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The impact of the COVID-19 pandemic on the physical and mental health of children and adolescents

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The aim of this study is to identify the most significant factors that influenced the quality of life of school-aged children with chronic non-communicable diseases during COVID-19.

Materials and methods. There were 2,905 respondents in total: 2,135 children aged 10–18 years who studied in general secondary education institutions (health groups 1–3), 770 children and adolescents who sought help at the clinics (health groups 4–5).

Results. The most significant issue for all children and adolescents in the context of the COVID-19 pandemic was the threat of illness of their relatives. The second most significant issue was that children could not attend school and had to start online learning. The most common place to find information about COVID-19 was on the Internet, less often from parents, and even less often from the media and friends. Most children and adolescents did not notice any changes in their health (84.3%). Of those who experienced changes, 22.5% reported feeling unwell, drowsiness, weakness, disability, fatigue, 21.2% reported physical inactivity, and 26.5% reported deteriorating vision. They also complained of headaches, migraines, weight gain, knee pain, high blood sugar, and other. As a manifestation of the impact on the emotional and psychological state, children reported mood swings, depressive thoughts, aggressiveness, irritability, agitation, and emotional instability (14.2%). Concerns about the COVID-19 pandemic were expressed primarily in anxiety and tension in 27.3% of respondents almost constantly and 24.8% – sometimes («from time to time»); 25.5% admitted to a sense of uncertainty and instability; 19.4% were threatened with COVID-19.

Conclusions. Children have gained some experience and have prioritized the realization of the value of life and health, not only their own but also their loved ones. The second and third places were shared by mastering online learning, the ability to manage their time wisely, and expanding knowledge of hygiene skills during the pandemic. About 12% of children and adolescents have reconsidered their attitude to communication and having friends, connections with society, and have acquired new hobbies.

No conflict of interests was declared by the authors.

Keywords: COVID-19, children, adolescents, physical activity, concerns, gained experience.

Вплив пандемії COVID-19 на стан фізичного і психічного здоров'я дітей та підлітків

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Мета – визначити найбільш значущі чинники, що мали вплив на якість життя дітей шкільного віку із хронічними неінфекційними захворюваннями під час COVID-19.

Матеріали та методи. Проанкетовано 2905 респондентів: 2135 дітей 10–18 років, які навчалися в закладі загальної середньої освіти (1–3 групи здоров'я), 770 дітей та підлітків, які звернулися за допомогою до клініки (4–5 групи здоров'я).

Результати. Найбільш значущою для всіх дітей і підлітків в умовах пандемії COVID-19 була загроза захворювання рідних. Другою по значущості проблемою стало те, що діти не могли відвідувати школу і повинні були перейти на дистанційне онлайн навчання. Збільшився час знаходження біля комп'ютера, особливо це торкнулося дітей 4–5 групи здоров'я. Інформацію про COVID-19 найчастіше знаходили через Інтернет, рідше – від батьків, ще рідше – від ЗМІ та друзів. Не помітили змін у стані здоров'я – 84,3%. Із тих, хто відчув зміни, вказували на погане самопочуття, сонливість, слабкість, непрацездатність, втому – 22,5%, гіподинамію – 21,2%, погіршення зору – 26,5%. Також скаржились на головний біль, мігрень, збільшення власної ваги, біль у колінах, підвищення цукру у крові, інше. Як прояв впливу на емоційний та психологічний стан у дітей простежувалася мінливість настроїв, депресивні думки, агресивність, дратівливість, збудженість, емоційна нестабільність (14,2%). Хвилювання через ситуацію з пандемією COVID-19 виражалось насамперед тривогою та напруженістю у 27,3% респондентів майже постійно і у 24,8% – іноді («час від часу»); відчуття невизначеності, нестабільності визнавали 25,5%; загрози захворюванню на COVID-19 – 19,4%.

