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## **Optimization of Medical-Psychological-Pedagogic Support of Children at School**

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*Longitudinal medical-psychological-pedagogic examination of 60 school students (12-13 and 16-17 years of age) helped to establish that 60% of adolescents are characterized by average results of academic activity, which do not significantly change in the process of education and development. Absence of positive dynamics regarding a range of academic activity parameters is observed in 25% of school students in the settings of disabilities; the amount of academic difficulties increases as children grow up in the other 12% of students; this restricts the process of socialization and negatively affects personality development by senior grades. Complex medical-psychological-pedagogic support of adolescents at school helps to prognosticate and, in some cases, timely resolve the existing social problems of growing up of school students; thus, it helps to preserve mental and physical health, as well as to improve social adaptation thereof.*

**Keywords:** *adolescents, medical-psychological-pedagogic examination, academic activity, higher mental functions, social adaptation, preventive pediatrics.*

### **RELEVANCE**

Adolescence (the period from 11 to 17 years of age) is characterized by significant qualitative changes affecting all the aspects of a child's development. Intensive pubertal maturation determines inequality and individual variance of growth and maturity pace. It evokes sexual attraction and new sensations and needs in relation thereto; it also has a dramatic impact on the psychophysiological peculiarities and functional conditions of adolescents [1-5].

Fast psychophysical changes often cause aggravation of the already present medical, psychological, and pedagogical issues that were less apparent at a younger age; meanwhile, new issues arise due to the active development of self-consciousness and entry to the world of adults. Many schoolchildren experience apparent academic difficulties alongside with increasing medical and social issues that include intolerance to people around, bad habits, premature pregnancy etc. Children become less motivated to study, find it more difficult to control themselves; school anxiety increases, and chronic academic underperformance becomes a persistent issue [6-11].

According to the data of the Scientific Center of Children's Health, two out of every three adolescents suffer chronic diseases. In the setting of general health deterioration in high school students, academic difficulties cause personality neurotization, emotional tension somatization, and antisocial mindsets. Besides, children find it increasingly difficult to determine their professional identity [12-16]. This makes it imperative to employ a comprehensive medical, psychological, and pedagogic approach when monitoring the physical and mental health as well as the academic performance of adolescents [17, 18].

### **OBJECT AND METHODS OF RESEARCH**

A longitudinal mixed medical-psychological-pedagogic examination was carried out to study higher mental functions and peculiarities of academic activity of children at the beginning (12-13

years of age) and at the end of adolescence (16-17 years of age). The examination involved 23 boys and 37 girls, i.e. 60 persons in total.

The methods of this study included analysis of medical and pedagogic documents, interviewing, tests, and questioning.

It is known that when a child enters adolescence, his/her academic activities re-develop significantly. Cognitive capacities increase, as verbal and logical thinking is enhanced and mental processes become more arbitrary; self-consciousness develops, and children become more self-sufficient and attach personal sense to the knowledge acquired at the school. Academic motivation becomes complex-structured and combines broad social motives, cognitive interests, and personal values.

The extent of self-sufficiency in terms of academic activities is the most informative criterion of academic development. It depends on the extent to which a student's personal stance and academic skills have been developed so far, on academic motivation and actual achievements in cognitive areas. Another factor is the arbitrariness of cognitive processes and emotional-volitional self-control.

The abovementioned facts have determined the structure, the areas of focus, and the parameters of the psychological-pedagogic study of adolescents' higher mental functions and academic activities:

- intelligence development (Wechsler test for adults adapted by A.Y. Panasyuk);
- sustained attention and work capacity (Toulouse-Piéron test adapted by L.A. Yasyukova);
- self-control and activity (PF Cattell questionnaire adopted for high school students by E.M. Alexandrovskaya and I.N. Gilyasheva);
- vigilance and concentration (Landolt's correction test);
- logical memory capacity (A.N. Leontyev's mediated memorization method);
- M.I. Lukyanova and N.V. Kalinina's academic motivation questionnaire for high school students;
- emotional-volitional self-control and stress resistance ("Man in the Rain" drawing test by E.S. Romanova and T.I. Syt'ko);
- Spielberger-Hanin score of personal and reactive anxiety as adapted by Y.L. Hanin.

