Research Paper

Comparative Characteristics for the Influence of Academic Stress on the Mental Health of the Medical and Pedagogical Senior Students

Victoria V. Ruzhenkova[1]*, Victoria B. Tarabaeva[1], Uliana S. Moskvitina[1], Inna S. Khamskaya[1], Alevtina V. Boeva[1]

1. Department of Psychiatry, Narcology and Clinical Psychology, Belgorod State University, Belgorod, Russia.

Use your device to scan and read the article online

Citation Ruzhenkova VV, Tarabaeva VB, Moskvitina US, Khamskaya IS, Boeva AV. Comparative Characteristics for the Influence of Academic Stress on the Mental Health of the Medical and Pedagogical Senior Students. Iranian Rehabilitation Journal. 2022; 20(1):117-126. http://dx.doi.org/10.32598/irj.20.1.1653.1

http://dx.doi.org/10.32598/irj.20.1.1653.1

Article info:
Received: 05 Nov 2021
Accepted: 27 Nov 2022
Available Online: 29 Jun 2022

Keywords:
Medical students, Depression, Stress disorders, Anxiety, Mental health

ABSTRACT

Objectives: Academic stress negatively affects the students' mental state, leading to lower academic performance, reduction in the level of professional training, and success in the future.

This study aims to investigate the medical and psychological status of senior students in medical and pedagogical departments. We hope to propose some recommendations for preventing maladaptation associated with stressful influences

Methods: This research is a descriptive and comparative study and investigates the mental health of senior students. A consecutive sample of 192 fifth-year students was selected by convenience sampling method. They were examined using the medico-sociological and psychometric methods. There were 137 students of medical and 55 pedagogical students aged 20-29 years (Mean±SD=21.8±1.2 years; 142 women and 50 men). The participants completed the test for academic stress, social phobia inventory, Beck depression inventory-2, Beck anxiety inventory, and depression, anxiety, and stress scale-21 (Lovibond, Lovibond). The obtained data were analyzed in SPSS software v. 16.

Results: There are many differences between the mental health status of the study groups. These differences comprise suicide ideation, suicide attempt, depression, and symptoms of social phobia. However, there were no differences between study groups regarding anxiety, high academic load, and disappointment in the profession, and manifestations of educational stress, including fatigue and psychosomatic symptoms. The routine methods for overcoming stress were drinking alcohol (most often among medical students), smoking, and taking non-prescription sedatives, which was a risk factor for addictive behaviors.

Discussion: It is necessary to develop and implement psychoeducational programs for medical and pedagogical students to acquire adaptive skills to overcome stress and reduce anxiety and depression, eventually preventing the development of psychosomatic disorders and addictions.

*** Corresponding Author:**
Victoria V. Ruzhenkova, PhD.
Address: *Department of Psychiatry, Narcology and Clinical Psychology, Belgorod, Russia.*
Tel: +007 (4722) 30-14-03
E-mail: *ruzhenkova@bsu.edu.rus*

Highlights

- There are many differences in the mental health statuses of medical and pedagogical senior students.
- Effective treatment for stress reduction is necessary for university students.

Plain Language Summary

Academic stress adversely affects the students' mental state. Stress deteriorates academic performance and decreases professional training and success in the future. This study aimed to analyze the psycho-medical states of medical and pedagogical senior students to develop recommendations for preventing maladaptation associated with stressful situations. The results indicate several differences between the mental states of medical and pedagogical students. It is necessary to develop psychoeducational programs for medical and pedagogical students, a program aimed at acquiring adaptive skills to overcome stress and reduce anxiety and depression. A practical treatment will prevent the development of psychosomatic disorders and addictions.

1. Introduction

In the past decade, the problem of studying mental health among students of higher educational institutions has become increasingly popular [1, 2] since symptoms of depression, anxiety, and distress are more common among students than their peers [3-6] as well as the general population [7].

