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Prevalence and dynamics of depression and anxiety in local and foreign medical students for a 6-year training period

Abstract

The academic load in medical institutes is 2 times higher than in other universities, and the training itself is emotionally stressful, which affects the students' health. A continuous sample of 1045 medical students from 1 to 6 year of education was examined: 724 local (Russian) and 321 foreign students (India). Depression was more common among Russian (28.7%) than foreign students (17.8%). Anxiety was equally common – 34.3-34%. Among foreign students, the highest prevalence of depression and anxiety was in the 1st year while among Russians it was 5th and 6th years. Depression was more often combined with anxiety in foreign students (82.5%) than in Russians (60.1%). The average level of correlation between depression and anxiety was revealed for both groups. The clinical level of distress was more common among Russian than foreign students, which is associated with the peculiarities of their attitude to the educational process.

Keywords: depression, anxiety, distress, medical students, comorbidity.

Introduction

The academic load in medical institutes, according to averaged estimates, is 2 times higher than in other colleges and universities (Leodoro and Lynn 2007), and the training itself is emotionally stressful. This affects the mental and somatic health of students (Klaperski et al.

2013; Almojali et al. 2017): the prevalence of stress and the frequency of mental disorders among young people aged 18-19 are higher than among middle-aged people (Abdel Rahman 2013; Dyrbye et al. 2014; Rotenstein et al. 2016).

Medical students have a high level of educational stress (Fawzy and Hamed 2017;

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Heinen et al. 2017; Moutinho et al. 2017; Wahed and Hassan 2017), especially those who are just starting their studies (Rosiek et al. 2016) Symptoms of educational stress are higher among foreign students who change living conditions (Rice and Dellwo 2002), know the local language worse, and live in a dormitory (Gupta et al. 2015; Wolf and Rosenstock 2017). They also have a higher risk of forming addictive behavior, anxiety and depressive disorders (Dyrbye et al. 2017; Ruzhenkova 2018; Smrcka, & Camska, 2016).

There is a widespread prevalence of depression and anxiety, which are significant predictors of educational stress and suicidal behavior (Masood et al. 2016; Silva et al. 2017). Premorbidity is detected more often among students of medical universities than among other students (Houpy et al. 2017; Ruzhenkova 2018) and are perceived by most students as “minor episodes of poor health” that do not require treatment. Most often they seek help in situations that are already critical to their mental health. At the same time, medical students with high levels of anxiety and depression often deny the availability of support or have difficulty accessing it (Brenneisen et al. 2016; Ediz et al. 2017; Moir et al 2018). All this leads to an increase in the prevalence of burnout and mental disorders among medical students (Drolet and Rodgers 2010; Daya and Hearn 2018; Mulyono, et al, 2018).

Objectives

This study aimed to verify the prevalence and dynamics of depression and anxiety of local and foreign students over a 6-year period of study at a medical institute, to develop recommendations for prevention and improve socio-psychological adaptation to educational stress.

Methodology

A continuous sample of 1045 medical students from 1 to 6 year of education was examined: 724 local (Russian) – 187 (25.8%) male and 537 (74.2%) female, and 331 foreign (India) – 248 (80%) male and 73 (20%) female. The medical sociological research method and the psychometric method were used (DASS-21 test for the diagnosis of depression, anxiety and stress). Statistical processing of the database was carried out using nonparametric statistics via the Statistica 6.0 software.

Results and Discussion

Verification of the prevalence, severity, and gender ratio among local and foreign students showed that depression was more common among local ($\chi^2=13.57$ $p=0.0009$; $OR=1,87$ 95% $CI=1.3-2.6$) than in foreign students, 28.7% and 17.8% of cases respectively. No gender differences were detected. Clinically significant (pronounced and extremely pronounced) depression was detected in local medical students in 7.3% of cases and its subclinical level in 21.4% of cases. With foreign students, respectively, 2.5% had clinical and 15.3% subclinical level.

It should be noted that 3% of Russian students had extremely severe depression, which hampered their mundane activities and academic performance.

A study of the prevalence of depression among Russian and foreign students by year (Table 1) showed that in the 1st year of depression was recorded among 19.2% of Russian students, and in 31% of cases among foreign students (differences are not statistically significant). The largest numbers of Russian students with depression was in the 5th and 6th academic years, 38% and 37.8%, respectively.