Висновки. Діти набули певного досвіду і пріоритетом стало усвідомлення цінності життя і здоров'я не тільки свого, а і своїх близьких. На другому та третьому місцях було освоєння навчання online, вміння розумно розподілити свій час та розширення знань щодо гігієнічних навичок у період пандемії. Приблизно 12% дітей та підлітків переглянули своє ставлення до спілкування і наявності друзів, зв'язків із суспільством, знайшли нові захоплення.

Автори заявляють про відсутність конфлікту інтересів.

Ключові слова: COVID-19, діти, підлітки, фізична активність, проблеми, які турбували, набутий досвід.

Introduction

The COVID-19 pandemic, which broke out in December 2019 in Wuhan, Hubei, China, continues to affect people around the world. Different groups of people are experiencing

the infection very differently. Despite the fact that the World Health Organization announced the end of the global state of emergency on May 5, 2023, and Ukraine canceled the quarantine on July 1, 2023, the population continues to suffer from both the infection and its consequences.

The pandemic does not spare children, if not literally, then figuratively. Children and adolescents face certain difficulties, depending on their age, how they are affected by COVID-19, and the measures taken to prevent the spread of the disease [8,21,23].

Children and adolescents are less susceptible to infection, and when they do get sick, the disease is often in a mild form. However, they can transmit the virus. At the same time, some children have a severe illness, and it can be fatal. In the United States, 821 deaths from COVID-19 (1.0 per 100,000 population) among children and adolescents were reported in 12 months (from August 1, 2021 to July 31, 2023) [11].

Children and adolescents of all ages around the world are also suffering significantly from the consequences of the pandemic. COVID-19-related measures are having a significant impact on the health and well-being of children, and some of them may suffer further negative consequences. However, while physicians are able to identify at-risk groups in the adult population, these issues are still being clarified for children [16,17].

Some complications after COVID-19 have been described only for children. First of all, this is Kawasaki syndrome, an autoimmune disease associated with inflammation of the inner wall of blood vessels. The syndrome can be manifested by acute heart and kidney failure. In the acute period, kidneys and heart may be affected. There may be thromboembolism of the lungs and brain with the development of ischemic circulatory disorders.

But the coronavirus itself is not the only problem that disturbs doctors. Some children at home are starting to get tired of isolation. They develop negative emotions and increase their fears of the «corona». Psychosomatics in children can be different. When parents experience fear, it is transmitted to their children. Sleep disturbances, digestion – all of these can occur as a result of emotional distress and stress amid the pandemic. According to scientists, the consequences of psycho-emotional stress can affect somatic, mental, and psychological health, and a prolonged negative psycho-emotional situation contributes not only to the development of disorders in various body systems but also to their accumulation, which necessarily leads to a decrease in health. Mental and psychological disorders deserve extra attention. The latter affect the main spheres of personality: emotional, cognitive, behavioral, motivational, and communicative, and can lead to global personality problems. The issues of disorders in

various aspects of health and quality of life in the context of traumatic situations in childhood are not sufficiently defined, and the consequences of COVID-19 among patients of this age with chronic non-communicable diseases have not been studied.

The Coronavirus pandemic (COVID-19) has had a serious impact on children around the world. COVID-19 will have long-term consequences beyond the pandemic itself. For Ukrainian children, these consequences have been layered on top of a full-scale war and require further research.

The *aim* of this study is to identify the most significant factors that influenced the quality of life of school-aged children with chronic non-communicable diseases during COVID-19.

Materials and methods of the study

During the study, a survey of children was conducted. The questionnaires were developed by the Institute's scientists and approved by the Academic Council of the State Institution «ICAHN NAMS»: «Questionnaire for children on the impact of the COVID-19 situation». A total of 2,905 respondents were interviewed: 2,135 children aged 10–18 who studied at general secondary education institutions (health groups 1–3), 770 children and adolescents who sought help at the clinic of the State Institution «ICAHN NAMS» (health groups 4–5). Among 2,135 surveyed schoolchildren (health groups 1–3), there were 909 boys (42.6%), and 1,226 girls (57.4%). Of the 770 children and adolescents with health groups 4–5, 302 children were male (39.2%), and 468 children were female (60.8%).

