PECULIARITIES OF NEURO-PSYCHIC STATE AND LIFE QUALITY OF CHILDREN AND TEENAGERS FORMED UNDER INFLUENCE EXERTED BY RISK FACTORS EXISTING IN EDUCATIONAL ENVIRONMENT

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Today education is being modernized in the RF and it involves active development of innovative educational establishments, particularly, those where students stay round-the-clock. Intra-school environment in such establishments has its peculiarities and there are several factors in the educational process there which influence a child's body thus deteriorating his or her physical and mental health. To make educational processes efficient in such establishments, it is necessary to pay close attention to children's neuro-psychic state and quality of their life. Our research goal was to assess students' neuro-psychic state and quality of their life in an educational establishment where they stayed round-the-clock. We performed this assessment via questioning with standard questionnaires. As a result, we revealed that such adverse factors in the intra-school environment as non-rational organization of the educational process and daily regimen led to poorer neuro-psychic state and lower quality of children's life. It became obvious through an increase in number of students with higher anxiety level, from 16 % in the fifth grade to 19 % in the tenth grade. Both physical and mental components of life quality also deteriorated. We revealed that anxiety level and life quality parameters depended on non-rational organization of the educational process and daily regimen.

The existing situation calls for working out and implementation of modern preventive health-preserving activities and active medical support provided for the educational process; these activities should be aimed at lowering risks caused by negative influence exerted by intra-school environment factors on students' neuro-psychic state and quality of their life.

Key words: neuro-psychic state, life quality, educational process, children, teenagers, risk factor, educational environment.

The system of school education in the RF has been undergoing substantial reforms over the recent years. These reforms, in particular, involve creation of occupational training for senior school students, and it results in greater education loads. So, it is necessary to explore issues related to health preservation in case of children and teenagers who attend new innovative educational establishments where intensive training technologies are implemented, including those schools where students stay round-the-clock [1, 2]. Educational processes in such establishments have their peculiarities which are determined by round-the-clock influence exerted on a child's body by a set of intra-school factors and intense educational loads; this influ-
ence leads to disorders both in physical and mental health of a student [3–5]. Successful adaptation of children and teenagers during their studies in modern educational establishments depends on a great number of life activity factors which form students' biological and psycho-social state [1, 4–11]. Round-the-clock complex exposure of students' bodies to intra-school factors involves greater educational loads and greater volumes of information which students have to obtain and process. At the same time, students permanently stay in a closed establishment; they are educated under a strict daily regimen and are constantly under their tutors' control; an amount of time they can spend in privacy is minimal, and they socialize only with their classmates [4]. All this makes them fundamentally different from other children and teenagers of the same age who attend other educational establishments with a different structure of social and mental adaptation. Some data reveal that this structure is characterized with significant level of deadaptation in educational and behavioral spheres and emotional ill-being [12, 13].

Given all the above-mentioned, it is necessary to explore neuro-psychic state and life quality of students as well as to detect factors which deteriorate them.

Our research goal was to assess neuro-psychic state and life quality of students who attended an educational establishment with round-the-clock staying.

Data and methods. We performed our research on 536 students who attended an innovative comprehensive educational establishment with round-the-clock staying in Orenburg; students were examined in dynamics from the 5th to the 10th grade and their age was from 12 to 17.

We explored how educational processes were organized in the establishment; our research included determining daily and weekly educational loads, how these loads were distributed over a day and a week, and how school subjects were assigned depending on their complexity over a day and a week taking into account dynamics of students' physiological working capacity. Cadets' daily regimen was assessed on the basis of the daily routine fixed in the establishment; we paid attention to six basic components of any daily regimen, their presence and duration, and their conformity to the existing hygienic requirements. The obtained data were then compared with the Hygienic Requirements 2.4.2.2821–10 "Sanitary-epidemiologic requirements to conditions and organization of an educational process in comprehensive secondary schools" 1.

Children's neuro-psychic state was assessed via questioning. Personal traits were examined by determining an anxiety level and negative emotional experience both in everyday life and during classes. We applied Ch.D. Spielberger's questionnaire, modified by Andreeva (1988). Level of aggression was determined as per Buss-Durkey Inventory (2000) 2, and character traits, as per A.E. Lichko's questionnaire.