Results of the tests were additionally adjusted against the age-adequate ranges:

- 0 points stood for a low level;
- 1 point stood for an average level;
- 2 points stood for a high level.

Statistical processing of the data was performed by means of Microsoft Office Statistica v. 6.0. The data in the text and the tables are presented as absolute numbers and percentage of children with a specific trait. Significance of the acquired data for the groups under comparison was determined by means of the non-parametric chi-square criterion ( $\chi^2$ ). The critical value of significance was taken equal to 5% ( $p < 0.05$ ).

## RESULTS

Follow-up examination of students' health has shown that only 5% of the children under examination could be considered belonging to the first health group both at the beginning and at the end of the secondary school period.

Most adolescents belonged to the second health group (70% of secondary school students and 66.7% of school graduates). 25% of the students belonged to the third health group after finishing primary school, and 28.3% of the students belonged to the third health group after graduation from secondary school. Comparative analysis of medical checkup data has revealed a trend of health deterioration in health groups 2 and 3 by graduation. It is important to note that due to the functional abnormalities of organs and body systems as well as chronic diseases, most students needed to establish and maintain a special physical and academic regimen with due

account of their health peculiarities. However, a comparative analysis of medical and psychological-pedagogic papers has shown that in 62% of the cases psychophysical capacities of the children did not correspond to the requirements stated by adults, i.e. parents and teachers.

Psychological-pedagogic examination of higher mental functions, arbitrariness of emotional-volitional area and academic motivation, as well as self-sufficiency in terms of academic activities provides evidence that most adolescents feature an average or high level of development of the parameters under research as scaled against the age-adequate range. For instance, evaluation of activity and academic self-sufficiency in 12-13-year-old children revealed high figures in 57.5% of girls and 33.3% of boys. By the end of studying at secondary school, the tendency persisted in 48.5% of girls and 25.9% of boys; no significant gender discrepancies were identified.

Meanwhile, as graduates become more mentally mature, they start featuring an increasing number of social and emotional issues, including worsened mood, limited social interactions etc. One of the causes is that the bar of social requirements and expectations that an adolescent has to comply with is raised dramatically.

When examining the emotional sphere of adolescents by means of Spielberger-Hanin personal and reactive anxiety score, it was found out that among 12-13-year-old adolescents 51.5% of girls and 55.5% of boys had average and high values of those parameters.

The so-called "Man in the Rain" technique allows checking emotional-volitional self-control of an adolescent, as well as their skills of dealing with difficulties. It has shown that by the start of puberty, the average test results are approximately equal in boys and girls (66.7% and 77.8%, respectively). However, 3% of girls and 11.1% of boys tend to have inflexible behavioral patterns and experience difficulties when dealing with conflicts.

Gender inequality has been identified when studying the peculiarities of higher mental function formation in children.

For instance, 45.4% of girls and 18.5% of boys have increased Wechsler test values ( $p > 0.05$ ). Retardation is diagnosed in 6.1% of girls and 3.7% of boys.

Examination of sustained attention and work capacity by means of the Toulouse-Pieron test confirms that boys of both age groups (66.7% and 74.1%, respectively) tend to have average results, whereas girls after both primary and secondary school tend to have high results (57.5%).

A.N. Leontyev's mediated memorization method, which allows diagnosing logical memory capacity, has indicated prevalence of average values in girls (78.1%) and boys (70.4%). The re-examination undergone at the age of 16-17 years showed that the number of schoolchildren with low test results tends to increase regardless of sex (especially in girls, though). However, the portion of children with high results remains practically unchanged.

N.V. Kalinina and M.I. Lukynova's Academic Motivation Questionnaire was used to study such motivation in younger and older adolescents only to find out that this value was average in most students.

The fact that more and more children experience academic difficulties when entering high school and have lower mental test results as compared to their age peers may be a sign that personal psychophysical capacities are not considered properly when organizing the curriculum [4].

