

Changes in the Anxiety of Moscow Students during the COVID-19 Pandemic

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ABSTRACT

This work is devoted to assessing the changes in anxiety among Moscow students during the COVID-2019 pandemic. The material was collected in comprehensive examination of 18–25-year-old students studying at Lomonosov Moscow State University (residents of Moscow and the Moscow region). The study included longitudinal and cross-sectional components. The methodology included a social questionnaire about the peculiarities of the self-isolation regime, living conditions of the respondent, professional employment, etc. and the scale of situational and personal anxiety of C.D. Spielberger in the Russian-language adaptation of Yu.L. Khanin. A total of 284 questionnaires have been analyzed. In 2020, two consecutive waves of infection were recorded in Russia: in May and in December. During the first wave, severe social restrictions and a temporary lockdown were introduced in Moscow, and the second one took place under conditions of significantly less restrictions, although it was marked by a large number of infections. Different social load and adaptation to the pandemic led to the fact that the behavioral manifestations of stress and the level of situational anxiety among Moscow students increased significantly at the beginning of the pandemic, but subsequently began to decrease. It can be concluded that among university students there is a social and psychological adaptation to new norms of life, which are dictated by the conditions of the COVID-19 pandemic.

Key words: COVID-2019, pandemic, anxiety, stress, Spielberger-Khanin test, self-isolation, longitudinal studies, students

Introduction

Throughout its history, humanity has repeatedly faced epidemics of various magnitudes, but the pandemic of the new coronavirus infection SARS-CoV-2 has become a global crisis that has challenged not only national healthcare systems, but almost all social and political institutions worldwide.

According to the World Health Organization, Russia ranks fourth among all countries of the world by the number of cases of COVID-19 infection (by 16.03.2021)¹. At the same time, according to the official statistics of the Ministry of Health of the Russian Federation (by 17.03.2021), Moscow and the Moscow region account for more than 27% of all cases². Thus, the impact of coronavirus infection on residents of Moscow and the Moscow region from the appearance of the first cases of infection to the present is very large.

The stressful impact of the pandemic on the psychological wellbeing and health of the population consists of sev-

eral components. The first component is negative conditions directly related to the possibility of getting an infection – fear of the unknown, various hypochondriac disorders, information fear, worries about the health of friends and close relatives, etc.^{3,4} The second component is stress caused by restrictive measures (social distancing, isolation and quarantine), which are taken to prevent the spread of infection.^{5,6} Additional psychological pressure occurs due to concern for economic well-being, which is caused by the global economic crisis, manifested at the individual, national and global levels.^{7,8} As a result, in areas with high percentage of infections where severe restrictive measures have been introduced, the negative impact of the pandemic significantly affects the psychological state of the population, in particular, increasing the level of anxiety.

According to various studies, young people aged 18–30 years are one of the most psychologically vulnerable groups^{9–11}. At the same time, the main stress load occurs due to fear of economic crisis consequences¹², as well as

a change in lifestyle caused by restrictive measures and the transition to distance learning (for students).^{13,14}

The study of the consequences of the pandemic and social isolation on the psychological state and health of students is a topical line of investigation. At the same time, most studies of this problem in Russia are based on cross-sectional surveys, which made possible to assess the psychological parameters only directly during the height or weakening of the pandemic. Longitudinal studies, especially those affecting the period before the pandemic, will give an opportunity to more accurate assessment of the degree of influence of COVID-19 on the psychological state of students.

The aim of this study was to assess the changes in anxiety level among students during the year that has passed since the beginning of the spread of SARS-CoV-2 in Russia.