1SanPiN 2.4.2.2821-10. Sanitarno-epidemiologicheskie trebovanija k usloviyam i organizatsii obucheniya v obshcheobrazovatel'nykh uchebnyh uchrezhdenijakh (s izmeneniyami na 24 noyabrya 2015 goda): Postanovlenie glavnogo gosudarstvennogo sanitarnogo vracha RF № 189 ot 29.12.2010 g. [HR 2.4.2.2821-10. Sanitary-epidemiologic requirements to conditions and organization of an educational process in comprehensive secondary schools (with the latest alterations adopted on November 24, 2015): The Order by the RF Chief Sanitary Inspector dated December 29, 2010 N 189]. Available at: http://docs.cntd.ru/document/902256369 (18.02.2018) (in Russian).

2Baranov A.A., Kuchma V.R., Sukhareva L.M. [et al]. Otsenka nervno-psikhicheskogo zdorov'ya i psikhofiziologicheskogo statusa detei i podrostkov pri profilakticheskikh meditsinskikh osmotrakh: posobie dlya vrachei [Assessment of neuro-psychic health and psychophysiological state of children and teenagers during prevention medical check-ups: A manual for physician]. Moscow, 2005, 137 p. (in Russian).
classes in mathematics and natural sciences, as well as rotation between "dynamic" classes (sports, technology, music, and art) and "static" ones (basic subjects).

Students' daily regimen also deviated from the fixed standards. Thus, a period of time assigned for doing homework was shorter than the standard by 24.0% for the 5th grade students; by 36.7%, for the 6-7th grade students; by 10.0%, for the 8-9th grade students; by 32.5%, for the 10th grade students. Duration of time spent walking outdoors was shorter than the standard by 73.6% for the 5th grade students; by 58.3%, for the 6-9th grade students; by 50.0%, for the 10th grade students. Night sleep was 10.0% shorter than the standard for the 5th grade students. A period of time assigned for personal hygiene, morning exercises, and breakfast, was 35.0% longer than the standard for the 6-9th grade students; 68.7% longer, for the 10th grade students.

Our assessment of anxiety levels revealed that high anxiety levels during classes were detected in 1.0% of the 9th grade students, but in 23.0% of the 8th grade students; high anxiety levels in everyday life were detected in 7.0% of the 9th grade students, and in 23.0% of the 5th grade students (Table 1).

We assessed a number of students with high anxiety levels in dynamics and detected that there was an increase in number of students who had high anxiety levels during classes, from 16.0% in the 5th grade to 19.0% in the 10th grade. But as for anxiety in everyday life, a number of students with it fell from 23.0% in the 5th grade to 9.0% in the 10th grade. These data prove there are changes in students' emotional state which are probably related to an inadequate reaction of a body to educational loads.
Table 1

Distribution of students depending on anxiety levels in everyday life and during classes (%)

| Anxiety levels | Classes |
|----------------|---------|
|                | 5  | 6  | 7  | 8  | 9  | 10 |
| Low            | 11,5| 17,3| 50,5| 35,5| 54,8| 47,3| 27,1| 33,3| 47,4| 42,1| 4,2| 4,2|
| Average        | 65,4| 66,3| 36,6| 51,6| 33,3| 43,0| 50,0| 43,8| 46,1| 56,6| 86,5| 77,1|
| High           | 23,1| 16,4| 12,9| 12,9| 11,9| 8,6| 21,9| 22,9| 6,5| 1,3| 9,3| 18,7|

Note: 1 is in everyday life; 2 is during classes.

Figure 1. Evidence of negative emotional strain (stress):

|       | a | b |
|-------|---|---|
| Low   | 11,6| 14,2|
| Average| 34,2| 26,3|
| High  | 54,2| 59,5|

High anxiety levels lead to stress occurrence; therefore, 12.0% and 26.0% students were under high stress in everyday life and during classes accordingly (Figure 1).

We examined learning in dynamics and revealed the greatest number of students under high stress level in everyday life in the 8th grade (43 %); under high stress level during classes, in the 6th grade (18.0%) (Table 2).