Databases (with respondents' answers) were created using the Google Forms survey tool in Google Sheets and Excel format. The databases were constantly filled and updated. Corrections were made to the databases for further processing of the responses.

Indicators of general health, psychological well-being, and social functioning of vitality were examined.

The set of researches was conducted in accordance with the basic provisions and ethical and moral requirements of the Charter of the Ukrainian Association for Bioethics and the norms of GCP (1992), GLP (2002), the principles of the Declaration of Helsinki of Human Rights, the Council of European Convention of Human Rights and Biomedicine approved by the Committee on Medical Ethics at the State Institution «Institute for Children and Adolescents Health Care of the National Academy of Medical Sciences of Ukraine».

Table 1

What worried children and adolescents the most during quarantine

The main problems	Children and adolescents, n=770	
	N	%
Threat of family members' illness	506	65.7
Remote learning	430	55.8
The state of one's own health	375	48.7
Restrictions on communication with friends and other people	368	47.8
Restrictions on outdoor activities	300	39.0
Restrictions on visiting classes and clubs	225	29.2
Uncertainty about the possibility of passing exams, ZNO (External Independent Evaluation), and DPA (State Final Examination)	188	24.4
The need to work a lot with computers (gadgets)	173	22.5
Financial deterioration of the family	146	19.0
Excessive consumption of food	85	11.0
Tense family environment, quarrels in the family	68	8.8
Other	99	12.9

Table 2

The structure of problems that worried adolescents during quarantine, depending on health groups and gender (%±m)

The main problems	Adolescents of health groups 1–3			Adolescents of health groups 4–5		
	total (n=2,135)	boys (n=909)	girls (n=1,226)	total (n=769)	boys (n=301)	girls (n=467)
Threat of family members' illness	36.3±1.0	36.6 ±1.6 ¹	36.1±1.4 ²	18.2±0.8	18.8±1.4 ¹	17.9 ±1.0 ²
Remote learning	14.2±0.8	16.1 ±1.2 ³	12.8±1.0 ³	13.5±0.7	14.6±1.2	12.8±0.9
The state of one's own health	9.1±0.6	8.7±0.9	9.4±0.8	10.7±0.7	10.5±1.1	10.8±0.8
Restrictions on communication	8.9±0.6	7.7±0.9 ^{1,3}	9.9±0.9 ^{2,3}	13.4±0.7	14.5±1.2 ¹	12.7±0.9 ²
Restrictions on outdoor activities	4.4±0.4	4.4±0.7 ¹	4.5±0.6 ²	11.4±0.7	12±1.1 ¹	11.1±0.8 ²
Restrictions on visiting classes and clubs	4.8±0.5	5.2±0.7 ¹	4.5±0.6 ²	8.1±0.6	8.4±1.0 ¹	7.9 ±0.7 ²
Passing exams, ZNO, DPA	4.3±0.4	3.9±0.6	4.6±0.6 ²	6.4±0.5	5.6±0.8	6.9±0.7 ²
The need to work a lot with computers (gadgets)	3.7±0.4	3.4±0.6 ¹	3.8±0.5 ²	6.4±0.5	6.3±0.9 ¹	6.4±0.7 ²
Financial deterioration of the family	6.1±0.5	6.5±0.8 ³	5.9±0.7 ³	5.8±0.5	5.6±0.8	5.9±0.6
Excessive consumption of food	1.4±0.3	0.9±0.3	1.8±0.4 ²	3.5±0.4	1.7±0.5 ⁴	4.5±0.6 ^{2,4}
Tense family environment, quarrels in the family	1.9±0.3	1.2±0.4 ³	2.4±0.4 ³	2.6±0.3	2±0.5	3±0.5
Other	4.8±0.5	5.5±0.8	4.3±0.6	0±0	0±0	0±0

Notes: 1 – p<0.02–0.00001 when comparing boys of health groups 1–3 to 4–5; 2 – p<0.05–0.00001 when comparing girls of health groups 1–3 to 4–5; 3 – p<0.04–0.02 when comparing boys and girls of health groups 1–3; 4 – p<0.01 when comparing boys and girls of health groups 4–5.