Analysis of academic activities of the adolescents experiencing difficulties revealed that they are often correlated to limited health capacities. Increased activity and academic self-sufficiency observed in the 1<sup>st</sup> and the 2<sup>nd</sup> health group children throughout the whole examination was not identified in the 3<sup>rd</sup> health group children (Fig. 1). Apart from that, low academic motivation and increased anxiety are indicative of children with limited health capacities (Figs. 2 and 3).

## DISCUSSION

Results of the examination prove that comprehensive approach is imperative when monitoring students' health status as well as the organization of educational processes. As there is no personal approach to the education of children with limited health capacities that account for a quarter of children under examination, academic difficulties are aggravated, adaptation

mechanisms are depleted, and excessive academic load has an extremely negative impact on the children's psychoemotional condition.

Analysis of the data obtained by means of the comprehensive psychological-pedagogic examination has shown presence of gender inequality in terms of academic activities.

Girls of both age groups have a greater level of sustained attention development. The same statement applies to their work capacity, and monotonous activities requiring sustained attention. Low concentration capabilities have only been identified in boys. At the age of 16 to 17 years, low test results were only registered among boys and accounted for 14.8% of all cases.

Girls are better motivated to perform academic activities (cf. 30.3% motivation level in girls to 18.5% in boys) and tend to be more anxious (cf. 36.4% to 7.4%), which may indicate both CNS functioning discrepancies and formed gender-based mindsets in relation to academic activities [19]. When analyzing academic performance based on annual marks, girls have been found out to have better knowledge of humanities and aesthetics, whilst boys tend to be more knowledgeable about exact and natural sciences.

The acquired data may indicate that when examining the academic activities of adolescents as a part of medical-psychological-pedagogic support, sex should also be taken into account alongside with age and health of a student.

Thus, the comprehensive longitudinal medical-psychological-pedagogic examination has helped to identify peculiarities of higher mental function formation and academic activities. It has been established that 60% of adolescents are characterized by average results of academic activity, which do not significantly change in the process of education and development. However, more than 5% of younger children and 12% of their older counterparts have a low level of all the parameters under research, which is manifested with limited concentration and sustained attention capabilities, low quality cognitive activities, as well as immaturity of emotions and motivations of personality [7]. Most adolescents who experienced academic difficulties also had functional or chronic disorders. The difficulties are as follows: low academic self-sufficiency accompanied by insufficient volition, underdevelopment of cognitive processes, poor academic motivation, and increased anxiety level. Absence of positive dynamics regarding a range of academic activity parameters is observed in 25% of schoolchildren. This fact and the number of children with academic difficulties increasing by senior grades indicates that adults do not give appropriate attention to the personal psychophysical capacities of children, especially to their health status, age-based and gender-based peculiarities, in the process of organization and implementation of educational processes.

Comprehensive medical-psychological-pedagogic support of adolescents at school helps to

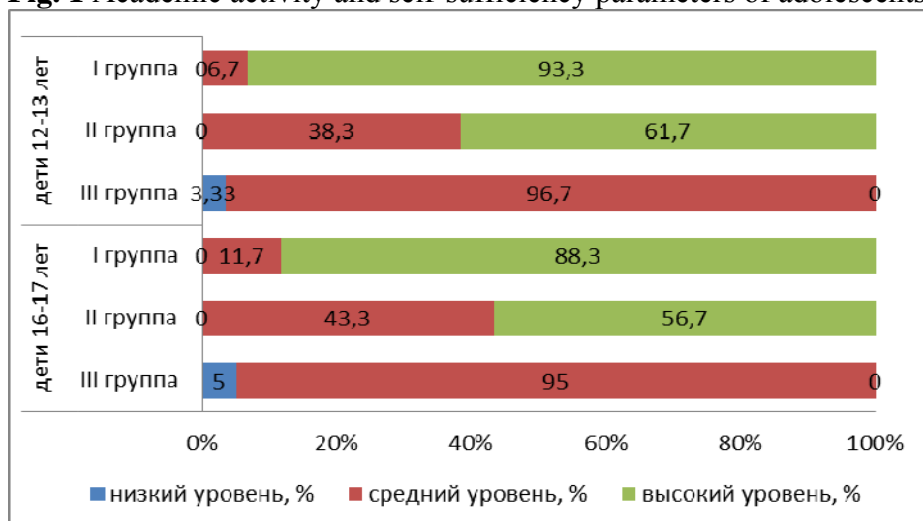
prognosticate and, in some cases, resolve the existing social problems of growing-up of school students in time; thus, it helps to preserve mental and physical health, as well as to improve social adaptation thereof.