Academic anxiety refers to a group of mental and behavioral responses when a person is worried about potential failure on an exam or similar evaluation condition [8, 9]. Academic stress adversely affects students, their performance, and overall health, causing anxiety and depression, reducing life satisfaction, increasing the risk of developing gastrointestinal diseases [10-12], and decreasing the level of professional training and future success [6]. Students experiencing distress are 2-4 times more likely to use psychoactive substances (drugs, alcohol) and smoke tobacco [13, 14].

High levels of stress adversely impact academic performance [15] and result in having suicidal ideation in the vast majority of medical students [16, 17].This study aims to investigate the medical and psychological status of senior students in medical and pedagogical departments. We hope to propose some recommendations for preventing the maladaptation associated with stressful influences.

2. Materials and Methods

This research is a descriptive and comparative study. We investigated the mental health status of the senior students. From 2018 to 2019, a consecutive sample of 192 fifth-year students was examined using the medico-sociological and psychometric methods. There were 137 medical (first group) and 55 pedagogical (second group) students aged 20-29 years (Mean±SD: 21.8±1.2 years; 142 women and 50 men). They were selected by the convenience sampling method. The inclusion criteria were as follows: studying at one of the medical or pedagogical schools and aged under 30. The exclusion criteria include having a severe physical or mental illness, receiving psychiatric treatment, or any psychotherapy. Participants completed the test for academic stress [18], social phobia inventory [19], Beck depression inventory-II [20], Beck anxiety inventory [21], depression anxiety, and stress scale-21 [22].

Study instruments

Medical and sociological questionnaire

This researcher-made questionnaire investigates sociodemographic information, adaptation problems to the educational process, attitude to the chosen specialty, studying, and living conditions.

Test for academic stress

Shcherbatykh [18] developed a test for academic stress. This questionnaire has recently become a widespread scale in research in Russia. The questionnaire, despite its brevity, is quite comprehensive. It includes responses to a wide range of items. The instrument especially recognizes the contribution of components of academic anxiety, the level of pretest anxiety, paths to reduce academic anxiety, and somatic and psychological symptoms of stress [23].

Social Phobia Inventory (SPIN)

The social phobia inventory (SPIN) [19] is a 17-item self-report inventory for social anxiety symptoms that assesses the clinically significant symptoms of social anxiety disorder. The SPIN has satisfying test-retest reliability, inner consistency, and diverging and concurrent validity. The cut-off point of the SPIN is 19, which identifies persons with and without a social anxiety disorder. The SPIN was sensitive to the improvement of signs across time and displayed varying responses to medication and placebo. The exploratory factor analysis distinguished five dimensions.

Beck Depression Inventory-II (BDI-II)

The Beck depression inventory-II (BDI-II) is a 21-item self-report index generally applied to the dimensions of the appearance and quality of depression among people. The widely used form of the BDI is BDI-II, developed by Beck and his colleagues. Participants can personally answer the BDI-II. It is verified for assessment of 13- to 80-year-old persons. The BDI has excellent test-retest reliability (r=0.93); it also has high inner consistency (α=0.91). This instrument assesses somatic and cognitive signs of depression 20).

Beck Anxiety Inventory (BAI)

The Beck anxiety inventory (BAI) is a 21-item scale that showed high inner consistency (α=0.92) also test-retest reliability across seven days (r81=0.75). The inventory could distinguish the diagnostic samples with anxiety-related disorders such as panic disorder (PD) and generalized anxiety disorder (GAD) from the different samples without anxiety-related disorders such as major depressive disorder (MDD), dysthymic disorder, etc. In addition, the BAI was slightly associated with the revised Hamilton's anxiety rating scale (r-HARS, r150=0.51) [21].

Depression Anxiety and Stress Scale-21 (DASS-21)

The depression anxiety and stress scale-21 (DASS-21) is a compact self-report of the DASS-42 that measures the negative emotional elements of depression, anxiety, and stress [22]. It has high Cronbach α values of 0.81, 0.89, and 0.78 for the subscales of depression, anxiety, and stress, respectively. It also has excellent internal consistency and parallel reliabilities, and discriminant and converging validities.

