

THE DURATION OF PHYSICAL ACTIVITY AND NIGHTTIME SLEEP IN THE DAILY ROUTINE OF A MODERN SCHOOLCHILD

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Both in Russia and abroad, physical activity, screen time, and nighttime sleep are considered important and controllable daily routine factors that influence a schoolchild's general physical and mental state and health. This study aimed to explore the specifics of the daily routine of schoolchildren living in different regions of the Russian Federation (RF). We analyzed data collected by surveying schoolchildren and their parents in the context of implementation of the "Strengthening Public Health" Federal Project in 2023–2024; the data described durations of some regular activities in the daily routines of the 2nd, 5th, and 10th grade schoolchildren living in the Russian Federation ($n = 254,881$). Russian schoolchildren are in school for an average of 5–7 hours every day (86.3% [95% CI: 86.2–86.4]). The proportion of children who comply with the recommendations of the World Health Organization (WHO) and engage in physical activity for at least 60 minutes per day was 58.5% [95% CI: 58.3–58.7]. It was established that the share of children practicing physical activity in sufficient amounts decreases with progression through the grades. For a significant proportion of children, the duration of their nighttime sleep is insufficient (86% [95% CI: 85.78–86.22] of 2nd grade schoolchildren, 23.3% [95% CI: 23.14–23.58] of fifth graders, and 49.2% [95% CI: 48.8–49.6] of 10th grade schoolchildren). The analysis allowed identifying the regions of the Russian Federation where the greatest shares of children whose daily routines are inadequate. Thus, it can be noted that, despite an average workload at school, a significant number of Russian schoolchildren do not use their free time optimally in terms of physical activity and adequate sleep.

Keywords: survey, schoolchildren's daily routine, physical activity, nighttime sleep duration

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Compliance with ethical standards: the study was approved by the Ethics Committee of the Novosibirsk Research Institute of Hygiene of Rospotrebnadzor (protocol No. 1 of January 11, 2024); all participants submitted the signed informed consent forms.

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ПРОДОЛЖИТЕЛЬНОСТЬ ДВИГАТЕЛЬНОЙ АКТИВНОСТИ И НОЧНОГО СНА В БЮДЖЕТЕ ВРЕМЕНИ СОВРЕМЕННОГО ШКОЛЬНИКА

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Как в России, так и за рубежом уделяют большое внимание физической активности, экранному времени и ночному сну как управляемым факторам режима дня школьника, оказывающим существенное влияние на самочувствие и здоровье ребенка. Целью работы было определить особенности режима дня школьников, проживающих в разных субъектах Российской Федерации (РФ). Для анализа использовали данные опроса школьников и их родителей, проведенного в ходе реализации Федерального проекта «Укрепление общественного здоровья» в 2023–2024 гг., о продолжительности режимных моментов обучающихся 2-х, 5-х, 10-х классов, проживающих на территории РФ ($n = 254\,881$). Согласно опросу, российские школьники ежедневно в среднем находятся в школе в течение 5–7 ч (86,3% [95% ДИ: 86,2–86,4]). Удельный вес детей, выполняющих рекомендации Всемирной организации здравоохранения (ВОЗ) и ежедневно уделяющих физической активности не менее 60 мин в день, составил 58,5% [95% ДИ: 58,3–58,7]. Установлено, что с переходом в старшие классы количество детей с достаточной физической активностью снижается. У значительной части детей отмечают дефицит продолжительности ночного сна (у 86% [95% ДИ: 85,78–86,22] обучающихся 2-х классов, у 23,3% [95% ДИ: 23,14–23,58] пятиклассников и у 49,2% [95% ДИ: 48,8–49,6] обучающихся 10-х классов). Анализ позволил определить регионы РФ, где больше всего детей с нарушениями режима дня. Таким образом, можно отметить, что при средней загруженности учебными занятиями в школе значительная часть российских школьников не оптимально использует бюджет свободного времени в отношении физической активности и достаточности сна.

Ключевые слова: анкетирование, режим дня школьников, физическая активность, продолжительность ночного сна

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Соблюдение этических стандартов: исследование одобрено этическим комитетом ФБУН «Новосибирский НИИ гигиены» Роспотребнадзора (протокол № 1 от 11 января 2024 г.), от всех участников исследования получено письменное информированное согласие.