Material and Methods

The material for this study includes the data collected during several stages of a comprehensive survey of students in the Lomonosov Moscow State University. The first group (I group) of the surveyed was recruited in March 2020. The respondents were tested offline on the basis of the Department of Anthropology in the Faculty of Biology of the Lomonosov Moscow State University from 2nd to 16th of March 2020. This group was examined again for the first time on the 25th–30th of May 2020 and for the second time from September to November 2020. II and III groups were examined once in September–November 2020 and on the 15th–27th of February 2021 accordingly. The design of the study is shown in Figure 1. Since May 2020, all surveys were conducted online on the Google Forms platform. The final sample included respondents aged 18 to 25 years who lived in Moscow or the Moscow region during the survey period. The size of the total sample and the number of surveyed groups are shown in Table 1.

TABLE 1
THE NUMBER OF SURVEYED GROUPS AND EXAMINED SUBJECTS

Group		Males	Females	Total
I group	Before pandemic	22	54	76
	1 st re-exam.	11	28	39
	2 nd re-exam.	9	26	35
II group		20	87	107
III group		3	24	27

The survey program consisted of two parts and included:

1. A social questionnaire consisting of 15 questions about the details of observing the self-isolation regime, the respondent's living conditions, professional employment, etc.
2. The scale of situational and personal anxiety of C.D. Spielberger in the Russian-language adaptation by Yu.L. Khanin¹⁵. This questionnaire is considered as one of the most effective tools for the differential determination of anxiety as a personality trait (personal anxiety) and as a state that occurs in response to certain situations (situational anxiety)¹⁶.

The collection of data was carried out with the signing of consent protocols, subsequently the data were depersonalized. The study was approved by the local committee on bioethics of the Faculty of Biology, Lomonosov Moscow State University (protocol 112-d dated 13.04.2020).

Statistics

Statistical processing of data was carried out in the program Statistica 10.0 and MS Excel. To determine the reliability of differences between the mean values of anxiety indicators before and after the introduction of preven-

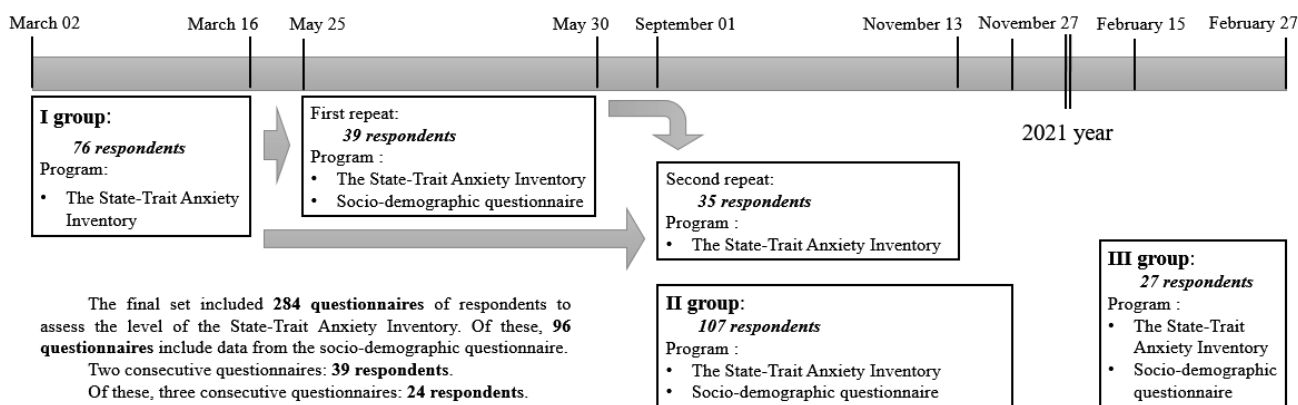


Fig. 1. Design of the longitudinal and cross-sectional parts of the study.

tive measures, the Tukey Test for dependent samples (Tukey's honestly significant difference test, HSD) was used, and the Fisher F-test (ANOVA F-test) was used for comparisons between several groups. The significance level is $p < 0.05$.

Results

Table 2 shows some results of the socio-demographic questionnaire in the three surveyed groups. It should be noted that there were no sexual differences in the studied characteristics, so the data for both sexes were combined due to the small sample size.