The database and the results were statistically processed using Microsoft Excel and SPSS 17.0.

The results are presented in tables as percentages and standard error of the arithmetic mean (±m). Comparisons between the groups were performed using nonparametric methods (Wilcoxon–Mann–Whitney, Fisher's angular transformation). The results were considered significant at p<0.05.

Results of the study and discussion

Almost all children and adolescents (98.4%) who took part in the survey admitted that they were

concerned about various issues during the pandemic and quarantine (Table 1). And only 1.6% of respondents said that they were «not particularly worried about anything» during the quarantine and pandemic.

Our survey data shows that the most important thing for all children and adolescents in the context of the COVID-19 pandemic was the threat of family members' sicknesses. It is completely the same regardless of health status. The second most important problem was that children could not attend school and had to start online learning.

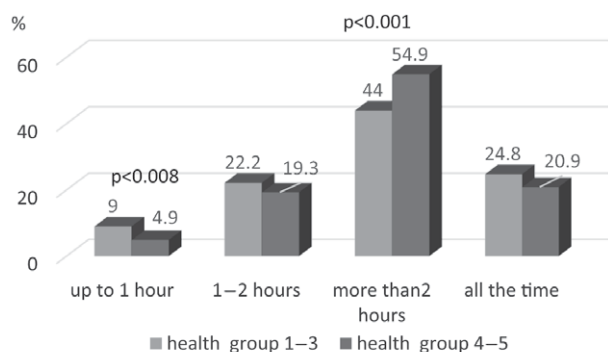


Fig. 1. Distribution of boys with different health levels depending on the time they spend using a computer, smartphone, tablet every day

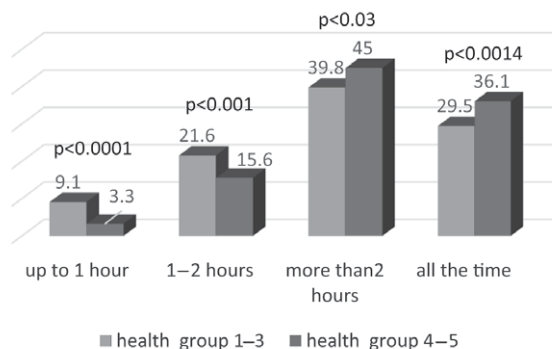


Fig. 2. Distribution of girls with different health levels depending on the time they spend using a computer, smartphone, tablet every day

The distribution of respondents' answers by health status group and gender is presented in Table 2.

As we can see from Table 2, boys and girls in health groups 4-5 reacted more severely to the threat of getting sick, various restrictions, and the need to work more with computers. Girls in health groups 4-5, compared to adolescents in health groups 1-3, were much more likely to be concerned about excessive food consumption and worried about passing ZNO exams, unlike boys. Girls in health groups 1-3, compared to boys, were significantly less likely to worry about the need for remote learning but were significantly more likely to worry about restrictions in communication and tense family environment.

Internet usage reduces time spent on other useful activities and can negatively affect children's emotional health and psychological well-being [22]. The analysis of computer, smartphone, and tablet use revealed that boys tended to spend more than 2 hours on the computer (Fig. 1), and there were significantly more adolescents in the decompensation state than children and adolescents in the compensation state.

Girls in health groups 4-5 were much more likely to use a computer, smartphone, or tablet for more than 2 hours, and more than a third of them spent almost the entire day with their devices (Fig. 2).

In response to the spread of the new coronavirus disease, unprecedented restrictions called «general self-isolation regime» and «general quarantine» were introduced. However, these measures turned out to be a double-edged sword: on the one hand, they may have slowed the spread of the infection, but on the other hand, they led to various adverse effects and had a negative impact on health [3,6].

The vast majority of children and adolescents (95.3%) who participated in the study understood what coronavirus (COVID-19) was, and 87.3% had some idea of the symptoms of the disease.