Table 1. Dynamics of depression in Russian and foreign medical students by academic year (DASS-21 test)

Severity	1 st year		2 nd year		3 rd year		4 th year		5 th year		6 th year	
	n	%	n	%	n	%	n	%	n	%	n	%
Russian students												
Normal	118	80.8	97	78.8	103	71.0	66	72.5	85	62.0	51	62.2
Mild	16	11.0	7	5.7	21	14.5	8	8.8	14	10.2	9	11.0
Moderate	6	4.1	7	5.7	14	9.7	9	9.9	15	10.9	12	14.6
Severe	4	2.7	6	4.9	5	3.4	6	6.6	20	14.7	4	4.9
Extremely severe	2	1.4	6	4.9	2	1.4	2	2.2	3	2.2	6	7.3
TOTAL	146	100	123	100	145	100	91	100	137	100	82	100
Foreign students												
Normal	58	69.0	37	82.2	33	89.2	40	83.3	38	80.8	57	95.0
Mild	10	11.9	3	6.7	2	5.4	5	10.4	5	10.6	2	3.3
Moderate	14	16.7	5	11.1	1	2.7	2	4.2	2	4.3	1	1.7
Severe	2	2.4	0	0.0	1	2.7	1	2.1	2	4.3	–	–
TOTAL	84	100	45	100	37	100	48	100	47	100	60	100

In Russian first- and second-year students, such indicators can be associated with high levels of educational stress, heavy academic load, and a change in the usual pattern of study. The subsequent increase in the frequency of depression in the 3rd and 4th years is due to the beginning of training at the clinics, the need for communication with and clinical examination of patients, and in the 5th and 6th years it can be due to the uncertainty of the future, the problem of finding a job, upcoming graduation exams, accreditation and work as a general practitioner.

The largest number of foreign students with depression (31%) was observed in the 1st year with a decrease in the 2nd and, to a minimum, in the 3rd (10.8%), followed by a slight increase in the 4th and 5th years. It is indicative that foreign students of the 1st and 2nd year had rather high prevalence rates of the clinical level of depression: 19.1% and 11.1%, respectively, with a decrease to 5.4% in the 3rd year and slightly higher by 4th and 5th to over 10%.

A study of the clinical level of depression (severe + extremely severe) showed that in the 1st year it was detected equally often among foreign and local students. Further, Russian students showed a variation in the prevalence of depression to 9.8% in the 2nd year and 4.8% in the 3rd year, after which there was a gradual increase to a maximum (16.9%) by the 5th year. Among foreign students, the incidence of clinically pronounced depression remained approximately the same throughout the 5 years of study, with a decrease to a minimum of 6th

year. By that time, the differences between Russian and foreign students became statistically significant ($\chi^2=6.1$ p=0.014).

Verification of the comorbidity of depression and anxiety showed that in Russian students ($\chi^2=8.86$ p=0.003; OR=3.1 95% CI=1.4-7.0) depression was combined with anxiety in 125 cases (60.1%), and among foreign students in 47 cases (82.5%). Correlation analysis revealed an average level of correlation between depression and anxiety in both Russian (r=0.528 p=0.000) and foreign (r=0.679 p=0.000) students.

A study of the prevalence of anxiety (DASS-21 test) in total showed that anxiety was equally common among Russian and foreign students: 248 (34.3%) and 109 (34%) people, respectively.

Besides, among Russian students, anxiety ($\chi^2=7.7$ p=0.006; OR=1.7 95% CI=1.2-2.5) was more common among women, 200 (37.2%) cases, than men, 47 (25.7%). Thus, it was found that, one third of medical students show increased anxiety, and its clinical level was also observed equally often, in 73 (10.1%) Russian and 31 (9.6%) foreign students.

Comparison of the prevalence of anxiety by year (Table 2) showed that among foreign 1st year students anxiety was more common ($\chi^2=5.5$ p=0.019; OR=2.0 95% CI=1.1-3.6), 48.8% of cases, than among Russian students, 32.2% of cases. This was due to the synergy of migratory and educational stress.

