



Research article

YOUNG STUDENTS' LIFESTYLE AS A HEALTH RISK FACTOR DURING THE COVID-19 PANDEMIC UNDER VARIOUS ANTI-EPIDEMIC STRATEGIES

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Various strategies have been implemented to prevent the COVID-19 spread both in Russia (self-isolation) and in Belarus (restrictive measures). They can be considered an unordinary stress-inducing situation that involves drastic changes in a lifestyle.

Our research goal was to analyze students' attitudes towards basic lifestyle components in both countries under various anti-epidemic strategies.

We interviewed 876 students from Krasnoyarsk who were self-isolated for 2.5 months and 1140 students from Grodno who did not face strict quarantine restrictions. We performed comparative assessment of changes in basic lifestyle components that occurred during the pandemic.

We established certain changes in subjective health self-assessment (more than a half of the students described it as bad), emotional state (subjective comfort index was between its acceptable level and a trend towards its deterioration). Acute deficiency of usual physical activity was mentioned by 35.4 % of the respondents from Krasnoyarsk and 29.5 % of their counterparts from Grodno ($p < 0.01$). Twenty-three point nine percent of the students from Grodno and 26.6 % from Krasnoyarsk gave up adhering to healthy sleep and nutrition regimes and this resulted in uncontrollable growth in body mass. The complex index of positive changes in a lifestyle, its maximum being seven scores, amounted to 4.15 ± 1.56 scores among the respondents in Krasnoyarsk against 4.46 ± 1.48 scores in the reference group ($p < 0.01$). Some respondents resorted to taking psychoactive substances in their search for subjective stability. Seven point seven percent of the students in Grodno and 4.8 % of their counterparts in Krasnoyarsk started smoking during that period; 28.9 % and 46.2 % of the respondents accordingly increased frequency and volumes of alcohol consumption ($p < 0.01$).

Therefore, the present study concentrated on analyzing specific attitudes towards lifestyles among students in two countries under various anti-epidemic strategies. The results provide significant information for both public healthcare organizations and educational establishments since they can be used as grounds for suggesting activities aimed at maintaining students' wellbeing and providing wider opportunities for young people to pursue a healthy lifestyle.

Keywords: *lifestyle, physical health, mental health, students from universities in Russia, students from universities in Belarus, COVID-19 pandemic, lockdown, anti-epidemic strategies.*

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In an extreme situation, when many restrictive measures have become a part of everyday life, it is especially vital to examine attitudes towards lifestyle and its components [1, 2]. The new COVID-19 coronavirus infection pandemic can be considered a good example here [3] since it has already influenced people's attitudes towards basic components in their lifestyles (physical activity, body tempering, daily routines, nutrition, and refusal to take any psychoactive substances) and is still affecting them [4, 5]. Available research results indicate that anti-epidemic measures vary from country to country; still, basic actions are quite similar and are primarily aimed at producing effects on classical components in any epidemic process. They should influence a source of an infection, block ways of its spread, and raise population resistance to it through creating and enhancing immunity [6–8]. There are ongoing discussions about advisability of different restrictive or permissive measures taken in various countries as a response to the COVID-19 spread. Some people believe that strict measures are not justified [9, 10]; the others argue in favor of extreme restrictive quarantine-like actions [11]. Each country chooses its own way to fight against the pandemic and undergoes an unique “natural experiment” created by the COVID-19 spread [12, 13]. Quarantine measures to fight against the infection were instantly introduced in Russia and in most European countries just as the first pandemic wave started. As opposed to most countries, Belarus refused from introducing strict quarantine measures from the very beginning of the pandemic and the society's lifestyle was preserved in the republic without any grave restrictions or panic. The country did not impose complete or partial limitations on social contacts and people were solely informed about necessary safety precautions and were asked to adhere to them [14–16]. In Russia, self-isolation became a major issue since it led to drastic changes in lifestyle [2]; it is considered an independent stress-factor that impairs people's physical and mental health [17].

Effects produced by pandemic restrictions on lifestyle and its components (self-isolation

was introduced several times in 2020 in Russia) can be examined by comparing attitudes of people from two closely related cultures (students in Belarus and Russia) who have quite much in common regarding their lifestyles and culturological components as well as speak the same language. Students are a social group that adapts to new conditions rapidly and easily; therefore, they are an interesting contingent for a comparative study [5].