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A modern schoolchild's daily routine features a heavy workload associated with studying and prolonged use of electronic devices (mobile phone, tablet, computer), which leads to physical inactivity, less time spent outdoors, and deteriorating quality and duration of sleep. All of the above factors increase static and visual loads and strain regulatory systems, which predicts erosion of both physical and mental health of the child [1–5].

For a schoolchild, an essential prevention tool is a rationally compiled daily routine that alternates hygienically regulated periods of work and rest, sufficient physical activity and night sleep, daily walks in the fresh air, balanced and rational nutrition [1, 5].

This study aimed to explore the specifics of the daily routine of schoolchildren living in different regions of the Russian Federation (RF).

PATIENTS AND METHODS

We analyzed survey data collected in the context of implementation of the "Strengthening Public Health" Federal Project in 2023–2024. The data described durations of some regular activities in the daily routines of schoolchildren aged 7 through 17 years, living in the RF ($n = 254,881$). In particular, the study focused on the duration of everyday physical activity of children, the time spent on school-related studying and extracurricular education, and the duration of nighttime sleep. The standard frequencies and durations of high (sports games, competitions, aerobics) and moderate intensity (outdoor games, physical education, cycling, swimming) physical activity for children aged 5–17 years were determined as per the recommendations of the World Health Organization (WHO, 2020) [6].

Microsoft Excel (Microsoft; USA) software was used for statistical processing of the data. The nominal data are given as relative incidence of the studied indicators (n (%)) with a 95% confidence interval. The statistical significance of the differences in relative indicators was assessed using the Pearson Chi-square method (χ^2). The differences were considered significant at $p = 0.01$.

RESULTS

The majority of schoolchildren stay at school for 5–7 hours (86.3% [95% CI: 86.2–86.4]); 6.4% of respondents spend there 8–9 hours, with most of them residing in the Central (10.8%; $\chi^2 = 112.6$; $p < 0.01$) and Northwestern (7.1%; $\chi^2 = 125.4$; $p < 0.01$) Federal Districts. Less than half a percent — 0.2% — admitted to spending 10 hours at school, with the maximum number of such schoolchildren registered in the Siberian and Far Eastern Federal Districts (0.5%).

A survey of parents about their children's daily physical activity revealed regions where this indicator differs from the average. In the RF, the average share of children attending high-intensity sports activities (sports games, competitions, aerobics) three or more times a week was 21.6% [95% CI: 21.45–21.76]. Approximately the same number of children

attended sports clubs twice a week, and had at least 60 minutes of physical activity per day (18%). The share of children who engage in outdoor games and other such types of physical activity for at least 60 minutes per day was 18.9%. On average, 15% of children did not attend sports clubs. This indicator was higher than the average in the Kabardino-Balkarian Republic (23.4%), Krasnoyarsk Region (22.6%), Irkutsk Region (22.5%), Novgorod Region (21.9%), Chechen Republic (21.2%), Republic of Sakha (Yakutia) (21.0%). The mean share of children who practice physical activity for less than 60 minutes a day no more than 2–3 times a week was 9.7%, and 7.5% of children were physically active for less than 60 minutes a day.

These results allowed identifying groups of children with different levels of physical activity. Central and Southern Federal Districts had the highest proportion of children who were sufficiently (at least 60 minutes per day) and highly physically active: 61.2% and 60.5%, respectively, while the average for the Russian Federation is 58.5% [95% CI: 58.3–58.7] (Fig. 1).

The responses related to the physical activity levels given by schoolchildren of 2nd, 5th, and 10th grades indicate that the share of those having sufficient amounts thereof decreases with progression through the grades. The threshold of sufficiency was overcome by 63.6% [95% CI: 63.2–64.0] of second graders, 57.6% [95% CI: 57.44–57.92] of 5th grade pupils, and 53.5% [95% CI: 53.1–53.9] of 10th grade schoolchildren. As for low levels of physical activity, such were typical for 27.4% [95% CI: 27.0–27.8] of 2nd grade pupils, 32.9% [95% CI: 32.78–33.1] of fifth graders, and 37% [95% CI: 36.6–37.4] of 10th grade schoolchildren.