The leading sources of information (Table 3) about COVID-19 for children and adolescents were the Internet and social media (71.4% of respondents); parents and relatives (39.9% of respondents); media (38.3% of respondents); and friends (15.3% of respondents). The sources of information about the coronavirus that respondents rarely used were: spe-

Table 3

Sources of trustworthy information, according to adolescents, about COVID-19 (%±m)

Sources of information	Adolescents of health groups 1-3			Adolescents of health groups 4-5		
	Total (n=2,135)	Boys (n=909)	Girls (n=1,226)	Total (n=769)	Boys (n=301)	Girls (n=467)
Internet and social media	63.8±1.0	58.1±1.6 ^{1,3}	68±1.3 ^{2,3}	72.0±0.9	64.3±3.1 ^{1,4}	77.2±2.2 ^{2,4}
Parents and relatives	45.6±1.1	44.7 ±1.6 ¹	46.3±1.4	41.9 ±0.7	34±3.0 ^{1,4}	47.2±2.6 ⁴
Mass media	28.5±1.0	27.4±1.5	29.4±1.3	27.2±0.6	24.2±2.7	29.2±2.4
Friends	13.8±0.7	14.2±1.2	13.5±1.0 ²	16.7±0.5	11.5±2.0 ⁴	20.3±2.1 ^{2,4}
Not interested	20.6±0.9	21.5±1.4	19.9±1.1	12.8 ±0.4	18.9±2.5	8.6±1.5

Notes: 1 – p<0.03–0.0001 when comparing boys of health groups 1-3 to 4-5; 2 – p<0.0001 when comparing girls of health groups 1-3 to 4-5; 3 – p<0.0001 when comparing boys and girls of health groups 1-3; 4 – p<0.0001 when comparing boys and girls of health groups 4-5.

Table 4

Dynamics of changes in students' physical activity during COVID-19 (%±m)

The amount of students' physical activity	Adolescents of health groups 1–3			Adolescents of health groups 4–5		
	Total (n=2,135)	Boys (n=909)	Girls (n=1,226)	Total (n=769)	Boys (n=301)	Girls (n=467)
Decreased	39.6±1.1	39.6±1.6	39.6±1.4 ²	46.5±2.0	44.7±3.2	47.8±2.6 ²
Not changed	48.7±1.1	49.1±1.7	48.4±1.4	45.5±2.0	47.5±3.2	44.2±2.6
Increased	11.8±0.7	11.3±1.1 ¹	12.1±0.9 ²	7.9±1.1	7.8±1.7 ¹	8.1±1.42

Notes: 1 – p<0.04 when comparing boys of health groups 1–3 to 4–5; 2 – p<0.006–0.0001 when comparing girls of health groups 1–3 to 4–5.

cialized medical websites (0.9% of respondents); teachers at school (0.4% of respondents); and health-care workers (0.1% of respondents).

The COVID-19 issue was not interesting to 12.9% of respondents at all. They noted that they were not looking for or interested in this information.

The distribution of respondents' answers to the questionnaire by health status and gender is shown in Table 3.

Thus, girls in both health groups more often use the Internet and social media as a reliable source of information than boys, and this source is especially important for girls in decompensation (77.2%). Decompensated boys are less likely to consider parents and relatives as a source of trustworthy information about COVID-19 (34.0%). For decompensated girls, friends are more important as a source of trustworthy information about COVID-19 (20.3%) than for other respondents. In general, decompensated girls are more interested in information about COVID-19.

To protect themselves from COVID-19, the vast majority of children and adolescents (70.1%) said they follow certain rules of behavior (wear a mask, wash hands, keep a distance, etc.) to avoid getting sick, but about a third (29.9%) of respondents admitted that they do not always follow the rules.

The study found that the majority (63.8%) of respondents did not have anyone in their close social circle who had coronavirus. However, 35.6% of respondents have been infected by the disease.