Table 3 shows the results of the longitudinal and cross-sectional parts of the study of anxiety indicators during one year of the pandemic. The longitudinal part included three consequent examinations of the I group: before the announcement of the pandemic, during the first (May 2020) and second (October 2020) waves. The cross-sectional part included three groups: before the announcement of the pandemic (I group, March 2020), during the second wave (II group, October 2020) and after the weakening of the second wave (III group, February 2021).

Additionally, we calculated the differences in indicators of personal and situational anxiety between boys and girls in each of the surveyed group. According to the indicators of situational anxiety, there were no significant differences between the sexes. The average level of person-

al anxiety in the female group is higher, but these intersex differences in average values are statistically not significant. The changes in anxiety indicators over time turn out to be the same in boys and girls.

Discussion and Conclusions

Compliance with the self-isolation regime

During the year of this study the situation with the prevalence of coronavirus infection and related restrictive measures introduced in Russia and Moscow changed significantly. The I group was examined for the first time before the introduction of restrictive measures at the Lomonosov Moscow State University¹⁷ and it ended five days after the WHO announcement of the COVID-19 pandemic.¹⁸ The morbidity level in Russia and Moscow remained very low during this period. It can be assumed that the first part of the survey took place in the absence of an additional stress factor associated with the spread of SARS-CoV-2. The first re-examination of the I group took place on the 25th–30th of May 2020, when the maximum number of new infections was recorded in Moscow^{19,20}, a severe restrictive regime was introduced in all regions of the country, a complete lockdown was announced over the past two months. The stress associated with the social and economic consequences of the spread of infection was maximum.

TABLE 2
THE RESULTS OF THE SOCIO-DEMOGRAPHIC QUESTIONNAIRE IN THE SURVEYED GROUPS

Survey period		May 2020	September-November 2020	February 2021
The size of the surveyed group		41	28	27
Compliance with the self-isolation regime	Strict	12.2%	3.6%	7.4%
	With violation	26.8%	28.6%	22.2%
	Non-compliance	60.9%	67.9%	70.4%
Suspicion of the presence of COVID-19 during the survey period	No	87.8%	92.9%	77.8%
	Yes	12.2%	7.1%	22.2%
Relatives or close friends died from COVID-19 during the survey period	No	95.1%	92.9%	85.2%
	Yes	4.9%	7.1%	14.8%
COVID-19 was diagnosed in relatives or close friends during the survey period	No	73.2%	39.3%	11.1%
	Yes	26.8%	60.7%	88.9%
During the self-isolation lived with	Alone	19.5%	14.3%	11.1%
	With close relatives/partners	73.2%	64.3%	81.5%
	In a student dormitory	7.3%	21.4%	7.4%
How many people lived in one apartment/room	0-2	58.5%	64.3%	40.7%
	3-4	24.4%	28.6%	48.1%
	>4	17.1%	7.1%	11.1%

TABLE 3
CHANGES IN THE PARAMETERS OF SITUATIONAL AND PERSONAL ANXIETY IN GROUPS I-III OF MOSCOW STUDENTS

Longitudinal part of the survey									
	Mean	N	St. Dev.	Q25	Median	Q75	Tukey HSD test		
Personal anxiety							{1}	{2}	{3}
F=0.487; p=0.6151									
Before pandemic {1}	45.6	76	10.33	38.5	46.5	52.0	-	0.927	0.740
First wave {2}	44.9	41	10.26	36.0	45.0	51.0	0.927	-	0.596
Second wave {3}	47.2	35	10.19	39.0	45.0	57.0	0.740	0.596	-
Situational anxiety									
F=6.656; p=0.0017							{1}	{2}	{3}
Before pandemic {1}	38.3	76	9.47	31.0	37.0	44.0	-	0.001	0.407
First wave {2}	45.6	41	12.06	39.0	45.0	55.0	0.001	-	0.129
Second wave {3}	41.0	35	9.95	35.0	41.0	46.0	0.407	0.129	-
Cross-sectional part of study									
	Mean	N	St. Dev.	Q25	Median	Q75	Tukey HSD test		
Personal anxiety							{1}	{2}	{3}
F=2.357; p=0.0972									
Before pandemic {1}	45.6	76	10.33	38.5	46.5	52.0	-	0.095	0.344
Second wave {2}	49.0	107	11.47	40.0	50.0	58.0	0.095	-	1.000
After second wave {3}	49.0	27	10.42	39.0	51.0	57.0	0.344	1.000	-
Situational anxiety									
F=9.477; p=0.0001							{1}	{2}	{3}
Before pandemic {1}	38.3	76	9.47	31.0	37.0	44.0	-	0.000	0.240
Second wave {2}	45.5	107	11.98	36.0	46.0	54.0	0.000	-	0.366
After second wave {3}	42.3	27	10.72	34.0	43.0	49.0	0.240	0.366	-