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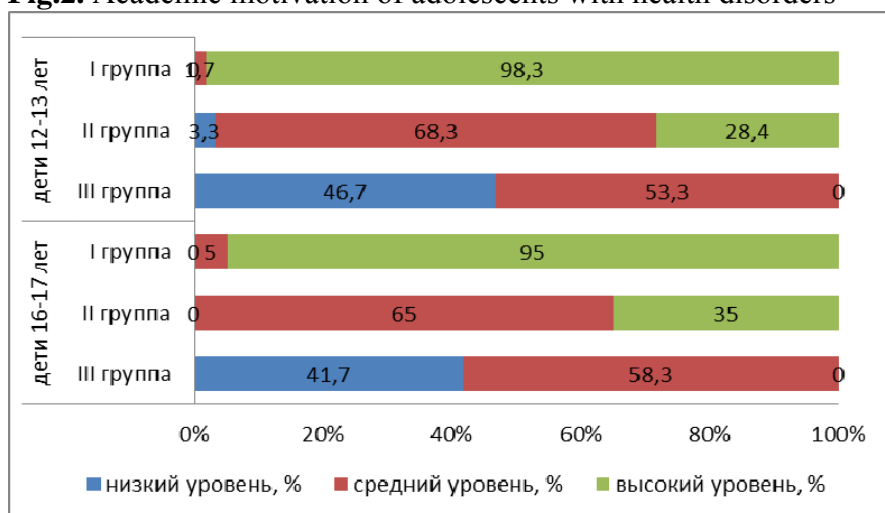
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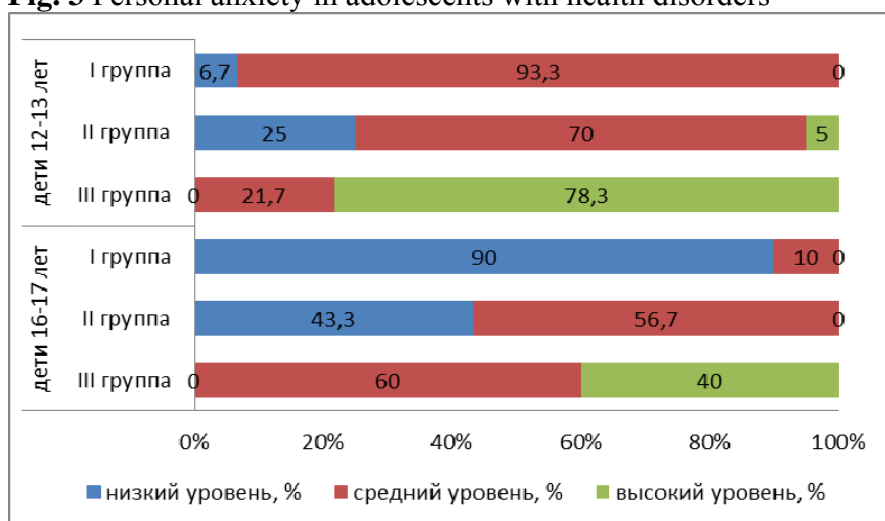
**Fig. 1** Academic activity and self-sufficiency parameters of adolescents with health disorders



**Fig.2.** Academic motivation of adolescents with health disorders



**Fig. 3** Personal anxiety in adolescents with health disorders



## RUSSIAN

I группа

II группа

III группа

Дети 12-13 лет

Дети 16-17 лет

Низкий уровень

Средний уровень

Высокий уровень

## ENGLISH

Group I

Group II

Group III

Children aged 12-13 years

Children aged 16-17 years

Low level

Average level

High level