A freedom to move around and physical activity in general decreased dramatically when strict anti-epidemic restrictions were introduced [18]. The coronavirus pandemic made students and lecturers in Russian higher education institutions switch to distance learning while in Belarus hybrid learning was introduced (conventional learning combined with partial use of information and communication technologies when necessary). Learning became more intense due to arising difficulties in mastering new technologies, requirements not being defined clearly, technical capacities related to distance learning, and impaired activity of the body functional systems. All this created risks of psychosomatic disorders [19]. Since we had necessary data provided by students from both countries regarding various aspects of their lifestyles and their physical and mental health, we were able to perform comparative analysis of two statistical samplings. The analysis completed, we attempted to estimate peculiarities of physical activity, compliance with self-isolation, adherence to healthy wake and sleep regime as well as keeping healthy diets, bad habits, and general health during the COVID-19 pandemic under different anti-epidemic strategies adopted in two countries to prevent the infection spread.

Our research goal was to analyze students' attitudes towards basic lifestyle components in both countries under various anti-epidemic strategies; our respondents were students from Belarus (Grodno) and Russia (Krasnoyarsk).

Research materials and techniques. Our respondents were full-time students of the 2nd–4th year in medical and pedagogical

higher education institutions in Grodno and Krasnoyarsk. Overall, 2016 people took part in the study; future teachers accounted for 64.1 %, and future doctors, for 35.9 %. These specialties were selected due to future occupations with their certain peculiarities associated with the necessity to work with people, rendering assistance in various situations and promoting healthy lifestyle by personal example.

Another reason that makes this study vital is associated with estimating anti-epidemic strategies adopted in Belarus and Russian to fight the infection spread since they determine students' lifestyle. The study took place when the pandemic was at its peak and the anti-epidemic strategies adopted at that moment in two countries differed significantly. In Russia, the total lockdown was introduced at the federal level. Anti-COVID-19 measures were introduced by the Order of the RF Chief Sanitary Inspector No. 15, IV, issued on May 22, 2020. The Order stipulated strict self-isolation at a local level, quarantine measures were implemented, and students switched to distance learning. Simultaneously, preventive activities aimed at hygienic education became more intense both during lectures and beyond them (for example, hygienic tests, online exhibitions of posters and healthy lifestyle contests). A lot of attention was paid to improving mental health (online consultations provided by a psychologist); senior students and supervisors volunteered to help junior students to adapt to this unusual situation. In Belarus, life was organized in the same way and the society did not have to face drastic changes; still, certain restrictions were implemented ("The methodical guidelines on organizing educational processes in education institutions during the COVID-19 spread"). Nevertheless, these two different approaches adopted both in Russia and Belarus can be considered an unordinary stress-inducing situation for population [20], young students included.

Our study relied on a specifically designed questionnaire that included questions aimed at detecting changes in students' lifestyle and its components, in particular, their

physical activity, diet, wake and sleep regime, as well as use of psychoactive substances. The study was accomplished online at the end of 2020 when all the participating students had already gained certain experience in living under new conditions. An online survey is an optimal way to get information; it gives an opportunity to obtain primary data in a short time under restrictions at the height of the pandemic [7]. Prior to the research, all the respondents were informed about its goals and methodology as well as it being anonymous and confidential. An access to the online questionnaire, which was located on Google Forms, was granted to a respondent only after he or she gave its clear consent to take part in the study.

We questioned two groups of students. The first one was made of students attending higher education institutions in Krasnoyarsk, Russia ($n = 876$; an average age was 20.7 ± 1.64 years; 16 % males, 84 % females). These students were self-isolated from March to June 2020 during the pandemic and had to switch to distance learning. The second group included students from Grodno in Belarus ($n = 1140$; an average age was 20.4 ± 1.93 years; 20 % males, 80 % females) who had to face certain restrictions without strict quarantine measures.

Female students prevailed in these two student samplings due to specificity of medical and especially pedagogical higher education institutions. Table 1 provides data on how respondents were distributed depending on their chosen occupation and sex.

All the data were statistically analyzed with Statistica 13 PL software package. Data analysis involved calculating absolute and relative frequencies and using descriptive statistics techniques. Prior to analyzing quantitative indicators, we estimated whether the analyzed values complied with the normal distribution law for a variational series. This was done with Shapiro – Wilk test. Given that the data were not distributed normally, we applied non-parametric statistics techniques. Quantitative indicators were given as $\bar{X} \pm \sigma$ (\bar{X} is a simple mean and σ is standard deviation),

Table 1

Respondents' groups considering their future occupation and sex, abs. (%)

