# Nonclinical Depression and Anxiety as Predictor of Academic Stress in Medical Students

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## ABSTRACT

*To measure the role of anxiety and non-clinical depression as predictors of academic stress. In this study, supplementary objective had been gauging the prevalence of anxiety and depression among medical students of first year and final year, sought from six major medical colleges of Punjab. Almost all health professionals, no matter to which part of the world they belong to, face anxiety, depression and stress due to the nature of services they have to extend in medical profession such as time-pressures, workload, multiple roles and emotional issues. Quantitative research designed was employed; and cross sectional research design was used to lay out the research. The data was collected from first year and final year medical students. The duration of data collection was from Sep, 2014 to Sep, 2015. In Faculty of Medicine of five leading medical colleges, with total number of 650 students, the prevalence of anxiety and depression was found to be 83.9% and 67.9%, from first year to fourth year respectively, based on the cut-off points of both questionnaires. There was significant association among anxiety, depression and academic stress as computed through Pearson Product Moment Correlation. The regression analyses revealed that depression was significant predictor of academic stress but this was not the same for anxiety. Females were more anxiety and depression prone and reported greater academic stress than males. The study revealed significant distress among medical students, in terms of both anxiety and depression. It was inferred that the depression acts as pertinent predictor of academic stress. Furthermore, it was noticed that the prevalence of symptoms was higher among females. The findings carry significant implications for highlighting the addressing the need for psychological well-being of medical students in order to establish conducive environment of learning for medical professionals.*

**Keywords:** Anxiety; Depression; academic stress, medical Students
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## INTRODUCTION

Anxiety and depression are at ever increasing rate in today's world with its impeding psychosocial toll on the students. This is a worldwide phenomenon that academic stress, caused due to perceived anxiety and depression in a student's life deteriorates its academic output and academic performance. This distress ultimately also undermines the mental health and psychological well-being of the students. There have been scanty researches on Pakistani Medical students; the fewer ones so far been done indicate only the prevalence and evidence of anxiety and depression but none has taken an investigative approach to explore the ultimate effects that this condition may cause especially in the lives of medical students. A lot of researches from Western empirical research studies have reported that anxiety and depression among medical students is massive as there are radical changes and psychosocial and academic adjustment demands on them as first year students in some medical college have to face

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changed instructional methods and novel examination schedules. There are ample academic stressors such as information receptivity overload, hectic routine that is devoid of socialization, minimal leisure time, and recurrent academic evaluations. Some researches have shown that depression may lead to the state of fright, low motivation, despondency, anger and retaliation. With reference to a student's life, there are multidimensional physical and psychological morbidities attached with anxiety and depression. 1,2 The reported elevated levels of anxiety and depression 3–5 may have adverse effects on students' academic performance and may retard the proficiency of an academic program. This may deteriorate clinical practice in the long run and may lead to acquisition of stress-induced disorders. 6 There are many researches highlighting the adverse effects of anxiety and depression. 7,8 The eventual impact of this distressing state becomes discernable when doctors in their practice mishandle the patients' care (evident from such patterns as poor communication, diminished quality of care and medical blunders claiming the patient's well-being, care and sometimes even leading to fatal outcomes.9,10 There have been reported gender differences in anxiety and depression among medical students in all their academic years, in doctors with ongoing concurrent practice as well as in newly qualified physicians, which crucially reflects epidemiological patterns of anxiety and depression as being much more pronounced and common among women than men.17 Most of the studies so far conducted among medical students have revealed that academic stress shows up with a similar pattern as that of psychological distress.12–15 The relative decrease in anxiety and depression in some final graduation years expose lower levels of academic stress; the prevailing view is that anxiety and depression mounts during undergraduate education in medical students and this rise is found to be more distinct among women and in earlier phases of medical education.16–19 Thus the major purposes of this study are: (a) assessing the prevalence of anxiety and depression among first year and final year medical students in Faculty of Medicine with reference to all major Medical colleges of Punjab. (b) Comparing Gender Differences in anxiety, depression and perceived stress in medical students (c) Comparing academic Program level differences of both anxiety and depression among a representative sample of first years vs. final year students. (d) Conducting the predictive analyses to explore the predictive nature of anxiety and depression in revealing academic stress in medical students.