The second re-examination and the formation of the II group of respondents took place in the autumn of 2020, when the "second wave" of the spread of coronavirus was observed worldwide and in Russia as well. A significant epidemiological burden is reflected in the results of our survey – in the second period of the study, the number of cases of suspected coronavirus infection, sicknesses or deaths from COVID-19 among close relatives and friends increased significantly compared to the first period (Table 2). Despite this, no significant restrictive measures were introduced, learning at the universities continued online. Therefore, against the background of the maximum level of morbidity and mortality from SARS-CoV-2 for the whole year, the level of social stress in Moscow was at an average level, perhaps even lower than in May of the same year. This fact indirectly reflects a low level of compliance with the self-isolation regime in these groups.

The III group was formed in the first half of February 2021. The incidence rate in Moscow and in Russia fell after the second wave, new cases were recorded approximately 60% less than the average level of those in autumn 2020. Social restrictive measures were not introduced on

the territory of Moscow and the Moscow region, classes at universities partially switched to offline format. In this regard, the additional stress load can be assessed as small, returning to the level before the start of the pandemic.

Table 2 shows that the patterns of compliance with the self-isolation regime vary greatly during the year and the strictness of compliance with the measures decreases significantly during this period. It is important to note that more than 60% of respondents stated that they did not follow or followed with significant violations the mandatory self-isolation regime even during the period of a significant increase in the epidemiological burden and the threat of an administrative violation for non-compliance with it (up to monetary fines for its violation, according to Article 3.18.1. of the Code of the City of Moscow on Administrative Offenses).

Non-compliance with the regime is naturally associated with an increasing number of social contacts during the year. This reflects a decrease in the number of respondents who lived alone and an increase in the average number of people living together in the same apartment. These results reflect the previously described trend of the weak-

ening of social tension caused by the pandemic and the reduction of stress load in the period from May 2020 to February 2021.

Variability of personal anxiety during the year of the pandemic

A longitudinal study of personal anxiety indicators did not reveal significant changes during the six months period (Table 3). There were no differences in this indicator when comparing three cross-sectional surveys of Moscow students. This corresponds to expectations, since this type of anxiety is a stable personal characteristic^{21,22}. At the same time, the level of personal anxiety can determine a person's tendency to assess various situations as dangerous and threatening. It was shown that during the SARS outbreak in Hong Kong in 2002-2004, a high level of personal anxiety was a risk factor for the development of anxiety conditions associated with SARS²³. Despite this, the level of personal anxiety among Moscow students did not determine the behavior aimed at reducing the risks of contracting the SARS-CoV-2 virus in conditions of its active spread. Thus, there were no significant differences in the degree of personal anxiety in groups that differ in the degree of self-isolation and the number of people living together with the respondent.

Changes in situational anxiety during the year of the pandemic

The dynamics of situational anxiety in the surveyed groups of young Muscovites is directly related to the development of the level of social stress. A comparison of data collected before the pandemic and in May 2020, during the first peak of morbidity, shows that the average value of this indicator has shifted from the range of values corresponding to a moderate level of anxiety to a high level range. These differences are statistically significant (Table 3). These results agree with numerous studies that found an increase in the level of anxiety during the COVID-19 pandemic in different population groups^{9,24,25}, and in student samples^{26–28}. As it was described earlier, the most severe restrictive measures were introduced during this period, the society experienced a high stress load due to the fear of spreading infection.

