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**PECULIARITIES OF PSYCHOSOMATIC HEALTH FORMATION
IN ADOLESCENT BOYS**

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Abstract

Poor mental and somatic health of adolescents is a crucial issue. Comprehensive studies on the laws governing formation of children health during school years is relevant. The purpose of the article is to study psychological characteristics and functional parameters of the cardiovascular system in adolescent boys. 430 Magadan boys aged 13–17 years were examined. 80 adolescents took part in the study of psychological indicators taking into account alexithymic traits. Alexithymia levels were determined using the Toronto alexithymic scale (TAS-26). The alexithymic personality type was diagnosed in 25 boys; the transitional type was diagnosed in 27 boys; the non-alexithymic type was diagnosed in 28 boys. The data were analyzed for alexithymic and non-alexithymic adolescents. The structure of anxiety was determined by the method of multidimensional assessment of child anxiety, the types of character accentuations were identified using the Leonhard-Shmishchek questionnaire. The indicators of cardiohemodynamics were determined at rest (sitting) by the method of volumetric compression oscillometry based on the central hemodynamics (Globus, Belgorod). Direct and calculated parameters of central and peripheral hemodynamics were recorded: systolic and diastolic blood pressure, heart rates, types of blood circulation self-regulation. The study showed significant differences in anxiety indicators in adolescent boys with alexithymic traits. They have more pronounced indicators of anxiety, psychophysiological and psycho-vegetative reactions, dysthymic and exalted characteristics. The predominant type of blood circulation self-regulation is cardiac, which indicates reduced reserve capacities of the cardiovascular system. The combination of anxiety and accentuations in adolescents with alexithymia can affect school adaptation.

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Keywords: Adolescents, alexithymia, cardiovascular system, North.



1. Introduction

Studies of the health status of children and adolescents indicate the presence of regional features determined by climatic, environmental, and social environmental factors (Povargo et al., 2014). Literature data emphasize an increase in the neuropsychiatric disorders in adolescents due to borderline neurotic and personality disorders (Agarkov, Skorokhodova, & Pogorelova, 2011). In adolescence, ontogeny is particularly sensitive to various adverse environmental factors influencing the cardiovascular system (Pankova, Alchinova, Cherepov, & Karganov, 2008; Grechkina, 2016). Therefore, the problem is poor mental and somatic health of adolescents manifested in psychopathological disorders and premorbid deviations (Baranov, Namazova-Baranova, Albitsky, Terletsкая, & Antonova, 2014).

A comprehensive study of the patterns of health formation, studies on psycho-physiological and morphofunctional development of children is one of the priority research areas in the field of age physiology, child and adolescent health (Mukatayeva, 2010; Baranov et al., 2014).

One of the psychological risk factors for psychosomatic disorders, behavioral disorders and addiction is alexithymia which can be expressed in the personality structure of healthy people (Baiardini, Abbà, & Ballauri 2011). Alexithymia involves difficulties in distinguishing between emotions and body sensations, understanding feelings of other people (Sifneos, 1973). Individuals with alexithymia are prone to somatic complaints and mental disorders (Taylor, Bagby, & Parker, 1997; De Gucht & Heiser, 2003; Arruda & Bigal, 2012; Li, Zhang, Guo, & Zhang, 2015). Alexithymia develops in male adolescents (Levant, Hall, & Williams, 2009) and is typical of middle-aged men with cardiovascular pathology (Kauhanen, Kaplan, & Cohen, 1996). Among the factors influencing the development of psychosomatic pathologies of the male cardiovascular system, alexithymia and anxiety play active roles (Vinokur & Simanekov, 2002). Growing alexithymia contributes to the fact that high anxiety has psychosomatic symptoms and is a mechanism of development of cardiovascular diseases (Vinokur & Simanekov, 2002). Adolescents with somatoform disorders have higher levels of alexithymia and anxiety (Burba, Oswald, Grigaliunienė, Neverauskiene, & Jankuviene, 2006). Alexithymic adolescents are characterized by more pronounced indicators of anxiety, social frustration and mental rigidity (Bartosh, Bartosh, & Mychko, 2018). Disturbance of neuropsychic adaptation affects the development of accentuated character traits (Leonhard, 1997). Along with alexithymia, character accentuations develop in 50-80% of boys. Character accentuation and alexithymia can be consequences of heredity or child rearing (Zhilina, 2008; Baughman, Schermer, Veselka, Harris, & Vernon, 2013). Accentuation can serve as a background for the development of borderline mental disorders and psychosomatic diseases (Cloninger, Bayon, & Svrakic, 1998; Leonhard, 1997).