The findings from this study can prove to be a great help in designing appropriate psychosocial intervention strategies to enhance the learning abilities of medical students and this stress management and psychological distress handling is likely to equip them to improve their psychological health so that they could acquire adequate medical knowledge and could make lesser blunders in their medical practice. This would consequently enable them to undertake the patient care by achieving sound psychological well-being. All this would perceptibly help in the toll of anxiety and depression attenuation.

## MATERIALS AND METHODS

**2.1. Study population:** The medical course at all medical colleges of Punjab is very tedious and demanding. The first year is marked as a phase of transition into medical college yet massive study toll is kept during this time. During this period, the students study core medical subjects, and then they move onto specialized clinical components and may proceed on from there to clinical or hospital placements, in their next three years. During this period, the curriculum focuses mainly on clinical subjects and skills and this is the time during which anxiety, depression and academic stress as reported by the students is less. This again rises epitome in final year when the students have to go through rigorous placements as well as through a competitive cumulative exam. Around 650 students, typically aged 18–19 years, entering first year to 23, 24 years for final year from faculty of medicine of six medical colleges were taken for the current research.

**2.2 Research Design:** The research was laid through cross sectional research design. Non probability purposive sampling technique was used for taking the sample. Through g power formula the calculated sample size was 350, but it was kept double just to increase the power of predictors in regression analyses for the current data.

**2.3 Data Collection:** The selected students were personally contacted, informed consent was obtained and they were briefed about the questionnaire, the aims and advantages etc. were explained and then they were requested to give responses on the questionnaires. Confidentiality was ensured. All first year and final year medical students were contacted directly in and after the end of their classes. The response rate was 98 % and it took on average twenty minutes to complete the questionnaires. The study was held in the second month of the commencement of the first year classes, to ensure that the students would be reporting the stress related to their academics. Just as the data from final year students was collected two months prior to their pass out exam.

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**2.4 Measures:** Students' Depression Inventory (SDI) is a twenty-one-multiple choice question self-report inventory. There are five possible answers to each question. Each answer is given a score from zero to five, which indicates how much the symptoms are chronic and severe. It is considered as one of the best used tools to assess depression in students and effectively predict its severity. This tool can measure mood, pessimism, sense of failure, self-dissatisfaction, guilt, punishment, self-dislike, self-accusation, suicidal ideas, irritability, social withdrawal, crying episodes, changes in perceived body image, work-related difficulties, insomnia, fatigue, appetite, weight loss, bodily preoccupation, and loss of libido. Items one to thirteen measure symptoms that are psychological in nature, while items fourteen to twenty-one measure more physical symptoms. The cut off points were computed and its norms were developed for determining the severity of depression ranges.

Another measure to assess anxiety was Beck anxiety inventory (BAI) that is a twenty-one-multiple-choice question self-report inventory. It mainly measures common symptoms of anxiety (including numbness and tingling, sweating that is predominantly not due to heat and fear of the most awful happening). The questionnaire is most apt to be used for persons between the ages from seventeen to eighty years. BAI-1 scores were categorized into very low anxiety (1–21), moderate anxiety (22–35) and severe anxiety (more than 36). Student's Depression Inventory and BAI were given to the medical students in Urdu version as it is the mother tongue of most of the students in Pakistan and this helped in ensuring that it was fully understood.21,22 The demographic variables included gender, age (18–20), year of study etc. Academic Stress was measured through Student Academic Stress Scale (SASS) Busari (2011). The SASS is a self-reported scale for measuring stress among students. The SASS is an effective measure of stress response developed specifically for quantifying stress on college and University students. As far as the stress response domains are concerned, they include physiological, behavioral, cognitive and affective areas. The respondents rate how much of the time they experience symptoms of stress on a 5-point Likert scale with the response options of none of the time "(1) A little of the time (2) some of the time (3) most of the time (4) and all of the time (5)" items are summed for subscale scores and subscales are summed for a total of SASS stress response score. Higher scores indicate a greater stress response.