Occupation	Grodno ($n = 1140$)		Krasnoyarsk ($n = 876$)		Both cities ($n = 2016$)	
	Males	Females	Males	Females	Males	Females
Total	225 (19.7)	915 (80.3)	140 (16.0)	736 (84.0)	365 (18.1)	1651 (81.9)
Pedagogical	113 (15.5)	618 (84.5)	34 (8.1)	385 (91.9)	147 (12.9)	1003 (87.2)
	731 (64.1)		419 (47.8)		1150 (57.0)	
Medical	112 (27.4)	297 (72.6)	106 (23.2)	351 (76.8)	218 (25.2)	648 (74.8)
	409 (35.9)		457 (52.2)		866 (43.0)	

Me (median) and Q_{25} – Q_{75} (interquartile range). We applied Mann – Whitney *U*-test to assess validity of differences between them. Qualitative indicators were compared using Pearson's chi-squared test (Pearson's χ^2). The critical significance level (*p*) was taken as 0.05 when statistical hypotheses were tested.

The study was accomplished in conformity with all the ethical standards stipulated by the Declaration of Helsinki and the EU Directives (8/609EU). It did not infringe on human rights, did not impose any threats for participants and fully conformed to ethical requirements fixed for biomedical research [21, 22].

Results and discussion. We chose young students as our research object. We estimated how respondents were distributed as per sex and future occupations with χ^2 criterion and established similarities between the groups, that is, they belonged to the same general totality.

Our social survey revealed that when students from both groups had to face either self-isolation or certain restrictions in their everyday life, this resulted in changes in their subjective health self-assessment and emotional state and also led to deficiency of habitual activity. Lifestyles of most respondents apparently deviated from recommended standards regarding such vital components as sleep duration, diet, physical activity, intensity of educational loads, and use of psychoactive substances. Health self-assessment turned out to be negative in more than a half of the cases. The students from Krasnoyarsk complained their health was bad during self-isolation in 54.3 % of the cases. A share of the students from Grodno with negative

health self-assessment was authentically lower (52.8 %). One fifth of the students did not notice any deterioration of their health; 21.8 % of the students from Grodno and 23.5 % of the students from Krasnoyarsk stated their health was either normal or good. Emotional state of most respondents also tended to be unstable due to lack of activity, including physical one. The subjective comfort index that reflects the existing functional state was between its acceptable level and a trend towards its deterioration (50.9 ± 12.4 and 50.8 ± 14.2 scores as per "The scale for subjective comfort assessment by A.B. Leonova" [23] in both examined groups).

While being either self-isolated or living under certain restrictions, 1111 (54.8 %) of the respondents changed their attitudes towards their health drastically and made them more rational, 708 (61.6 %) of the students from Grodno and 403 (46.0 %) of their counterparts from Krasnoyarsk accordingly. Lower values obtained for Krasnoyarsk might be due to students not being ready to face such an extreme situation as a complete lockdown.

Self-isolation induced a decrease in physical activity. Three hundred and ten (35.4 %) of the respondents from Krasnoyarsk lost part of their interest in physical exercises. The students from Grodno (the reference group in this study) also had lower physical activity at that period but a decrease was a bit less apparent (mentioned by 336 people or 29.5 %). One fifth of the respondents, trying to find a way out and realizing how important physical activity was for their health, started doing morning exercises and physical training during a day; they also tried to adhere to rational daily regimes and to plan their activities. A number of the respon-

dents from Krasnoyarsk who had morning exercises and physical training during a day grew by 191 people (21.8 %), which was higher than a number of their counterparts from Grodno who did the same, 188 people (16.5 %). A number of the respondents who tried to plan their daily routines in an optimal way was practically the same in both groups, 493 (56.3 %) students from Krasnoyarsk and 674 (59.1 %) students from Grodno. A half of the respondents had a shorter sleep than recommended and we did not reveal any statistically significant differences between the groups as per sleep duration.

Although many respondents had positive opinions about changes in their diets and eating habits, most still were unsatisfied with outcomes of these changes. One fourth of the respondents, 273 (23.9 %) students from Grodno and 233 (26.6 %) students from Krasnoyarsk did not keep healthy diets. As a result, such students (especially female ones) often noted that their body mass increased. Six hundred and sixty (57.9 %) students from Grodno and 414 (47.3 %) students from Krasnoyarsk related changes in their lifestyle to searching for stabil-

ity and feeling themselves safe. A small share of the respondents fell back on taking psychoactive substances in their search for subjective stability. Eighty-eight (7.7 %) students from Grodno and 42 (4.8 %) students in Krasnoyarsk started smoking, 38.9 % and 46.2 % of the respondents accordingly mentioned that they started drinking more often and consuming alcohol beverages in greater volumes.