The cardiovascular system of adolescents is particularly sensitive to the environmental factors, physical and mental activities (Krivoschekov & Grebneva, 2000; Mikhailova & Kimyaeva, 2013).

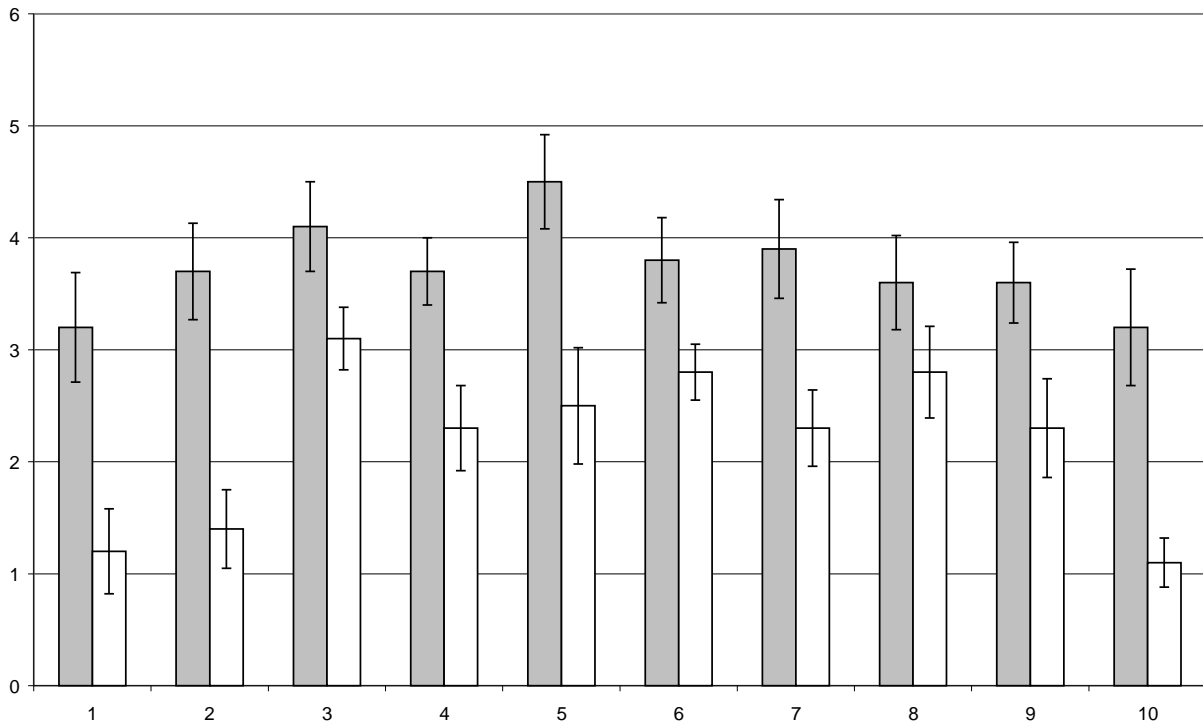


Figure 01. The structure of anxiety in adolescents with different levels of alexithymia

the data for the alexithymic type of boys are grey; the data for the non-alexithymic type are white
 1.– general anxiety; 2.– anxiety in relationships with peers; 3.– anxiety when assessing others; 4.– anxiety in relationships with teachers; 5.– anxiety in relationships with parents; 6. - anxiety associated with success in learning; 7. - anxiety arising in situations of self-expression; 8.– anxiety arising in situations of testing knowledge; 9. - decrease in mental activity associated with anxiety; 10. - increased vegetative reactivity associated with anxiety.