**2.5. Data analysis:** The collected data were analyzed using SPSS version 21.00. For analyses purposes, demographic and inferential analyses were undertaken. The cut-off score computed from quartiles were used for depression using 17 or more, while that of the anxiety using BAI was 22 or more.

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**RESULTS**

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**3.1.** The distribution of investigated medical students according to age, gender, anxiety and depression levels as well as on academic stress were mapped. In First years' medical students, the anxiety level was found 83.9% and 67.9%, from first year to final year while depression was 65 % to $5 % from first year to final year respectively.

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**Table 1 Frequencies, and Percentages of Demographic Variables of Medical Students (N=325+325)**

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| Variables | Students from First year (n=325) | | | | Students from final year(n=325) | | | |
|---|---|---|---|---|---|---|---|---|
| | Frequencies | Percentages | M | SD | Frequencies | Percentages | M | SD |
| Gender | | | | | | | | |
| Male | 175 | 25% | | | 175 | 25% | | |
| Female | 175 | 25% | | | 175 | 25% | | |
| Age (in years) | (19-20 years) 325 | | 19.55 | 0.23 | (24-25 years) 325 | | 24.02 | 0.12 |

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*Note. M=Mean; SD=Standard deviation*

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In order to check the reliability of the questionnaire for this research project Cronbach's alpha reliability analysis was carried out. Reliability analysis shows that the reliability coefficients given in the table are significantly adequate and support the use of these instruments in the present study.

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**Table 2 Cronbach Alpha Reliability of Study Variable:** *Showing Mean, Standard Deviation and Cronbach's Alpha of the Scales (n=650)*

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| Scale | No. of items | M | SD | α |
|---|---|---|---|---|
| *Student Depression Inventory* | 21 | 65.12 | 21.03 | .96 |
| *Beck Anxiety Inventory* | 21 | 48.33 | 11.21 | .87 |
| *Academic Stress Scale* | 50 | 78.75 | 13.19 | .89 |

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*Note. M=Mean; SD=Standard Deviation; α=Cronbach's alpha*

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It was hypothesized that there is likely to be the significant difference between anxiety, depression and academic stress from first year to third year students.

**Table 3 Independent Sample t-test for Comparing Difference in anxiety, depression and academic stress from first year to third year medical Students. (N=300)**

| Variables | First Year students | | Final Year students | | | | 95% CI | |
|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *t* | *p* | *LL* | *UL* |
| Anxiety | 93.22 | 12.03 | 78.28 | 11.33 | 9.23 | .000 | 13.17 | 10.91 |
| Depression | 88.15 | 19.06 | 66.05 | 17.51 | 10.23 | .000 | 36.23 | 26.64 |
| Academic Stress | 83.55 | 12.11 | 73.12 | 12.11 | 7.91 | .000 | 12.22 | 9.13 |

*Note. M= Mean; SD=Standard Deviation;CI= Confidence interval; LL= Lower limit; UL= Upper limit; SE= Self-efficacy; AM=Academic motivation; AS= Academic satisfaction; df= degree of freedom*
*df= 647, p= 0.05*

An independent sample t-test was conducted to compare the perceived anxiety, depression and academic stress that clearly showed that it was significantly higher for first year students than final year students.

**Table 4 Independent Sample t-test for Comparing Differences in anxiety, depression and academic stress across males and females (N=650)**

| Variables | Male Students (n= 325) | | Female Students (n= 325) | | | | 95% CI | |
|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *t* | *p* | *LL* | *UL* |
| Anxiety | 30.40 | 10.18 | 39.47 | 7.34 | -8.85 | .000 | -11.09 | -7.05 |
| Depression | 14.53 | 4.51 | 18.77 | 4.04 | -8.55 | .000 | -5.20 | -3.25 |
| Academic Stress | 30.43 | 10.84 | 39.73 | 6.64 | -8.96 | .000 | -11.35 | -7.26 |