It should be taken into account that the stress directly related to the pandemic was not the only negative factor affecting the psychological state of Muscovites during this period. Already in the first months of serious social restrictions, it became clear that they would lead to significant economic consequences and could worsen the standard of living of the population. An additional stressful

factor for students was the State final certification (final exams and final qualifying works) in May-June 2020. As additional studies have shown, the stress from exams was combined with other stressors, which led to an even greater increase in situational anxiety in students²⁹.

During the second re-examination, in the second wave of the pandemic in September-November 2020, we can see a decrease in the level of situational anxiety among students and its approximation to the values observed before the start of the pandemic (Table 3). The decrease in this indicator reflects the general mood of Moscow society and the level of social burden caused by restrictions. It can be noted that the economic situation has largely stabilized, and the absence of active restrictions and lockdown led to a reduction in stress, despite the high level of morbidity and mortality in the capital region. A decrease in situational anxiety can be considered as an indicator of gradual psychological adaptation to the emerging norm of life in the conditions of the COVID-19 pandemic. This effect of psychological adaptation has already been previously shown in longitudinal studies³⁰, but in terms of the level of anxiety, it was studied for the first time in this research.

The results of a cross-sectional survey of the three groups of students during the year of the pandemic confirm this conclusion. In the II group, examined in the fall of 2020, the level of anxiety was still significantly higher than in control group studied before the pandemic. And in the III group, which was tested in February 2021, this indicator became lower, and already did not differ statistically from the control (Table 3).

Within a year after the coronavirus infection in Russia widespread, two consecutive waves of infection were recorded. And if in the first wave, which occurred in May 2020, severe social restrictions and a temporary lockdown were introduced, then the second wave took place under much less restrictions, although at that time a greater number of infections were recorded. The different social load and adaptation to the pandemic led to the fact that behavioral manifestations of stress and the level of situational anxiety among Moscow students increased significantly during the first period of the pandemic, but later began to decrease. It can be concluded that among the university students, there is a social and psychological adaptation to the new standards of life, which are dictated by the conditions of the COVID-19 pandemic.

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PROMJENE U ANKSIOZNOSTI MOSKOVSKIH STUDENATA TIJEKOM PANDEMIJE COVID-19

SAŽETAK

Ovaj rad je posvećen procjeni promjena u anksioznosti među moskovskim studentima tijekom pandemije COVID-2019. Podaci su prikupljeni u sveobuhvatnom ispitivanju studenata od 18 do 25 godina koji studiraju na Moskovskom državnom sveučilištu Lomonosov (stanovnici Moskve i Moskovske regije). Studija je uključivala longitudinalne i poprečne komponente. Metodologija se temeljila na upitniku o osobitostima režima samoizolacije, životnim uvjetima ispitanika, profesionalnom zapošljavanju i sl. te skali situacijske i osobne anksioznosti C.D. Spielberger u adaptaciji na ruskom jeziku. Ukupno je analizirano 286 upitnika. U Rusiji su 2020. zabilježena dva uzastopna vala zaraze: u svibnju i prosincu. Tijekom prvog vala u Moskvi su uvedena stroga socijalna ograničenja i privremena karantena, a drugi se odvijao u uvjetima znatno manjih ograničenja, iako je obilježen velikim brojem zaraza. Različito društveno opterećenje i prilagodba na pandemiju doveli su do toga da su se bihevioralne manifestacije stresa i razina situacijske anksioznosti među moskovskim studentima značajno povećale na početku pandemije, ali su se kasnije počele smanjivati. Može se zaključiti da među studentima postoji socijalna i psihološka prilagodba novim životnim normama koje diktiraju uvjeti pandemije COVID-19.