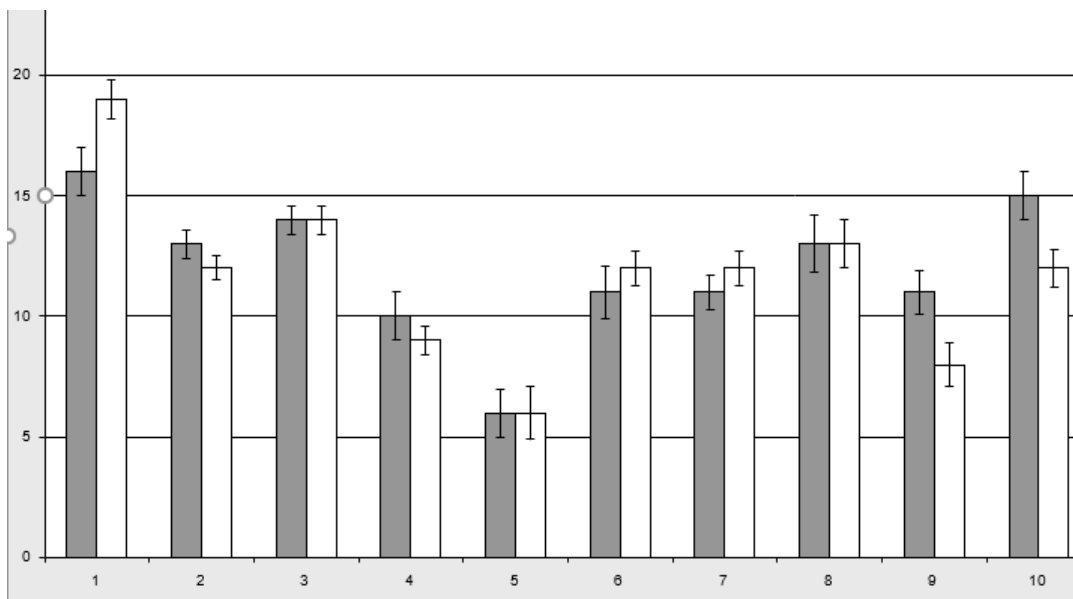


Figure 02. The profile of accentuation in boys with different levels of alexithymia
 1 - hyperthymic, 2 - stuck, 3 - emotive, 4 - pedantic, 5 - alarming, 6 - cyclotyme, 7 - demonstrative, 8 - excitable, 9 - distracting, 10 - exalted

2. Problem Statement

In the northern conditions, the body of adolescents is affected by large psycho-physiological stresses associated with schooling and physical exertion in physical education classes and during sports training and competitions (Grechkina, 2016). Therefore, self-regulation of blood circulation and psychological health of northern adolescent with different levels of alexithymia are crucial issues.

3. Research Questions

The article aims to study the structure of anxiety and accentuations in boys with different levels of alexithymia, and predominant types of self-regulation of blood circulation in order to determine functional reserves of the growing organism in the northern conditions.

4. Purpose of the Study

The purpose of the article is to study psychological characteristics and functional parameters of the cardiovascular system in adolescent boys.

5. Research Methods

430 male teenagers aged 13–17 years (students of three Magadan schools) were examined. 80 boys took part in the study of psychological indicators taking into account alexithymic features. To assess alexithymia, the Toronto alexithymic scale (TAS-26) adapted by the Psychoneurological Institute named after V.M. Bekhterev was used. Based on the TAS-26 scale, an alexithymic personality type (74 points and above) was identified in 25 boys; a transitional type (63–73 points) was identified in 27 individuals; a non-alexithymic personality type (62 points and below) was identified in 28 boys. The data obtained were analyzed. The structure of anxiety was determined using the Multidimensional Evaluation of Child Anxiety (MECA) (Romitsyna, 2006) whose structure includes 10 scales: 1 - general anxiety; 2 - anxiety in relationships with peers; 3 - anxiety in relationships with the environment; 4 - anxiety in relationships with teachers; 5 - anxiety in relationships with parents; 6 - anxiety associated with schooling; 7 - anxiety arising in situations of self-expression; 8 - anxiety arising in situations of testing knowledge; 9 - a decrease in mental activity associated with anxiety; 10 – an increase in autonomic reactivity associated with anxiety. The total score was 0-10 points. If the parameter gained 1-2 points, the quality is not pronounced, 4-5 points - clearly pronounced. To determine the types of character accentuations, a characterological questionnaire developed by Leonhard and Shmishek was used. The questionnaire contains 88 questions on 10 scales and diagnoses types of accentuations. If the trait has 18 or more points, it is accentuated (Vinokur & Simanenkova, 2002). Indicators of cardiohemodynamics were determined at rest (sitting) by the method of volumetric compression oscillometry based on the central hemodynamics (Globus, Belgorod). Direct and calculated parameters of central and peripheral hemodynamics were recorded: systolic and diastolic blood pressure (BP, mmHg), heart rate (HR, beats./min), type of blood circulation self-regulation (TBCSR). The survey was conducted at school according to the Helsinki Declaration approved by the Regional Ethical Committee of Biomedical Research (protocol No. 3 of December 4, 2013). Statistical data were processed

in Microsoft Excel 2002 and Statista-6.0. The average values of indicators (M) and their standard errors ($\pm m$) were calculated. The statistical significance of differences was assessed by Student's t-test for independent samples provided that the distribution was normal. The difference level was considered statistically significant at $p \leq 0.05$.