The descriptive statistics included the median and interquartile range. We also used the statistical methods of nonparametric statistics like the Chi-square test with Yates' correction for continuity, the Mann-Whitney test for comparing independent groups, and dominant component factor analysis with varimax rotation.

3. Results

It has been established that women are interested in medical and pedagogical specialties, which make up 3/4 of the study groups. The overwhelming majority of medical and pedagogical students (78.9% and 76.4%, respectively) enterthe course of their free will. At the same time, more than 21% (one in five) of medical and 29% (almost one in three) of pedagogical students entered an institute of higher education on the advice of their relatives.

The study of commitment to career choice (the answer to the question "If it were possible to turn back the clock and you had a choice, would you choose it again, or choose another profession?") showed that more than half of the pedagogical students (52.7%) and more than a third of the medical ones (35.0%) would choose another profession (χ^2=3.943, P=0.047, Odds Ratio [OR]=2.0, 95% CI=1.0-4.0). The probability of disappointment in the profession among pedagogical students is two times higher than that of medical ones.

Among medical students who entered this discipline based on their initiative, only 70.4% would again choose the medical profession, and a third (29.6%) would choose another. Among those who entered "on advice," 44.8% would choose a medical specialty, and the remaining 55.2% would prefer another proficiency (χ^2=5.479, P=0.02, OR=2.9, 95% CI=1.2-7.4). The probability of a voluntary withdrawal is almost three times higher for those who entered not on their initiative than those who made a conscious choice.

Among the pedagogical students who entered based on their initiative, 61.5% would enter again, and 38.5% would choose another profession. Of those who entered "on advice," only 12.5% would re-enter, and 87.5% would prefer another profession (χ^2=9.067, P=0.0035, OR=11.2, 95% CI=2.0-83.3). The probability of a voluntary withdrawal among pedagogical students who did not choose based on their initiative is at least 11 times higher than with a conscious choice of profession.

The study of gender differences showed that the majority, i.e., 81% of females and only 38.5% of males, entered university on their initiative (χ^2=6.751, P=0.01,

Table 1. Comparative assessment of learning environment (in points: from 1 to 10)

No.	Learning Environment	Medical Students		Pedagogical Students		P
		Median	Q_{25-75}	Median	Q_{25-75}	
1	Comfort	5.0	4.0-7.0	7.0	6.0-8.0	0.000
2	The quality (comprehensibility) of lectures	6.0	5.0-7.0	8.0	7.0-9.0	0.000
3	Correspondence of textbooks to the subject	3.0	2.0-5.0	7.0	4.0-8.0	0.000
4	Reality of expectations	5.0	3.0-7.0	6.0	4.0-8.0	0.000
5	Motivation to study in the last 2 weeks	7.0	5.0-7.0	5.0	3.0-8.0	0.032
6	Teaching quality	6.0	5.0-8.0	9.0	7.0-9.0	0.000

Iranian Rehabilitation Journal

OR=6.8, 95% CI=1.5-33.5). The numbers indicate that males are over six times more likely not to enter a pedagogical institute on their initiative than females.

The study of students' assessment of the learning environment (Table 1) shows that the students of pedagogical institute had significantly higher comfort, quality of lectures, reality of expectations, and teaching quality compared to medical students (P=0.000). The differences were in terms of comfort, quality (comprehensibility) of lectures, inconsistency of the textbooks with the curriculum topic, and teaching quality. At the same time, the attitude and the motivation to study were higher among medical students. The lowest score, i.e., 3 points out of 10 according to the median value, was given by medical students to educational materials.

Verifying comparative characteristics for the degree of academic stress factor significance (Table 2) demonstrated that the groups did not differ in most parameters. For medical students, the imperfection of textbooks (lack of them or inconsistency with the curriculum topic) and fear of the future were more significant than for pedagogical students. Also, for pedagogical students, lack of money (with a median score of 6 points, Q_{25-75} in the range of 3-9 points) was more significant. Students of both groups assessed the degree of "academic load" in the same way: Me=8.0 points, Q_{25-75} in the range of 6-9-points.