*Note. M= Mean; SD=Standard Deviation; CI= Confidence interval; LL= Lower limit; UL= Upper limit; M= Motivation; CQ= Career and qualifications; S.Enj; Social enjoyment; S.Ex= Self-exploration; SP= Social pressure; Alt= Altruism; S=Satisfaction; OS= Overall satisfaction; CS= Campus satisfaction; ES= Education and teaching satisfaction; SS= Social satisfaction; df= degree of freedom*
*df= 298, p= 0.05*

Independent sample t-test was carried out in order to compare the perceived anxiety, depression and reported academic stress level differences from male to females and this was revealed that females report greater anxiety, depression and academic stress.

**Table 5 Analysis of Variance (ANOVA) for Comparing academic stress with Income of Students (n=650)**

| Source | df | $H^2$ | f | P |
|---|---|---|---|---|
| Income | | | | |
| Between groups | 5 | 1123.33 | 1.066 | .279 |
| Within groups | 645 | 1338.63 | | |

*Note.$\eta^2$=Mean square; df=644, p<0.05*

**Table 6 Pearson Product Moment Correlation Showing relationship in the Study Variables**

| Study Variables | 1 | 2 | 3 |
|---|---|---|---|
| 1.Perceived Stress | | .75** | .64* |
| 2.Anxiety | | | .71** |
| 3.Depression | | | |

*p<0.05*

**Table7 Regression Analyses for Predicting Role of Anxiety and Depression in Academic Stress Standard multiple regression predicting stress**

| Variables | β | Unstandardized β | Std Error | 95% CI |
|---|---|---|---|---|
| Age | -0.31 | -0.23 | 0.45 | [-0.23,-0.04] |
| Gender | -0.43 | -6.34 | 2.13 | [-0.54, 0.58] |
| Income | 0.01 | 0.05 | 0.43 | [-0.54, 0.56] |
| Year of Study | 0.18 | 0.47 | 0.77 | [-0.14,0.56] |
| Hours of study per day | 0.12 | 0.27 | 0.17 | [-0.14, 0.48] |
| Anxiety State | 0.12 | 0.54 | 0.23 | [-0.21, 0.76] |
| Anxiety Trait | 0.02 | 0.34 | 0.06 | [0.32, 0.81] |
| Depression | 0.13 | 0.65 | 0.07 | [0.25, 0.43] |

*Coding of sex: 1 = male and 2 = female.; **p < 0.01 two-tailed,; ***p < 0.001 two-tailed.*

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The mean difference in income of students with academic stress level was investigated by using one way ANOVA (Analysis of variance). There were no significant differences in the academic stress among medical students with reference to income level.

## DISCUSSION

Medical colleges has long been recognized as numerous stressors that can affect the psychological well-being of students.23 Anxiety and depression are wide-reaching problems which devastate the psychological health of the people.24 The mental states of medical students has been an essential issue to be taken under consideration, reported in 1956,25 as it is more likely to be affected by many stressors such as examining stress which will in consequence direct a series of consequences at both personal and professional ends. Numerous studies have reported major distress among medical students.28–32 Contrarily, some studies encompass little or no evidence of stress among medical students.26,27 In this research, among the medical students, 43.9% students were suffering from anxiety and 57.9% are suffering from depression. Therefore, the study reveals significant distress among both medical students. Furthermore, it was concluded that the occurrence of anxiety in first year students was establish higher than that in the final year students. Also, the frequency of depression, anxiety and resulting academic stress was larger in females as compared to males. A number of researchers contributed this conclusion that medical students pass through continuous examinations throughout their academic years of medical education. Studying medicine is competitive, demanding and requires colossal efforts. Several academic stressors were reported in a lot of prior researches but none of them had urged the need to highlight the urgency of this phenomenon so that this could timely be curbed .33 In addition, medical students tend to be more publicly isolated than other students of different faculties. Medical students may get influenced by all these states of anxiety, stress and depression much more frequently. The current findings discovered that there are differences in anxiety and depressive symptoms across gender groups. The occurrence of the symptoms of stress was higher among females. Different studies corroborate the current research findings in reporting higher levels of depression between females.34,35 This is maybe due to the fact that (1) females criticize more about the high load of the curriculum, (2) they are expected more to report stress,37 (3) females are more responsible to over complaint about physical and psychological symptoms,38 and (4) female faced less job opportunities than males in eastern countries.