The available literature sources indicate that COVID-19 has had a serious impact on children around the world. This primarily concerns mental health and well-being, disruption of family income, and related stressors, including increased domestic violence, delays in health care, and the critical issue of prolonged loss of full-time learning in a regular school environment [14,24,28].

Our survey revealed that 84.3% of respondents did not notice any significant changes in their health.

At the same time, 14.7% of children and adolescents felt significant changes in their health, and 1.0% of respondents hesitated to answer this question.

Of those who felt changes in their health status, 74.8% reported a deterioration in health, and 25.2%, on the contrary, noted an improvement.

Children identified the following as factors that improved their health during quarantine: increased time spent outside (walks, outdoor games, physical exercises), increased free time, particularly for physical education and sports, and a decrease in common respiratory diseases.

However, the majority of children and adolescents (74.8%) who felt changes in their health as a manifestation of the negative impact of the pandemic and quarantine on their physical well-being noted adverse health changes: poor health in general, drowsiness, weakness, inability to work, fatigue (especially due to excessive use of computers, smartphones, and various gadgets) – 22.5%, physical inactivity (sedentary lifestyle) – 21.2%, and impaired vision (26.5%). They also mentioned headaches, migraines, weight gain, knee pain (including due to weight gain), increased blood sugar, and others.

Quarantine and isolation are psychologically difficult and unpleasant conditions for everyone who experiences them [25]. Children and adolescents are at higher risk of developing mental health problems than adults [18]. They may be particularly vulnerable to the adverse effects of isolation, including school closures and self-isolation, which disrupt their physical activity and social interaction. The available literature sources show that during isolation, symptoms of anxiety exacerbation were recorded in 57.4% of studies [1,5,27]. Their prevalence ranged from 1.8% [30] to 49.5% [13].

In our study, as a manifestation of the impact on the emotional and psychological well-being of children, we noted changeable mood, depressive thoughts, aggressiveness, irritability, agitation, and emotional instability (14.2%).

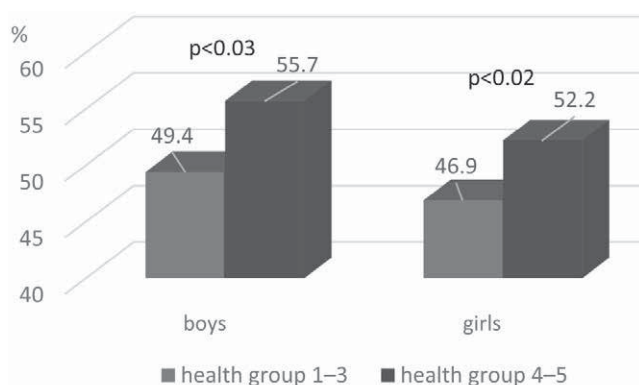


Fig. 3. Outdoor activities (walks, outdoor games) for more than 2 hours among children and adolescents of different health groups and genders during COVID-19

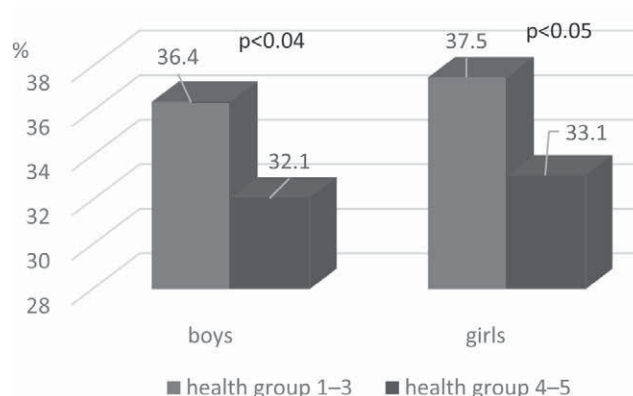


Fig. 4. Outdoor activities (walks, outdoor games) for children and adolescents of different health groups and genders for up to 2 hours during COVID-19

Concerns about the situation with the COVID-19 pandemic were expressed primarily in anxiety and tension in 27.3% of respondents almost constantly and 24.8% – sometimes («from time to time»); 25.5% – admitted to a sense of uncertainty and instability; 19.4% – recognized the threat of being infected with COVID-19 (the possibility of infection). This is in line with the literature on anxiety among children and adolescents related to the consequences of COVID-19, i.e. the lack of daily routine, isolation, and impact of the media [2,4,15,29].