Factor analysis of academic stress factors revealed 2 significant factors among medical students (41.3% of the variance): "high academic load" (29.7%) and "disappointment in the profession" (11.6%). Also, factor analysis revealed 3 factors among pedagogical students (56.4% of the variance): "unwillingness to study" (39%), "domestic conflicts" (9.9%), and "domestic problems" (8.4%). These data indicate that for pedagogical students, the most significant factor was the unwillingness to study due to disappointment in the profession, defective educational materials, and high academic load, as well as problems of interpersonal interaction and conflicts. At the same time, for medical students, a high academic load was significant, and then disappointment in the profession, followed by an unwillingness to study.

The study of comparative characteristics on the severity of symptoms of academic stress (Table 3) showed that among medical students, difficulty focusing, irritability, resent-

Table 2. Comparative characteristics of the academic stress factor significance

No.	Academic Stress Factors	Medical Students		Pedagogical Students		P
		Median	Q_{25-75}	Median	Q_{25-75}	
1	Lack of textbooks	6.0	4.0-9.0	2.0	0.0-5.0	0.000
2	Incomprehensible, boring textbooks	5.0	3.0-8.0	3.0	1.0-5.0	0.001
3	Lack of money	4.0	1.0-8.0	6.0	3.0-9.0	–0.044
4	Fear of the future	5.0	3.0-8.0	4.0	0.0-7.0	0.025

Only statistically significant differences are given.

Iranian Rehabilitation Journal

Table 3. The severity of symptoms for academic stress

No.	Symptoms of Academic Stress	Medical Students		Pedagogical Students		P
		Median	Q_{25-75}	Median	Q_{25-75}	
1	Increased distractibility	4.0	2.0-7.0	3.0	1.0-6.0	0.023
2	Irritability, resentment	3.0	2.0-5.0	2.0	0.0-5.0	0.020
3	Low mood	4.0	2.0-6.0	2.0	0.0-5.0	0.005
4	Loss of confidence	3.0	1.0-6.0	1.0	0.0-4.0	0.013
5	Hurry, lack of time	6.0	4.0-8.0	5.0	1.0-8.0	0.034
6	Fatigue	5.0	3.0-7.0	3.0	0.0-6.0	0.000

Only statistically significant differences are given.

Iranian Rehabilitation Journal

ment, low mood, decreased self-esteem, feeling of lack of time, and increased fatigue were more pronounced.

Pedagogical students who entered the training unwillingly, more than those who chose a profession willingly, perceived academic stress factors: the teachers' strictness (P=0.015), distance from parents (P=0.025), lack of scholarship (P=0.019), and fear of the future (P=0.042). In addition, they had more pronounced symptoms of academic stress: feelings of helplessness (P=0.016), difficulty focusing (P=0.003), anxiety (P=0.009), feeling of lack of time (P=0.007), palpitation (P=0.004), and laborious breathing (P=0.006).

Factor analysis of the academic stress symptoms demonstrates that they are the same for the students of both groups (Table 4). The most significant differences are fatigue and psychosomatic symptoms.

According to the methods of coping with academic stress, the groups did not differ significantly. Pedagogical students often skipped classes, chatted with friends, used the Internet, and read fiction.

Academic anxiety self-assessment proved to be high in both groups (median of 0.9 points in the medical students and 0.8 in the pedagogical students), and medical students rated it higher. Extremely high academic anxiety (8-10 points) was typical for 75.2% of medical students and 58.2% of pedagogical students (χ^2=4.002, P=0.046, OR=2.1, 95% CI=1.0-4.3). The odds ratio showed that medical students were twice as likely to have academic anxiety.

The most significant pretest stress symptoms in both groups were anxiety, fear, sleep-onset insomnia, and a feeling of heart failure. Medical students were significantly more likely to experience feelings of heart failure and frequent urination.