## CONCLUSION

The study reveals significant distress among both medical and pharmaceutical students. Moreover, it was concluded that the prevalence of anxiety and depression in Faculty of Medicine was found higher than that in Faculty of Pharmacy. Furthermore, it was noticed that the prevalence of symptoms was higher among females. Medical students with anxiety and depression if identified early can be managed by behavioral therapy, emotional support, interpersonal psychotherapy, social skill training etc., this may help the young medicos to overcome their difficulties and lead a healthier life. 6. Limitations In this study, some limitations should be considered. One of those limitations is possibility of biased sampling because samples were randomly selected from the selective main medical colleges. Generalizing our results to all medical students is hard. The second point is that family history of depression and stressful events was not taken into consideration. Further studies should take these limitations including genetic and environmental problems into consideration. Lastly, not enough sample size was selected, so larger sample size should be considered in future studies.

## REFERENCES

[1] Bostanci M, Ozdel O, Oguzhanoglu NK, Ozdel L, Ergin A, et al. Depressive symptomatology among university students in Denizli, Turkey: prevalence and sociodemographic correlates. Croat Med 2005;46(1):96–100. 2.

[2] Eller T, Aluoja A, Vasar V, Veldi M. Symptoms of anxiety and depression in Estonian medical students with sleep problems. Depress Anxiety 2006;23(4):250–6.

[3] Kumar Ganesh S, Jain Animesh, Hegde Supriya. Prevalence of depression and its associated factors using Beck depression inventory among students of a medical college in Karnataka. Indian J Psychiatry 2012;54(3):223–6.

[4] Quince Thelma A, Wood Diana F, Parker Richard A, Benson John. Prevalence persistence of depression among undergraduate medical students: a longitudinal study at one UK medical school. BMJ 2012;2(4):e001519.

[5] Sidana Surbhi, Kishore Jugal, Ghosh Vidya, Gulati Divyansh, Jiloha RC, Anand Tanu. Prevalence of depression in students of a medical college in New Delhi: a cross-sectional study. Australas Med J 2012;5(5):247–50.

[6] Kessler RC, Walters EE. Epidemiology of DSM-III-R major depression and minor depression among adolescents and young adults in the National Comorbidity Survey. Depress Anxiety 1998;7(1):3–14.

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[7] Hysenbegasi A, Hass SL, Rowland CR. The impact of depression on the academic productivity of university students. J Ment Health Policy Econ 2005;8(3):145–51.

[8] Sobocki P, Jonsson B, Angst J, Rehnberg C. Cost of depression in Europe. J Ment Health Policy Econ 2006;9(2):87–98.

[9] Sobocki P, Lekander I, Borgstrom F, Strom O, Runeson B. The economic burden of depression in Sweden from 1997 to 2005. Eur Psychiatry 2007;22(3):146–52.

[10] Firth-Cozens J, Greenhalgh J. Doctors' perceptions of the links between stress and lowered clinical care. Soc Sci Med 1997;44:1017–22.

[11] Barnes L. B., Agago M. O., Combs W. T. (1998). Effects of job-related stress on faculty intention to leave academia. Res. High. Educ. 39, 457–464 10.1023/A:1018741404199

[12] Kessler RC. Epidemiology of women and depression. J Affect Disord 2003;74:5–

[13] M.B. Ibrahim, M.H. Abdelreheem among US and Canadian medical students. Acad Med 2006;81:354–73.

[14] Dahlin ME, Joneborg N, Runeson B. Stress and depression among medical students: a cross-sectional study. Med Educ 2005;39:594–604.

[15] Sreeramareddy CT, Shankar PR, Binu VS, et al. Psychological morbidity, sources of stress and coping strategies among undergraduate medical students of Nepal. BMC Med Educ 2007;7:26.