Undoubtedly, physical health is ensured by a certain regimen of physical activity. During quarantine, physical activity remained unchanged in 47.5% of respondents, decreased in 45.2%, and even increased in 7.3% (Table 4).

According to Table 4, the amount of physical activity decreased the most among children and adolescents in the decompensation state (44.7% of boys and 47.8% of girls) than among respondents in the compensation state (39.6% of boys and 39.6% of girls).

Regarding outdoor activities (walks, outdoor games), it was discovered that during quarantine,

children and adolescents spent more than 2 hours a day (50.4% of respondents); 1–2 hours a day (33.8%); less than 1 hour a day (14.5%); did not leave the house every day (1.3%). It should be noted that adolescents of health groups 4–5 spent more than 2 hours outdoors much more often than their peers of health groups 1–3 (Fig. 3).

Staying outdoors for 1 to 2 hours was more typical for healthy adolescents (Fig. 4).

Some children had problems with sleep. There is evidence in the literature that 20% of children [26] and 55.6% of adolescents reported sleep problems [7]. During the quarantine, the proportion of children with sleep disorders increased from 40% to 62% [12]. Most studies reporting on sleep disturbances showed that young people slept longer during isolation ($p<0.001$) [12,19].

Nighttime sleep for 56.4% of respondents lasted 8–9 hours, for 24.9% of respondents – less than 8 hours, for 17.4% of respondents – more than 9 hours, 1.3% of respondents found it difficult to determine the duration of their nighttime sleep, it was not constant. The data should be considered in relation to the age norm of respondents' sleep (Table 5).

Table 5

Duration of night sleep of children and adolescents during COVID-19 (%±m)

Duration of night sleep	Adolescents of health groups 1–3			Adolescents of health groups 4–5		
	Total (n=2,135)	Boys (n=909)	Girls (n=1,226)	Total (n=769)	Boys (n=301)	Girls (n=467)
Above the norm	9.4±0.6	11.1±1.0 ^{1,3}	8.2±0.8 ^{2,3}	20.2±1.6	23.4±2.7 ^{1,4}	18.1±2.0 ^{2,4}
In line with the norm	57±1.1	60.6±1.6	54.2±1.4	55.6±2.0	58.2±3.2	53.9±2.6
Less than the age norm	33.6±1.0	28.3±1.5 ^{1,3}	37.6±1.4 ^{2,3}	24.2±1.7	18.4±2.5 ^{1,4}	28.1±2.4 ^{2,4}

Notes: 1 – $p<0.0001$ when comparing boys of health groups 1–3 to 4–5; 2 – $p<0.0001$ when comparing girls of health groups 1–3 to 4–5; 3 – $p<0.01–0.0001$ when comparing boys and girls of health groups 1–3; 4 – $p<0.04–0.001$ when comparing boys and girls of health groups 4–5

Table 6

New experiences of children and adolescents during COVID-19

Rank	The child's new experience	Specific gravity (%)
I	Remote learning (including the algorithm of its implementation, learning time, the possibility of learning on educational Internet platforms)	25.5
II	Realization of the value of life and health / need to value one's health and take care of it	24.1
III	Importance of hygiene practices	20.8
IV	Awareness that one should care about his/her loved ones	16.8
V	Experience in keeping a physical distance between people	10.2
VI	The need to improve learning and communication skills in online mode	9.1
VII	The importance of self-discipline and the ability to manage own time	6.6
VIII	The emergence of a new hobby, skill (for example: knitting, drawing, etc.)	5.1
IX	Realization of the value of communication and having friends	4.4
X	Communication with society is one of the most important needs of every person	1.8

Children and adolescents in the decompensation state are more likely to sleep longer in general (20.2%) than children and adolescents in the compensation state (9.4%). It should be noted that boys in both the health group 1–3 and the health group 4–5 had significantly longer sleep duration than girls. On the contrary, a decrease in sleep duration was more typical for children and adolescents in the compensation state.