Tables 2 and 3 provide data on frequency of changes in students' lifestyles and deficiency of their habitual activities due to self-isolation or restrictions.

We summed up all the responses as per seven scales that reflected a positive approach and a wish to improve one's lifestyle. As a result, we calculated the complex index of positive changes in lifestyle. It amounted to 4.46 ± 1.48 scores out of maximum seven scores ($Me = 5$, $Q_{25}-Q_{75} = 4-6$) among the respondents from Grodno and to 4.15 ± 1.56 scores ($Me = 4$, $Q_{25}-Q_{75} = 3-5$) among the respondents from Krasnoyarsk (Mann – Whitney test, $Z = 4.7$, $p < 0.001$). A share of students who did not have any changes in their lifestyle did not exceed 1.0 % in either group.

Table 2

Peculiar attitudes towards lifestyle in the examined groups, abs. (%), (95%-confidence interval)

Answer	Grodno (n = 1140)	Krasnoyarsk (n = 876)	Both cities (n = 2016)
I try to keep a certain daily routine	674 (59.1) (56.3–61.9)	493 (56.3) (53.0–59.6)	1167 (57.9) (55.7–60.1)
$\chi^2 = 1.64, p = 0.2$			
I do morning exercises regularly	188 (16.5) (14.3–18.6)	191 (21.8) (19.1–24.5)	379 (18.9) (17.1–20.5)
$\chi^2 = 9.2, p < 0.01$			
No, I do not drink or smoke	696 (61.1) (58.2–63.9)	471 (53.8) (50.5–57.1)	1167 (57.9) (55.7–60.1)
$\chi^2 = 10.8, p < 0.001$			
I walk outdoors	703 (61.7) (58.9–64.5)	450 (51.4) (48.1–54.7)	1153 (57.2) (55.0–59.4)
$\chi^2 = 21.4, p < 0.0001$			
I spend the whole day working on a PC or using a phone	250 (21.9) (19.5–24.3)	319 (36.4) (33.2–39.6)	569 (28.2) (26.3–30.2)
$\chi^2 = 51.3, p < 0.0001$			
I do not keep a healthy diet	273 (23.9) (21.5–26.4)	233 (26.6) (23.7–29.5)	506 (25.1) (23.2–27.0)
$\chi^2 = 1.9, p = 0.1$			
I have started smoking	88 (7.7) (6.2–9.3)	42 (4.8) (3.4–6.2)	130 (6.5) (5.4–7.5)
$\chi^2 = 7.0, p < 0.01$			

Table 3

Deficiency of habitual activities during the period when anti-epidemic measures were in force, abs. (%), (95%-confidence interval)

Answer “I do not have enough...”	Grodno (n = 1140)	Krasnoyarsk (n = 876)	Both cities (n = 2016)
Walking / doing sports outdoors	336 (29.5) (26.8–32.1)	310 (35.4) (32.2–38.6)	646 (32.0) (30.0–34.1)
	$\chi^2 = 7.96, p < 0.01$		
Entertainment, new excitements	556 (48.8) (45.9–51.7)	432 (49.3) (46.0–52.6)	988 (49.0) (46.8–51.2)
	$\chi^2 = 0.06, p = 0.8$		
Communication with teachers, a possibility to discuss something that is difficult to understand	262 (23.0) (20.5–25.4)	428 (48.9) (45.6–52.2)	690 (34.2) (32.2–36.3)
	$\chi^2 = 147.3, p < 0.0001$		
Cultural events (going to museums, theaters, etc.)	494 (43.3) (40.5–46.2)	412 (47.0) (43.7–50.3)	906 (44.9) (42.8–47.1)
	$\chi^2 = 2.74, p = 0.09$		
Socializing with friends / acquaintances	565 (52.1) (46.7–52.5)	520 (59.4) (56.1–62.6)	1085 (53.8) (51.6–56.0)
	$\chi^2 = 19.1, p < 0.001$		
Freedom to move around the city	478 (41.9) (39.1–44.8)	384 (43.8) (40.6–47.1)	862 (42.8) (40.6–44.9)
	$\chi^2 = 0.73, p = 0.39$		
Stability, feeling safe	660 (57.9) (55.0–60.8)	414 (47.3) (43.9–50.6)	1074 (53.3) (51.1–55.5)
	$\chi^2 = 22.5, p < 0.0001$		

The survey results indicate that changes in major lifestyle components that occurred when various restrictions were in force during the pandemic were associated with several factors. These factors were limited freedom to move around, specificity of distance or hybrid learning, limited direct contacts with friends and teachers [8]. These results reflect common trends associated with changes in lifestyle such as more frequent negative health self-assessments and assessments of emotional state, lack of habitual activity, loss of stability, feeling oneself unsafe.