Table 4. Factor analysis of academic stress symptoms

Medical Students	Pedagogical Students
Name and components of the factor (61.4%)	Name and components of the factor (76.5%)
Asthenia (42.8%) Influxes of extraneous thoughts, 0.834; Difficulty focusing, 0.812.	Asthenia (58.8%) Difficulty focusing - 0.930; Feeling of helplessness - 0.811; Influxes of extraneous thoughts - 0.794; Anxiety - 0.788; Lack of time - 0.729
Psychosomatic symptoms (11.5%) Laborious breathing - 0.869; Heart palpitation - 0.808; Muscle tension - 0.776	Psychosomatic symptoms (10.1%) Gastrointestinal problems - 0.873; Headache - 0.841; Low mood - 0.735
Time trouble (7.1%) Headache - 0.746; Lack of time - 0.713	Muscle tension (7.6%) Muscle tension - 0.856; Laborious breathing - 0.768

Iranian Rehabilitation Journal

Table 5. Factor analysis of pre-examination stress symptoms

Medical Students	Pedagogical Students
Name and components of the factor (68.1%)	Name and components of the factor (74.2%)
Psychosomatic symptoms (46.1%) Impossibility of a deep breath - 0.877; Dissatisfaction with the breath - 0.857; Laborious breathing - 0.834.	Affective Disorders (51.6%) Depressed mood - 0.884; Alarm - 0.858; Muscle tension - 0.774.
Affective Disorders (14.0%) Sleep-onset insomnia - 0.790; Anxiety - 0.759; Poor sleep quality - 0.739; Depressed mood - 0.719; Heart palpitation - 0.700.	Psychosomatic symptoms (14.4%) Impossibility of a deep breath - 0.970; Dissatisfaction with inspiration - 0.941; Feeling of heart failure - 0.823; Laborious breathing - 0.729.
Muscle tension (8.0%) Muscle tension - 0.835; Muscle tremors - 0.784.	Dysuria symptom (8.2%) Rapid urination - 0.744

Iranian Rehabilitation Journal

Factor analysis of the pre-examination stress symptoms revealed three significant factors (Table 5).

It is known that psychosomatic symptoms are more significant for medical students, and affective disorders are more significant for their peers from the pedagogical institute.

Verification of the social phobia prevalence shows that among medical students, symptoms of social phobia are significantly more common (χ^2=4.948, P=0.027, OR=2.3, 95% CI=1.1-4.8) than in the pedagogical students: 46% and 27.3% of cases, respectively. The probability of having social phobias in medical students is more than two times higher than in pedagogical students. The clinical level of social phobia (moderate, pronounced, and highly pronounced) was significantly more common in medical students (24.1%) than in peers from the pedagogical institute (7.3%) (χ^2=64.093, P=0.014, OR=4.0, 95% CI=1.3-14.3). The probability of diagnosing the clinical level of social phobia among medical students is four times higher than among pedagogical students.

It was found (DASS-21 test) that depression occurred in 41.6% of medical students, significantly more often than in the second group, 23.6%. Anxiety was detected in 44.5% of medical students and 30.9% of pedagogical students (the differences were not statistically significant). The stressors were experienced equally often by students of both groups, 37.9% of medical students and 32.7% of pedagogical students, respectively.

The results of the Beck depression and anxiety inventory (Table 6) confirmed the results of the DASS-21

Table 6. Results of the beck anxiety inventory and beck depression inventory

Severity		No. (%)	
		Medical Students	Pedagogical Students
Depression	None	74(54.0)	39(70.9)
	Mild	27(19.7)	5(9.1)
	Moderate	18(13.1)	4(7.3)
	Severe	12(8.8)	5(9.1)
	Extremely Severe	6(4.4)	2(3.6)
Anxiety	None	117(85.5)	49(89.1)
	Moderate	18(13.1)	5(9.1)
	Severe	2(1.4)	1(1.8)

Iranian Rehabilitation Journal

test and showed that depression in medical students (46% of cases) was recorded more often (χ^2=3.954, P=0.047, OR=2.1, 95% CI=1.0-4.3) than among pedagogical students (29.1%).