On average, 39.7% of schoolchildren in the RF attend extracurricular classes in the school they study in. The largest number of children enrolled in such programs directly at school was registered in the Chukotka Autonomous Okrug (59%), Republic of Sakha (Yakutia) (56%), Amur Region (53%), Belgorod Region (52%), Republic of Crimea (51%), and Sakhalin Region (51%) (Fig. 2).

Hygiene standards prescribe different durations of night sleep to different ages of children [7]. Schoolchildren aged 8–10 years should have at least 10 hours of night sleep. Eighty-

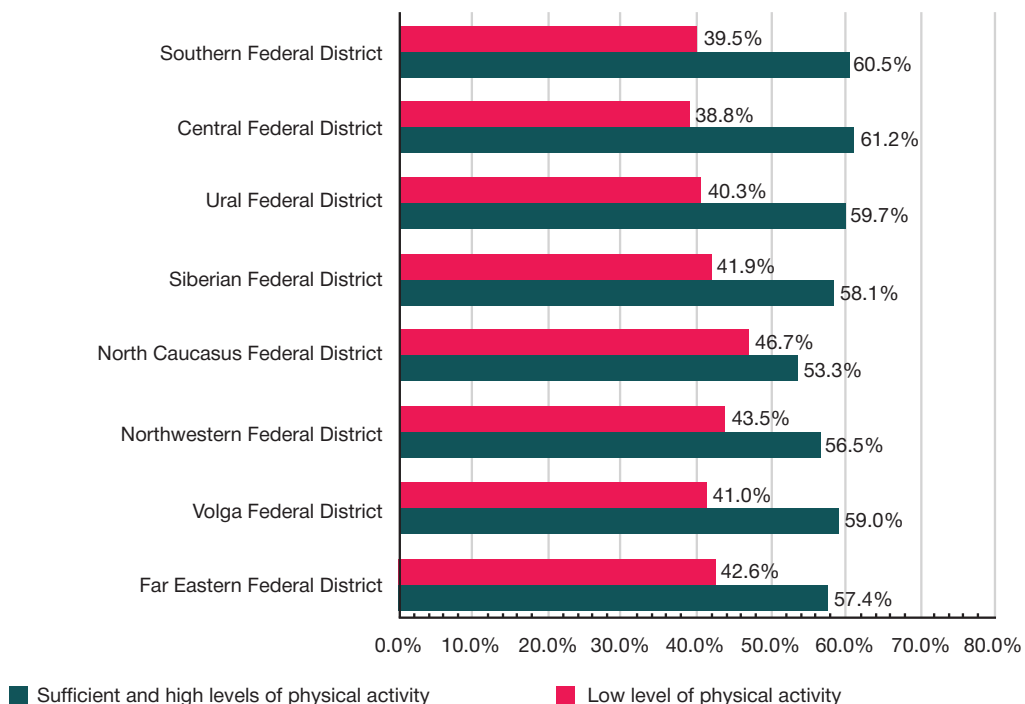


Fig. 1. The level of physical activity, schoolchildren of grades 1–11, physical education, dancing, and sports clubs factored in