There are certain differences in frequency of changes regarding lifestyle components under different anti-epidemic strategies aimed at fighting the COVID-19 spread. Many authors note that at the first stages in the pandemic students turned out to be disorganized, they were not able to adhere to basic healthy lifestyle [2]. At the same time, some of them adapted their daily routines quite soon and introduced various productive components into them. They, for example, helped relatives do house chores, helped younger siblings do their school homework, wrote research articles, par-

ticipated in online conferences, contests and grants for students by making presentations. Some students even had to find a job so that they could help their family to pay expenses.

It became vital to search for ways to motivate students to keep healthy diets, to do sports or exercises and to adhere to other components of healthy lifestyle. When self-isolated people were unable to do sports or exercises at home or, even able, were not interested in doing them, it could lead to their complete refusal from any physical activity. Meanwhile, physical activity was becoming more and more necessary due to growing stress, on the one hand, and significant amounts of accumulated energy that needed to be spent, on the other hand [24].

Self-isolated students from Krasnoyarsk had limited possibilities to have any physical activity within closed spaces, thereby reducing its volumes and making it much less variable. A situation being uncertain and limitations being only prolonged made students ignore planning and abandon rational daily routines, spend more time playing or working on PC, stick to unhealthy diets and adverse eating

habits, as well as take psychoactive substances “to calm down” (smoking, alcohol or drugs). On the other hand, self-isolation led to a situation when quite a substantial share of students started doing more physical training including regular morning exercises. The existing stressful situation made students concentrate on ways how to get distracted from unpleasant thoughts, finding something positive in life, looking for a possibility to learn something new (distance and hybrid learning). The study [25] revealed that mental withdrawal and emotion-based strategies aimed at coping with the pandemic were rather ineffective since they could enhance psychological stress in students of higher education institutions. However, it is a bit early to estimate effectiveness of these strategies for coping with an emergency without available long-term data. Still, it does not exclude the necessity to develop preventive recommendations on how to preserve physical and mental health and wellbeing [26, 27].

Our research results indicate that actions aimed at optimizing lifestyle during the pandemic were quite similar but their implementation by the students was rather different due to different estimates of the situation itself as well as available opportunities and resources. Different strategies aimed at fighting the coronavirus infection influenced frequencies of changes in basic components of students' lifestyle. The respondents from Grodno more often mentioned they refused to believe in what was happening and this was combined with denying the reality. This might be due to absence of strict restrictions, specific ways to inform population about the epidemiological situation and, consequently, not so drastic changes in usual lifestyle.

Psychoactive “calming” substances were used rather rarely by the respondents with the aim to change lifestyle and achieve at least imaginary stability and safety. Nevertheless, the students from Krasnoyarsk tended to drink alcohol more often; this might be due to looking for a stronger “anti-stress substance”. The students from Grodno started smoking during that period more frequently though. These detected differences can be explained either by

stricter control performed by family or absence of it. Some authors note that family exerts substantial influence on personal behavior and adherence to preventive activities [7]. Unfortunately, even support provided by close relatives or friends was not enough for some students to overcome this difficult situation without resorting to alcohol and smoking.

Conclusions. Self-isolation and restrictions during the pandemic highlighted all the issues related to active searching for new opportunities to improve one's lifestyle. Specific quarantine measures adopted in different countries resulted in different decisions on how to optimize basic components of students' lifestyle.

Students who only had to face certain restrictions and switched to hybrid learning tried to pursue more active lifestyle more frequently, they planned their daily routines and chose to spend their time more actively and reduce periods of working on PC as opposed to their self-isolated counterparts. At the same time, young students who had to face the complete lockdown tried to have more physical activity by doing morning exercises or physical training during a day.

Given the still existing unfavorable epidemiological situation, this study can be used to develop recommendations for students to help them survive self-isolation in the most optimal way. Besides lifestyle peculiarities that are typical for students (unbalanced diets, sleep deprivation, and use of psychoactive substances), attention should be paid to specific ones that occur during self-isolation (a substantial decrease in physical activity, changes in educational loads, and limited social contacts).

The results provide data that are important for both public healthcare organizations and education institutions since they can help develop useful recommendations aimed at maintaining students' wellbeing and giving them wider opportunities to pursue healthy lifestyle.

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