Table 2. Distribution of anxiety among Russian-speaking and foreign medical students by severity in dynamics over a 6-year training period (DASS-21 test)

Severity	1 st year		2 nd year		3 rd year		4 th year		5 th year		6 th year	
	n	%	n	%	n	%	n	%	n	%	n	%
Russian students												
Normal	99	67.8	80	65.0	109	75.2	56	61.5	76	55.5	56	68.3
Mild	15	10.3	23	18.7	18	12.4	12	13.2	31	22.6	8	9.8
Moderate	18	12.3	9	7.3	10	6.9	11	12.1	13	9.5	7	8.5
Severe	6	4.1	6	4.9	5	3.4	3	3.3	5	3.6	4	4.9
Extremely severe	8	5.5	5	4.1	3	2.1	9	9.9	12	8.8	7	8.5
TOTAL	146	100.0	123	100	145	100	91	100.0	137	100.0	82	100.0
Foreign students												
Normal	43	51.2	29	64.5	24	64.9	32	66.7	29	61.7	55	91.6
Mild	15	17.9	8	17.8	4	10.8	11	22.9	13	27.6	4	6.7
Moderate	10	11.9	5	11.1	5	13.5	1	2.0	2	4.3	–	–
Severe	6	7.1	2	4.4	2	5.4	1	2.0	3	6.4	1	1.7
Extremely severe	10	11.9	1	2.2	2	5.4	3	6.4	–	–	–	–
TOTAL	84	100	45	100	37	100	48	100	47	100	60	100

The highest frequency of anxiety among local students was revealed in the 5th year where it was recorded in almost 45% of cases.

The largest number of foreign students with anxiety was registered in the 1st year, 48.8% of cases. In the 2nd year, a decrease in the anxiety frequency to 35.6% (differences are not statistically significant) was noted with a stable value within 33-36% in 2nd-5th years and a steep decrease in the 6th year. Compared to the 5th year, this difference is statistically significant ($\chi^2=12.269$ $p<0.001$; OR=6.8 95% CI=2.1-23.6).

Foreign students showed a distinct reduction in anxiety from 19.0% in the 1st year to 6.6% in the 2nd year. Third-year students showed a slight (statistically insignificant) increase to 10.8% (due to training in clinical departments where they are supposed to communicate with patients despite poor mastery of the Russian language) and a subsequent decrease to 6-8% by the 4th and 5th years. Good educational adaptation and a decent proficiency of the Russian language they obtained by the 4th year helped them reduce the anxiety associated with educational stress. The clinical level of anxiety in foreign sixth-year students was very rare, only 1.7% of cases.

The prevalence of clinically pronounced anxiety among foreign students decreased throughout the entire period of study. A slight increase in the 3rd year was due to the first contact of foreign students, whose fluency in Russian was poor, with Russian-speaking patients in such disciplines as "Propaedeutic of internal diseases", "General care for surgical patients", "General surgery".

Comparison of the dynamics of the clinical level of anxiety showed that by the 2nd year of study the prevalence of anxiety became the same, between the 3rd and the 5th years it slightly fluctuated, and in the 6th year it significantly prevailed ($\chi^2=4.8$ $p=0.0295$; OR=9.1 95% CI=1.7-197.5) among Russian students, 13.4% of cases vs. 1.7% among foreign students. The probability of developing anxiety by the 6th year in Russian students is 9 times greater than that of foreign students.

Verification of the comorbidity of anxiety and depression showed that in Russian students anxiety was combined with depression in 125 (50.4%), and in foreign in 47 (43.1%) cases. The differences are not statistically significant. Correlation analysis revealed an average level of correlation between anxiety and depression both in Russian ($r=0.528$ $p=0.000$) and in foreign ($r=0.679$ $p=0.000$) students.

Russian students experienced distress more often ($\chi^2=10.155$ $p=0.002$; OR=1.6 95% CI=1.2-2.2) than foreign, respectively 34.5% and 17.5% of cases. This is due to the more

pragmatic attitude of the latter towards study and the lack of desire for high academic performance and, herewith, scholarship. It is to be noted that while there were no gender differences in the number of students experiencing distress among the foreign students (it was observed in 17.3% of males and 17.8% of females), it was experienced by 38.6% of females and 23% of males among Russian students ($\chi^2=14.161$ $p=0.0008$; OR=2.1 95% CI=1.4-3.1).