The odds ratio indicates that the probability of detecting depression in medical students is at least twice higher than in pedagogical students. Anxiety (according to the BAI) was equally frequent among students of both groups: 14.5% among medical students and 10.9% among pedagogical students.

4. Discussion

The study has revealed negative trends in commitment to the chosen profession among medical and pedagogical students. Moreover, the probability of disappointment in the profession among those who entered not on their initiative is three times higher among medical students and 11 times higher among pedagogical students. Differences in the significance of stress factors for different areas of study have been revealed, too.

The prevalence of extremely high (8-10 points) academic anxiety was more ordinary for medical students (75.2%) than for pedagogical students (58.2%). Among the symptoms of pre-examination stress, psychosomatic symptoms were more significant for medical students, and affective disorders were more significant for their peers from the pedagogical institute.

Depression was at least two times higher among medical students than pedagogical students. They were also more likely to have symptoms of a social phobia than pedagogical students, with a four times higher probability of a diagnosis of clinical level. These results are supported by some studies [24-26] that university students experience high stress and anxiety levels. It was found that most medical students are anxious about having educational anxiety; they also have a greater risk of physical and psychological well-being concerns [24]. According to their educational experience, medical students experience sadness and worry. A pandemic circumstance also may increase such negative feelings. Stress adversely impacts their psychological, emotional, and physical well-being. High pressure may have harmful indications on cognitive capacity and education skills [24].

5. Conclusion

Academic anxiety has widely been observed in medical students. The results indicate that anxiety is higher in medical students. Studying medical science as a competitive situation is more significant for medical students than for pedagogical students. Competitive [27] and academic anxiety adversely affects the performance of individuals like athletes and students. It leads to depression, suicide ideation, and lower function. Because of the high level of academic stressors associated with social phobia, anxiety, depression, and many students with educational and occupational boredom and burnout, developing and implementing psychoeducational programs for medical and pedagogical students is necessary.

On the one hand, the interventions aim to form adaptive ways to overcome anxiety and depression, and stress reduction, which will prevent the development of psychosomatic disorders and addictions. On the other hand, enriching the lifestyles increases social adaptation and success in the future. We conclude that evidence-based treatments for stress reduction improve adaptive emotion regulation [28, 29] and lead to a higher quality of life for university students, especially students of medical sciences.

Ethical Considerations

Compliance with ethical guidelines

All ethical principles were considered in this article. The participants were aware of the aim of the study and its procedure. They were also assured about the confidentiality of their information and were free to leave the study whenever they wished. The research results would be available to them. Written informed consent was obtained from the participants.

Funding

This research did not receive any grant from funding agencies in the public, commercial, or non-profit organizations.

Authors' contributions

All authors equally contributed to preparing this article.

Conflict of interest

The authors declare no conflict of interest.

Acknowledgments

We would like to acknowledge the contribution of the participants and thank them for all those who assisted us in conducting the present study.

References

[1] Conley CS, Shapiro JB, Kirsch AC, Durlak JA. A meta-analysis of indicated mental health prevention programs for at-risk higher education students. Journal Of Counseling Psychology. 2017; 64(2):121.[DOI:10.1037/cou0000190] [PMID]

[2] Tung YJ, Lo KK, Ho RC, Tam WS. Prevalence of depression among nursing students: A systematic review and meta-analysis. Nurse Education Today. 2018; 63:119-29. [DOI:10.1016/j.nedt.2018.01.009] [PMID]

[3] Dahlin M, Joneborg N, Runeson B. Stress and depression among medical students: A cross-sectional study. Medical Education. 2005; 39(6):594-604. [https://doi.org/10.1111/j.1365-2929.2005.02176.x] [PMID]