6. Findings

The study showed that 31% of the adolescents had alexithymic traits. No alexithymic traits were found in 35% of adolescents, 34% of adolescents were classified as transitional. Figure 1 shows that the overall anxiety profile of boys with alexithymic traits significantly ($p < 0.05$) exceeds the profile of peers lacking alexithymic traits. There are no differences only on scale 8 - anxiety when testing knowledge. Peak manifestations of anxiety are on scales 5 - anxiety in relationships with parents and 3 - anxiety in relationships with the environment. Increased anxiety in relations with parents speaks about tension and insecurity. This may affect social adaptation and learning. Such adolescents are quite sensitive to the opinions of other people (Romitsyna, 2006). They have more pronounced psycho-physiological and psycho-vegetative reactions in stress situations (scales 9 and 10) ($p < 0.05$). Figure 2 shows the indicators of character accentuations in adolescents. The study showed that boys with alexithymic traits have more pronounced ($p < 0.05$) features of dysthymic and exalted types. Moreover, among the alexithymic boys, the exalted type is expressed in 48%. They are pessimistic, deeply react to individual events, are characterized by sharp mood swings (Leonhard, 1997). A positive correlation between the index of alexithymia and dysthymic ($r = 0.31$, $p < 0.05$) and exalted ($r = 0.22$, $p < 0.05$) types of accentuations was identified. In non-alexithymic boys, the average indicator of hyperthymic accentuation was higher exceeding the norm. It was more pronounced ($p < 0.05$). They are more active, sociable. The study showed that only 78% of all adolescents had normal blood pressure indicators. In 11% of adolescents, the values of blood pressure indicators were close to the upper limit of the norm - "high norm", and in 11%, increased arterial pressure - "hypertension" was recorded. By the age of 16-17, the share of boys with normal values of blood pressure indicators decreases. In 16-year old boys, there is a significant share of boys with "high" blood pressure indicators (up to 13%) and an increase in the share of people with "hypertension" (22%). Analysis of the heart rate showed that 74% of the adolescents had values corresponding to the age limit. Tachycardia was diagnosed in 16% of schoolchildren, and bradycardia - in 10%. In 16-year-olds, the share of people with tachycardia decreases while the share of people with bradycardia increases. One of the informative indicators reflecting phenotypic characteristics of the body is the type of self-regulation of blood circulation which allows for assessing the level of tension in the regulation of the cardiovascular system. The change in blood circulation self-regulation indicates an increase in the functional reserves of the vascular system to ensure long-term adaptation. The change in blood circulation self-regulation towards the heart component indicates adaptation to the short-term effects of disturbing environmental factors. The TBCSR reflects the most balanced self-regulation of the circulatory system. Middle-aged values of TBCSR indicators indicate that the cardiac TBCSR is characteristic of 15-year-olds, while the cardiovascular TBCSR is characteristic of 16-17-year-old adolescents. However, the predominant type of blood circulation self-regulation is cardiac which indicates intensity of the cardiovascular system in Magadan adolescents (Grechkina, 2016).

7. Conclusion

Thus, the study showed significant differences in anxiety indices of adolescent boys with alexithymic traits. They have more pronounced indicators of anxiety, psycho-physiological and psycho-vegetative reactions. Among them, there are a lot of representatives of dysthymic and exalted types. The predominant type of self-regulation of blood circulation is cardiac which indicates reduced reserve capacities of the cardiovascular system. The combination of anxiety and character accentuation in adolescents with alexithymia influenced by climatic and psychosocial factors can decrease functional reserves of the growing organism, affect school adaptation and cause psychosomatic disorders. It is necessary to determine the levels in the personality structure. The type of blood circulation self-regulation and the ability of the body to respond to physical and mental loads should be taken into account.