During the survey, it was found out what were the most important new experiences that children and adolescents had during the quarantine period. The majority of respondents (64.4%) believe that they have not gained any new experience during the COVID-19 pandemic. However, 35.6% of respondents had made some conclusions. The structure of important new experiences of children and adolescents (based on the respondents' answers) is presented in Table 6.

Adolescents are especially in need of social contacts and interpersonal relationships. Adolescence is a motivator for connecting with peers [9] and seeking peer support and social support [10], which contributes to identity development. However, during the quarantine, they need to attend online classes, cope with school closures, and adapt to the forced reduction of social contacts [20]. We can see that the largest percentage of children prioritized the realization of the value of life and health, not only their own but also their loved ones. The second and third places were shared by mastering online learning, the ability to manage their time wisely, and expanding knowledge of hygiene skills during the pandemic. About 12% of children and adolescents have reconsidered their attitude to communication and having friends, social contacts, and have acquired new hobbies.

Conclusions

1. It was determined that in the context of the pandemic, adolescents were most often concerned about the threat of illness of their relatives (65.7%), remote learning (55.8%), less often about their health (48.7%) and restrictions on communication with friends (47.8%). At the same time, the threat of relatives' illness was more frequent among students who were healthy or had only functional disorders of various organs and systems, chronic diseases in the inactive phase (health group 1–3).

2. The study found that 84.3% of respondents did not notice any negative impact of the pandemic and quarantine on their health. Only 10.4% of the surveyed children believe they have been ill with COVID-19, and 25.2% in their close environment. The leading sources where adolescents found trustworthy information were the Internet and social media (63.8–72.0%).

3. Only 15.7% of adolescents recognized negative changes in their health, which, in their opinion, was indicated by poor health, drowsiness, weakness, inability to work, fatigue, headaches, migraines, knee pain, weight gain, mood swings, depressive thoughts, aggressiveness, irritability, emotional instability, and obsessive thoughts. The majority of respondents received medical care at the clinics at their place of residence, but 25.4% of children (health group 3–4) did not receive it.

4. In the structure of new experiences gained during COVID-19, the majority of adolescents identified: remote learning (25.5%), awareness of the value of life and health (24.1%), and the importance of hygiene (20.8%), and the realization that they should care about their loved ones (16.8%). In 45%

of respondents, physical activity decreased during quarantine, especially in groups of children with chronic diseases in the acute stage ($p < 0.05\%$). Only 50.4% of respondents were outdoors for two or more hours, and about 15.0% of respondents were outdoors for less than one hour. It was found that 49.1% of children use the computer more than two hours a day, and 29.1% almost all the time, especially respondents of health groups 4–5. Most of the children had 3–4 meals a day, and the duration of night sleep was normal (56.4%), but 17.4% of respondents had excessive sleep, especially boys.

Thus, the COVID-19 quarantine brought significant changes to the lives of adolescents. Fear for health (personal and relatives), distance learning, restrictions on communication with friends, reduced physical activity, and prolonged computer use throughout the day, all this contributed to a deterioration in the quality of life. Although most adolescents did not notice a negative impact on their health, some children (15.7%) experienced adverse changes in their health, including poor health, drowsiness,

weakness, inability to work, fatigue, headache, migraine, knee pain, mood swings, depressive thoughts, aggressiveness, irritability, emotional instability, obsessive thoughts. However, children and adolescents noted the acquisition of new experiences – this concerned the ability to learn remotely, awareness of the value of life and health, the importance of following hygiene rules, the awareness that one must cherish one's loved ones, the importance of self-discipline and the ability to allocate one's time, and the awareness of the value of communication and having friends.

The prospects of the research are to further study the impact on various aspects of health and quality of life of the consequences of the pandemic in the context of a full-scale war in Ukraine.

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