[4] Ibrahim AK, Kelly SJ, Adams CE, Glazebrook C. A system tic review of studies of depression prevalence in university students. Journal of Psychiatric Research. 2013; 47(3):391-400. [DOI:10.1016/j.jpsychires.2012.11.015] [PMID]

[5] Winzer R, Lindblad F, Sorjonen K, Lindberg L. Positive versus negative mental health in emerging adulthood: a national cross-sectional survey. BMC Public Health. 2014; 14:1238. [DOI:10.1186/1471-2458-14-1238] [PMID] [PMCID]

[6] Winzer R, Lindberg L, Guldbrandsson K, Sidorchuk A. Efects of mental health interventions for students in higher education are sustainable over time: A systematic review and meta-analysis of randomized controlled trials. PeerJ. 2018; 2;6:e4598. [DOI:10.7717/peerj.4598] [PMID] [PMCID]

[7] Rotenstein LS, Ramos MA, Torre M, Segal JB, Peluso MJ, Guille C, et al. Prevalence of depression, depressive symptoms, and suicidal ideation among medical students: systematic review and meta-analysis. Jama. 2016; 316(21):2214-36. [DOI:10.1001/jama.2016.17324] [PMID] [PMCID]

[8] Liu Y, Pan H, Yang R, Wang X, Rao J, Zhang X, Pan C. The relationship between test anxiety and emotion regulation: the mediating effect of psychological resilience. Annals of General Psychiatry. 2021; 20(1):1-9. [DOI:10.1186/s12991-021-00360-4] [PMID] [PMCID]

[9] Hammer CM, Scholz M, Bischofsberger L, Paulsen F, Burger PH. Feasibility of clinical hypnosis for test anxiety in first-year medical students. International Journal of Clinical and Experimental Hypnosis. 2020; 1;68(4):511-20. [DOI:10.1080/00207144.2020.1799379] [PMID]

[10] Reisbig AM, Danielson JA, Wu TF, Hafen Jr M, Krienert A, Girard D, Garlock J. A study of depression and anxiety, general health, and academic performance in three cohorts of veterinary medical students across the first three semesters of veterinary school. Journal of Veterinary Medical Education. 2012; 39(4):341-58. [DOI:10.3138/jvme.0712-065R] [PMID]

[11] Qamar K, Khan NS, Bashir Kiani MR. Factors associated with stress among medical students. Journal of Pakistan Medical Association. 2015; 65(7):753-5. https://pubmed.ncbi.nlm.nih.gov/26160086/

[12] Ruzhenkova VV, Tarabaeva VB, Ruzhenkov VA, Lukyantseva IS. Medical and psychological characteristics of the 1st year students of medical and pedagogical institutes and their features of educational adaptation. Drug Invention Today. 2018; 2:10. https://web.p.ebscohost.com/abstract?direct=true&profile=ehost&scope=site&authtype=76CN%3d133549300

[13] Ruzhenkova V. Educational stress as a factor of risk of the for the risk of formation of addictive behavior, alert and depressive disorders in foreign medical students. Research Result Medicine and Pharmacy. 2018; 4:55-68. [DOI:10.18413/2313-8955-2018-4-2-0-6]

[14] Melaku L, Mossie A, Negash A. Stress among medical students and its association with substance use and academic performance. Journal of Biomedical Education. 2015; 2015(4):1-9. [DOI:10.1155/2015/149509]

[15] Crego A, Carrillo-Diaz M, Armfield JM, Romero M. Stress and academic performance in dental students: The role of coping strategies and examination-related self-efficacy. Journal of Dental Education. 2016; 80(2):165-72. [DOI:10.1002/j.0022-0337.2016.80.2.tb06072.x] [PMID]

[16] Rosiek A, Rosiek-Kryszewska A, Leksowski Ł, Leksowski K. Chronic stress and suicidal thinking among medical students. International Journal of Environmental Research and Public Health. 2016; 13(2):212. [DOI:10.1155/2015/149509] [PMID] [PMCID]