[16] Mancevska S, Bozinovska L, Tecce J, et al. Depression, anxiety and substance use in medical students in the Republic of Macedonia. Bratisl Lek Listy 2008;109:568–72.

[17] Al-Dabal Badria K, Koura Manal R, Parveen Rasheed, AlSowielem Latifa, Makki Suhair M. A comparative study of perceived stress among Female Medical and Non-Medical University Students in Dammam, Saudi Arabia. Sultan Qaboos Univ Med J 2010;10(2):231–40.

[18] Bazmi Inam SN. Anxiety and depression among students of a Medical College in Saudi Arabia. Int J Health Sci (Qassim) 2007;1(2):295–300.

[19] Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. Arch Gen Psychiatry 1961;4: 561–71.

[20] Beck AT et al. An inventory for measuring clinical anxiety: psychometric properties. J Consult Clin Psychol 1988;56(6):893–7.

[21] West J. An Arabic validation of a depression inventory. Int J Soc Psychiatry 1985;31(4):282–9.

[22] AI-Issa lhsan, AI Zubaidi Abdulgawi, Bakal Donald, Tak S. Fung Beck anxiety inventory symptoms in Arab college students. Arab J Psychiatry (AJP) 2000;11(1).

[23] Khan MS, Mahmoud SF, Badshah A, Ali SU, Jamal Y. Prevalence of depression, anxiety and their associated factors among medical students in Karachi, Pakistan. J Pak Med Assoc 2006;56:583–6.

[24] Mitchell RE, Mathews JR, Grandy TG. The question of stress among first year medical students. J Med Educ 1983;58:367–72.

[25] Saslow G. Psychiatric problems of medical students. J Med Educ 1956;31:27–33.

[26] Vaz RF, Mbajiorgu EF, Acuda SW. A preliminary study of stress levels among first year medical students at the University of Zimbabwe. Cent Afr J Med 1998;44:214–9.

[27] Bramness JA, Fixdal TC, Vaglum P. Effect of medical school stress on the mental health of medical students in early and late clinical curriculum. Acta Psychiatr Scand 1991;84:340–5.

[28] Clark DC, Zeellow PB. Vicissitudes of depressed mood during four years of medical school. JAMA 1988;260:2521–8.

[29] Vitaliomo PP. A biopsychosocial model of medical student distress. J Behav Med 1988;11:311–3.

[30] Inam SN, Saqib A, Alan E. Prevalence of anxiety and depression among medical students of a private university. J Pak Med Assoc 2003;53:44–7.

[31] Davilia J, Hammen C, Burge D, Paley B, Daley S. Poor interpersonal problem solving as a mechanism of stress generation in depression among adolescent women. J Abnorm Psychol 1995;104:592–600.

[32] Lamerine RJ. Child and adolescent depression. J Sch Health 1995;65:390–3.

[33] Mikolajczyk R, Maxwell A, El Ansari W, Naydenova V, Stock C, et al. Prevalence of depressive symptoms in university students from Germany, Denmark, Poland and Bulgaria. Soc Psychiatry Psychiatr Epidemiol 2008;43(2):105–12.

[34] Franko DL, Striegel-Moore RH, Bean J, Barton BA, Biro F, et al. Self-reported symptoms of depression in late adolescence to early adulthood: a comparison of African-American and Caucasian females. J Adolesc Health 2005;37(6):526–9.

[35] Wade TJ, Cairney J, Pevalin DJ. Emergence of gender differences in depression during adolescence: national panel results from three countries. J Am Acad Child Adolesc Psychiatry 2002;41(2):190–8.

_____

[36] Verbuegge LM. Gender and health: an update on hypothesis and evidence. J Health Soc Behav 1985;26:156–82.

[37] Bostanci M, Ozdel O, Oguzhanoglu NK, Ozdel L, Ergin A, et al. Depressive symptomatology among university students in Denizli, Turkey: prevalence and sociodemographic correlates. Croat Med J 2005;46(1):96–100.