References

- Agarkov, A. A., Skorokhodova, T. F., & Pogorelova, T. V. (2011). Risk factors for mental disorders in adolescents of conscription and draft age. *Siberian Bulletin of Psychiatry and Narcology*, 4, 61–64.
- Arruda, M. A., & Bigal, M. E. (2012). Behavioral and emotional symptoms and primary headaches in children: a population-based study. *Cephalalgia*, 32, 1093–1100. <http://dx.doi.org/10.1177/0333102412454226>
- Baiardini, I., Abbà, S., & Ballauri, M. (2011). Alexithymia and chronic diseases: the state of the art. *Ital. Med. Lav. Erg. Suppl. A., Psychol*, 33(1), 47–52.
- Baranov, A. A., Namazova-Baranova, L. S., Albitsky, V. Yu., Terletskaia, R. N., & Antonova, E. V. (2014). Condition and health problems of adolescents in Russia. *Problems of social health hygiene and medical history*, 6, 10–14.
- Bartosh, T. P., Bartosh, O. P., & Mychko, M. V. (2018). Psychological profiles of alexithymic adolescent boys of Magadan. *Mental Health of Children and Adolescent*, 1, 65–71.
- Baughman, H. M., Schermer, J. A., Veselka, L., Harris, J., & Vernon, P. A. (2013). A behavior genetic analysis of trait emotional intelligence and alexithymia: a replication. *Twin Res. Hum. Genet*, 16, 554–559. <http://dx.doi.org/10.1017/thg.2012.151>
- Burba, B., Oswald, R., Grigaliunien, V., Neverauskiene, S., & Jankuviene, O. (2006). A controlled study of alexithymia in adolescent patients with persistent somatoform pain disorder. *Psychiatry*, 51, 468–471. <http://dx.doi.org/10.1177/070674370605100709>
- Cloninger, C. R., Bayon, C., & Svrakic, D. M. (1998). Measurement of temperament and character in mood disorders: a model of fundamental states as personality types. *Journal of Affective Disorders*, 51(1), 21–32. [http://dx.doi.org/10.1016/S0165-0327\(98\)00153-0](http://dx.doi.org/10.1016/S0165-0327(98)00153-0)
- De Gucht, V., & Heiser, W. (2003). Alexithymia and somatisation: A quantitative review of the literature. *J. Psychosom. Res.*, 54, 425–434.
- Grechkina, L. I. (2016). The prenosological characteristics of hemodynamic parameters demonstrated by male adolescents, born in the city of Magadan, having different types of self-regulation of the circulation. *Population health and life environment*, 1(274), 22–26.
- Kauhanen, J., Kaplan, G. A., & Cohen, R. D. (1996). Alexithymia and risk of death in middle-aged men. *J. Psychosom. Res*, 41(6), 541–549.
- Krivoschekov, S. G., & Grebneva, N. N. (2000). Characteristic morphological features and functional state of the body of adolescents in terms of adaptation to the North. *Human physiology*, 26(2), 93–98.
- Leonhard, K. (1997). *Accentuated personality*. Rostov-on-Don: Phoenix.
- Levant, R. F., Hall, R. J., & Williams, Ch. M. (2009). Gender Differences in Alexithymia. *Psychology of Men & Masculinity*, 10(3), 190–203.

- Li, S., Zhang, B., Guo, Y., & Zhang J. (2015). The association between alexithymia as assessed by the 20-item toronto alexithymia scale and depression: a meta-analysis. *Psychiatry*, 227, 1–9. <http://dx.doi.org/10.1016/j.psychres.2015.02.006>
- Mikhailova, L. A., & Kimyaeva, S. I. (2013). Indicators of central hemodynamics in high school students who have increased training and motor loads. *Siberian Medical Review*, 3, 55–58.
- Mukatayeva, J. M. (2010). *Morphofunctional and psychophysiological features of the development of children and adolescents: monograph*. Pavlodar.
- Pankova, N. B., Alchinova, I. B., Cherepov, A. B., & Karganov, M. Yu. (2008). Regional features of cardiovascular functional parameters in adolescents. *Russian pediatric journal*, 1, 37–42.
- Povargo, E. A., Zulkarnayeva, A. T., Zulkarnayev, T. R., Ovsyannikova, L. B., Agafonov, A. I., & Akhmetshina, R. A. (2014). Regional features of the physical development of Ufa schoolchildren. *Hygiene and Sanitation*, 4, 72–74.
- Romitsyna, E. E. (2006). *Multidimensional Estimation of Child Anxiety. Educational Learning Guide*. St. Petersburg: Rech.
- Sifneos, P. E. (1973). The prevalence of “alexithymic” characteristics in psychosomatic patients. *Psychotherapy and Psychosomatics*, 22, 255–262.
- Taylor, G. J., Bagby, R. M., & Parker, J. D. (1997). *Disorders of affect regulation: Alexithymia in medical and psychiatric illness*. Cambridge: Cambridge University Press.
- Vinokur, V. A., & Simanenkova V. I. (2002). Psychosomatic mechanisms of participation of alexithymia in the development of diseases of the cardiovascular system. *Journal of Experimental and Clinical Psychology*, 1, 56–60.
- Zhilina, E. V. (2008). Genotypic and environmental determinants of character accentuation. *Izvestia of the Russian State Pedagogical University named after A.I. Herzen*, 26(60), 369–377.