[17] Ruzhenkova VV. [The prevalence and clinical structure of mental disorders in medical students (problems of primary and secondary psychoprophylaxis) (Russian)]. Research Result in Biomedicine, 2020; 6(1):135-53. [DOI:10.18413/2658-6533-2020-6-1-0-12]

[18] Shcherbatykh YV. [Psychology of stress and correction methods (Russian). SaintPetersburg: Piter; 2006. http://algoritm-centr.ru/en/history/yurii-viktorovich-shcherbatyh-psihologiya-stressa-i-metody-korrekcii-stress.html

[19] Connor KM, Davidson JR, Churchill LE, Sherwood A, Weisler RH, Foa E. Psychometric properties of The Social Phobia Inventory (SPIN): New self-rating scale. The British Journal of Psychiatry. 2000; 176(4):379-86. [DOI:10.1192/bjp.176.4.379] [PMID]

[20] Beck AT, Steer RA, Brown GK. Manual for the beck depression inventory-II. San Antonio, TX: Psychological Corporation. 1996; 1(82):10-37. [DOI:10.1007/978-1-4419-1005-9_441]

[21] Beck AT, Epstein N, Brown G, Steer RA. An inventory for measuring clinical anxiety: psychometric properties. Journal of Consulting and Clinical Psychology. 1988; 56(6):893. [DOI:10.1037//0022-006x.56.6.893] [PMID]

[22] Lovibond PF, Lovibond SH. The structure of negative emotional states: Comparison of the depression anxiety stress scales (DASS) with the beck depression and anxiety inventories. Behaviour Research and Therapy. 1995; 33(3):335-43. [DOI:10.1037/t01004-000]

[23] Sabirova RS, Umurkulova MM, Kuo BC. [Academic stress at different years of study (Russian)]. Bulletin of the Karaganda University. Pedagogy series. 2020; 100: 71-8 [DOI:10.31489/2020Ped4/71-78]

[24] Abdulghani HM, Sattar K, Ahmad T, Akram A. Association of COVID-19 pandemic with undergraduate medical students' perceived stress and coping. Psychology Research and Behavior Management. 2020; 13:871. [DOI:10.2147/PRBM.S276938] [PMID] [PMCID]

[25] Husky MM, Kovess-Masfety V, Swendsen JD. Stress and anxiety among university students in France during Covid-19 mandatory confinement. Comprehensive Psychiatry. 2020; 102:152-91.[DOI:10.1016/j.comppsych.2020.152191] [PMID] [PMCID]

[26] Miri Z, Razavi Z, Mohammadi S. [Evaluation of stress, anxiety, depression, and sleep disorders in medical students of Hamadan university of medical sciences, Iran, during the COVID-19 pandemic (Persian)]. Avicenna Journal of Clinical Medicine. 2021; 15;27(4):232-8. [DOI:10.52547/ajcm.27.4.238]

[27] Alavizadeh SM, Sobhi Gharamaleki N, Mami S, Mohammadzadeh J, Ahmadi V. The comparison impact of metacognitive therapy-based group intervention and group acceptance-based behavioral therapy on psychophysiological signs of professional soccer players in the U-19 league in Tehran (Persian)]. Zahedan Journal of Research in Medical Sciences 2020; 22(2):e92514. [DOI:10.5812/zjrms.92514]

[28] Alavizadeh SM, Sepahmansour M, Entezari S, Seirafi M, Sabet M. [Development and validation of emotion regulation strategies in germophobia questionnaire in Iran (Persian)]. Practice in Clinical Psychology. 2020; 10;8(4):307-16. [DOI:10.1007/978-981-16-5857-0_51]

[29] Wang S, Liu Y. Analysis of the Intervention of Yoga on Emotion Regulation Based on Big Data. In: International Conference on Cognitive based Information Processing and Applications (CIPA 2021) 2022 (pp. 402-409). Springer, Singapore. [DOI:10.1007/978-981-16-5857-0_51]

This Page Intentionally Left Blank