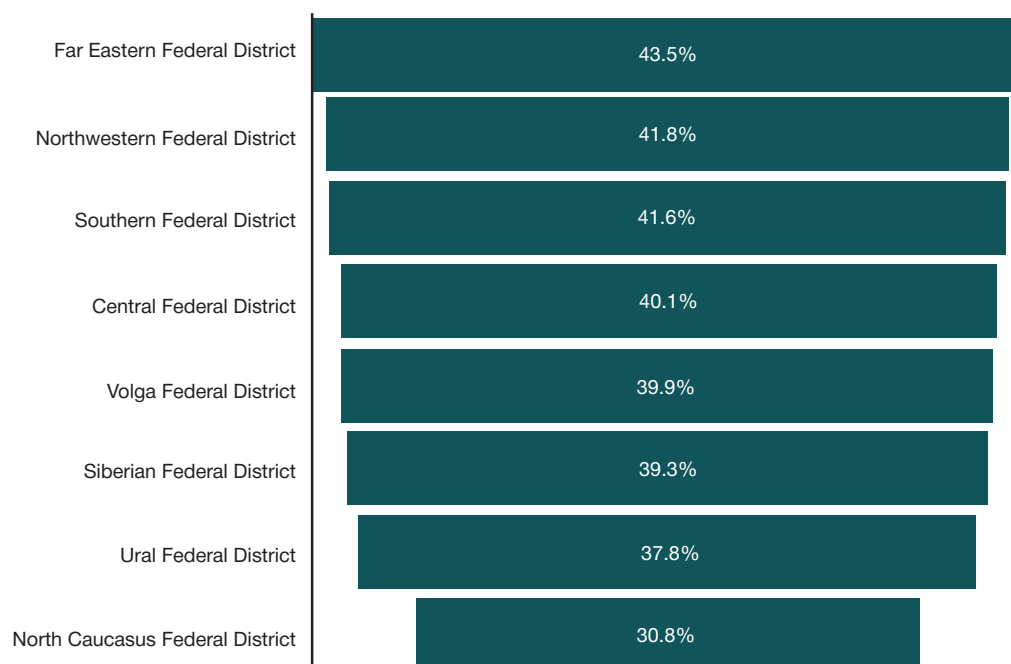


Fig. 2. The proportion of children attending extracurricular classes, clubs, and sports sections in a general education organization

six percent of the respondents noted that on a weekday, their 2nd grade children sleep less than 10 hours at night. For children aged 11–14, the duration of a night's sleep should be at least 9 hours, and 76.7% of the respondents confirmed that their fifth graders sleep as much. The norm for children aged 15 and above is 8 to 10 hours of nighttime sleep; only 50.8% of 10th grade pupils admitted to fulfilling this norm. Thus, it can be said that a significant part of school-age children do not follow the night sleep duration recommendations (86% [95% CI: 85.78–86.22] of 2nd grade pupils, 23.3% [95% CI: 23.14–23.58] of fifth graders, and 49.2% [95% CI 48.8–49.6] 10th grade schoolchildren).

The analysis revealed regions with a low proportion of children having sufficient night sleep duration: 2nd grade students — in Republic of Ingushetia (2.5%), Nenets Autonomous Okrug (2.6%), Tambov Region (3.8%), Republic of Mordovia (4.1%), Sakhalin Region (5%), Voronezh Region (5%); 5th grade students — in Republic of Dagestan (55.7%); 10th grade students — in Nenets Autonomous Okrug (22.1%), Altai Republic (29.1%).

DISCUSSION

The survey of parents of Russian schoolchildren revealed trending disruptions of the modern children's daily routines, which is consistent with the literature data. There is another study that reported similar results: low levels of physical activity for 28–36% of schoolchildren, and growth of this figure along with progression through the grades [8]. Other papers by Russian researchers note that modern schoolchildren tend to spend more time studying, using electronic devices, and watching television to the detriment of walking, physical activity, and sleep [8–10]. There is evidence that 44–47.1% of school-age children today enjoy less sleep than they should [11, 12].

A similar survey conducted in the US revealed that most children and adolescents there sleep as recommended (86%), but take advice on the sufficient levels of physical activity and screen time much less enthusiastically, with 23% and 33%, respectively, complying with the respective standards. Overall, only 9% of children and adolescents there follow all the daily routine guidelines; in Canada, the share of fully complying children is 17.5%, in Australia — 14.9%. It was found that taking up the three core recommendations (about increasing physical activity, reducing screen time, and ensuring optimal sleep duration) was associated with a lower 72% chance of obesity. Similar results were registered for other health indicators, cardiometabolic risk, and cognitive functions [13–16]. Previous works by foreign researchers thoroughly investigated the effect of sufficient sleep on the prevention of development of mental disorders in children [17–19].

CONCLUSIONS

According to the survey, on average, Russian schoolchildren spend 5–7 hours in school every day (86.3% [95% CI: 86.2–86.4]). On the national level, the proportion of children who follow WHO recommendations and engage in at least 60 minutes of physical activity per day was 58.5% [95% CI: 58.3–58.7]; 21.6% [95% CI: 21.45–21.76] of children attend high-intensity physical activity classes at (sports clubs) least three times a week. It was established that the share of children practicing physical activity in sufficient amounts decreases with progression through the grades. A significant proportion of children do not comply with with recommendations on the duration of night sleep, which can lead to mental health disorders. Thus, it can be noted that, despite an average workload at school, a significant number of Russian schoolchildren do not use their free time optimally in terms of physical activity and adequate sleep.

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