In the first three years of study, distress was observed in one third of Russian medical students (31.5% - 33.9%). In the 4th and 5th years, there was a slight increase in the frequency of stress to 38.5%, followed by a decrease in graduates to 32.9%.

Among foreign students, first-year students experienced the greatest stress, in 29.2% of cases, with a decrease to 15.6% by the 2nd and 10.8% in the 3rd year, a slight increase to 18.6% in the 4th and stabilization by 17.2% in the 5th and 6th years. The dynamics of the general level of stress among foreign students correlated with the dynamics of the subclinical level of depression ($r=0.900$ $p=0.037$).

The clinical level of distress was more common among Russian than foreign students. The smallest prevalence of distress among local students was in the 1st year, with an increase and stabilization at 11-12% of cases in the 2nd-4th years. An increase in the 5th year is due to changes in the organization of postgraduate training for doctors, and the need to pass accreditation and work as a general practitioner after graduation. For international students, the peak of the prevalence of distress falls on the 4th year, when they begin to systematically communicate with Russian patients and study in Russian.

As for the causes of distress, for Russian students the most difficult was adaptation to the unusual mode of study in the 1st year, and for foreign students it was incomprehensible textbooks and the need to compensate for the classes they had skipped (missing classes is one of the main ways of "recreation" and reducing emotional stress for foreign medical students). By the 2nd year, for both groups, a high academic load comes to the fore. In the 3rd year, among Russian students, the leading problem was personal characteristics, shyness, along with a high academic load. For foreigners, the high academic load remained the most significant factor. In the 4th year, for Russian-speaking students, the high academic load and domestic problems were significant, and for foreign students it was the complexity and intensity of the educational process and everyday problems, as well as disappointment in the profession. For Russian fifth-year students the high academic

load, disappointment in the profession and everyday problems have traditionally been of importance, and for foreign students it was uncertainty about the future and the difficulty of study. In the 6th year, high academic load, personal problems and disappointment in the profession come first among Russian students. Personal problems, as well as the tension and complexity of study, played a significant stressful role in connection with the approaching graduation for foreign students.

In order to increase the level of socio-psychological adaptation of students, it is advisable to monitor their psychosomatic status. They need training in proper time planning (preparation for classes, leisure, hobbies), the specificity of preparation for various disciplines, the search for necessary information in the library and on the Web. It is important to inform students about the symptoms of educational stress, the signs of psychological maladaptation and the provision of advisory psychosocial and psychotherapeutic aid in the students' clinic.

Conclusion

Depression was more common ($\chi^2=13.57$ $p=0.0009$; OR=1.87 95% CI=1.3-2.6) among Russian (28.7%) than foreign students (17.8%). Anxiety was equally common among Russian (34.3%) and foreign (34%) students. Moreover, among Russian students, anxiety was more often detected ($\chi^2=7.7$ $p=0.006$) among females, 37.2% of cases, than among males, 25.7%. Russian students experienced distress more often ($\chi^2=10.155$ $p=0.002$; OR=1.6 95% CI=1.2-2.2) than foreign students, respectively 34.5% and 17.5% of cases. This is due to the more pragmatic attitude of the latter towards study and the lack of desire for high academic performance and, herewith, scholarship.

Among foreign students, the highest prevalence of depression, anxiety and distress was in the 1st year (change of residence, the need to adapt to new conditions). Among Russians it was more common in the 5th and 6th years (uncertain future, the problem of finding a job).

Depression is more often ($\chi^2=8.86$ $p=0.003$) combined with anxiety in foreign students (82.5% of cases) than in Russians (60.1%). The average level of correlation dependence of depression and anxiety was revealed for both Russian ($r=0.528$ $p=0.000$) and foreign ($r=0.679$ $p=0.000$) students.

Prevention of socio-psychological maladaptation requires the development of a stress management program, providing consultative psychological and psychotherapeutic assistance in the students' clinic.

Recommendations

It is suggested that this study should be conducted on non-medical students in order to comprehensively address the subject of this study in its various dimensions.

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