.013
	Family's Preference	2.733	0.837	8.924	0.096
	Other	7.140	1.639	31.113	0.009
	Psychiatric diagnosis (Parents/Relatives)	2.599	0.911	7.414	0.074
	Satisfied with the physical appearance				
	Yes	Ref.	-	-	<0.001
	Partly	5.886	2.608	13.283	0.114
	No	3.507	0.739	16.65	0.641
	Dependent Variable				
	Stress				
	Satisfied with the physical appearance				
	Yes	Ref.	-	-	0.012
	Partly	2.388	1.073	5.317	0.033
	No	7.242	1.573	33.335	0.011
	Housing				
	Family Home	Ref.	-	-	0.014
	Dormitory	1.639	0.353	7.607	0.528
	Student Home	0.371	0.067	2.069	0.258
	Psychological Support	4.022	1.442	11.218	0.008
	Smoking Status				
	No	Ref.	-	-	0.088
	Yes	3.692	1.112	12.257	0.033
	Former Smoker	0.661	0.073	5.982	0.712

*: Psychological Support variable was taken as two-level (yes-no)

Discussion

High prevalence of anxiety was found among medical students on pre (48.94%) and post-exam (49.67%) in overall. Similar results have been reported earlier.[7-10, 14-17] However prevalence of depression (34.04% - 43.71%) and stress (32.62% – 37.09%) were remarkably lower compared to anxiety prevalence on both pre and post-exam.

In our study, mean of anxiety scores were found to be higher than mean of both depression and stress scores in all Phases (Phase-I, Phase-II and Phase-III) on pre-exam. Phase-II students had higher psychological distress scores than Phase I and Phase III students. Similar[18,19] and different results[7,9] were reported in previous publications in this regard. Moreover, it was found that male students had higher depression and anxiety scores than female students in pre and post-exam. Several researches had been published based on the similar findings as this study.[8-10, 15, 19] For the stress scores however, pre-exam scores of male students were higher than females whereas on post-exam scores of female students were higher. Similarly, regardless of the time of the examination, mean of depression and anxiety scores were found to be higher and stress scores were lower in males than females in a previous study.[9] On the other hand, in contrast to our results, higher psychological distress levels among female students has been in many studies.[4, 5, 10, 18, 20-23, 24]

Moreover, unlike our results, housing was found as a determinant for anxiety[10]; on the other hand, living alone was not observed as a determinant for depression.[4] Similarly, smoking status was reported as a determinant for depression[9], financial support was found to be a determinant for stress, depression and anxiety[8] and this factor was thought to be similar as economic status of the family factor in our study. Moreover, living with family was observed to be positively associated to depression and anxiety levels, while it was negatively associated with stress levels[8] Furthermore, in contrast to our results, having chronic disease was found to be associated with depression.[21]

Results of this study pointed out that especially Phase-II students are facing high levels of anxiety regardless of the time of the exam, this could be the result of intensive medical education syllabus of this Phase compared to syllabuses of Phase I and Phase III along with the frequency of exams which are being applied throughout the academic year. Another reason for this issue would be that Phase III education is known to be the introduction of clinical years after the completion of two-years-long syllabus containing basic medical sciences. Therefore, Phase III students are believed to be more involved to the medical education after either the two years of the education experience or the syllabus's more clinic-based contents. Phase I syllabus is not so intensive as the syllabus of Phase II and Phase III, hence students of this Phase are observed to be more relax and also they are thought to be in resting compared to Phase II and Phase III students because of the feeling of confidence of the entrance to the Faculty of Medicine.

In the current study, depression and stress prevalence did not seem to be in alarming level for the students especially on pre-exam. One reason for this result would be that this study was conducted before and after the first Committee-Exam of Phase-I, Phase-II and Phase-III; therefore contents of these exams were not so intensive. However, results demonstrated that all of the students, regardless of their Phase were observed to have high levels of anxiety both before and after the exam. This result is perturbative with regard to being already a high prevalence of anxiety since its levels are expected to increase throughout the academic year.

Hence, our suggestion would be to make arrangements in order to minimize the anxiety levels of students such as readjust the syllables so as to distribute especially the contents of the Phase – I and Phase – II equally, establishing academic and social support systems which enables the students to help lessen their anxiety levels.

The questionnaire and the DAS-42 Scale were applied before and after 1-week of the first Committee-Exam, therefore depression, anxiety and stress levels, their prevalence and factors associated to these psychological distress levels could be affected by other factors rather than the exam itself. For this reason it's suggested that inventories regarding these psychological distress levels should be applied to the students at the time of and right after the exam, to be able to have the clear insight of their prevalence, the real psychological distress levels and real factors affecting to them. Furthermore, depression, anxiety and stress levels were measured on only one pre and post-exam. Therefore, the other suggestion would be to apply these questionnaire and DAS-42 Scale on every pre and post- Committee-Exam to be able to evaluate the change in these psychological distress levels of medical students within the academic year more effectively.

This study has some limitations. Firstly, it was conducted on a newly-established medical faculty which has only Phase I, Phase II and Phase III students. Therefore, psychological distress levels of medical students on clinical years (Phase-IV, Phase-V, Phase-VI) of the faculty could not be analyzed. Secondly, it's a single-center study therefore these results cannot be generalized to the whole medical-student population of Turkey. Thirdly, part of this study is questionnaire-based therefore bias cannot be ignored. Moreover, it should be noted that approximately 40% of the students did not answer the questionnaire both on pre and post exam in total, this might be due to the timing of the application of this questionnaire, that is, questionnaires were asked to fill in during the courses, thus high absence rate of the courses was seemed to affect the response rate of the study. Furthermore, the design of this study is cross-sectional therefore casual relationships could not be determined. For this reason, the associations found in this study cannot be evaluated as in the form of casual nature. Further longitudinal studies should be performed in order to examine that kind of relationship.

To conclude up, a comprehensive study was conducted for evaluating the prevalence and associated factors of depression, anxiety and stress levels among medical students in Turkey. Further research that could cover the whole medical student population of Turkey is needed in order to determine the overall prevalence and related factors for these psychological distress levels.

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