Stress occurrence, in its turn, led to emergence of aggression in students. We revealed that aggression signs were quite adequate in 50.0% students; 40.0% had them but tried to suppress their aggression; and only 2.0% behaved truly aggressively (Figure 2).

Depending on time spent in the educational establishment, a number of students with adequate signs of aggression went up to 58.8%; levels of aggression remained approximately the same (Table 3).

Table 2

Distribution of students depending on the level of negative psychoemotional strain (stress), %

| Level of negative psychoemotional strain (stress) | Classes |
|-------------------------------------------------|---------|
|                                                 | 6  | 7  | 8  | 9  |
| Low                                             | 1  | 2  | 1  | 2  |
| Average                                         | 46,2| 62,4| 31,2| 63,2|
| High                                            | 17,3| 18,3| 15,0| 13,2|

Note: 1 is in everyday life; 2 is during classes.
As we assessed character accentuation types in students from the 6th - 9th grades, we detected that most of them had a mixed type of character accentuation (from 27.2% in the 8th grade to 38.7% in the 9th grade) (Table 4).

A character accentuation type which could not be diagnosed accounted for a rather high share, 10.7% in the 9th grade, and up to 25.0% in the 7th grade. About 2.0% students in the 7th grade and up to 12.0% students in the 9th grade had hyperthymic character accentuation which is characterized with great willingness to act but also with a tendency to do too much at once and to abandon tasks without completing them. It is important to note that about 6.4% students in the 6th grade and up to 25.0% students in the 7th grade had demonstrative character accentuation; a person with such accentuation type behaves demonstratively, is emotional and vivid, makes contacts easily, strives for leadership, is eager to be recognized and to constantly attract everybody's attention. And here we should also note that 1.9% students in the 8th grade and up to 12.0% in the 7th grade had anxious-pedantic accentuation type, or, in other words, were indecisive, prone to thinking and self-analysis, and susceptible to obsessive fears and thoughts. Other types of character accentuation were rather rare.

Our next examination stage included assessment of life quality and we performed it in order to obtain students' subjective estimations of their health. We detected the highest score (66 scores) for a physical component of health in the 6th grade where students gave a lot of scores to such parameters as "physical..."
functioning" and "role physical functioning"; the lowest score was detected in the 7th grade, where very few scores were given by students to "physical functioning" and "overall health".

The highest scores for a mental component of health (76 scores) were detected in the 6th grade due to "role emotional functioning" and "social functioning"; the lowest scores were detected in the 8th and 9th grade (45 scores) due to "role emotional functioning" and "life activity" in the 8th grade, and "life activity" and "mental health" in the 9th grade.

We performed a correlation analysis and detected that a number of students from various age groups who had high anxiety level grew depending on their overall educational loads ($r = 0.82$), a period of time they spent doing their homework ($r = 0.92$), and a period of time they spent outdoors ($r = -0.83$). Basic life quality parameters changed depending on educational loads during a working day and a week, and it was proved by a detected direct correlation between educational loads and role physical functioning ($r = 0.91$), overall health ($r = 0.91$), social functioning ($r = 0.98$), and role emotional functioning ($r = 0.91$).

So, to sum up, we can conclude, that intra-school environment and organization of educational processes in establishments with round-the-clock staying for students cause risks of negative effects on their neuro-psychic state and overall life quality. Therefore, it is necessary to develop and implement up-to-date preventive and health-preserving activities and practicable programs of medical support for children attending such establishments.

**Funding.** Our research was not granted any sponsors’ support.

**A conflict of interests.** The authors state there is no conflict of interests.

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Peculiarities of neuro-psychic state and life quality of children and teenagers formed under influence exerted by risk factors existing in educational environment.

Setko A.G., Terekhova E.A., Tyurin A.V., Mokeeva M.M. Peculiarities of neuro-psychic state and life quality of children and teenagers formed under influence exerted by risk factors existing in educational environment. Health Risk Analysis, 2018, no. 2, pp. 62–69. DOI: 10.21668/health.risk/2018.2.07.eng

Received: 05.03.2018
Accepted: 01.06.2018
Published: 30.06.2018