The interdependence between regulatory functions and health attitudes in preschool children, characterized by varying degrees of involvement in organized motor activity

UDC 159.91+ 371.72+ 797.2

Senior lecturer **E.V. Dobrina**
Dr. Hab., Professor **E.N. Gerasimova**
Bunin Yelets State University

Corresponding author: dobrina_katya85@mail.ru

Received by the editorial office on 11.11.2024

Abstract

Objective of the study aims to establish a correlation between the development of executive functions and the perception of health by children aged 5-6 years engaged in organized and unorganized motor activity.

Methods and structure of the study. In the course of the work, 100 children aged 5 to 6 years were examined. Of these, 45 attended kindergarten and various sports clubs, forming a group with organized physical activity. The remaining 55 children did not attend kindergarten or sports clubs, representing a group with disorganized motor activity. To assess the attitude to health, an adapted questionnaire was used by R.A. Berezovskaya Street, where certain formulations were adjusted to take into account age, for example, "Happy family life" was transformed into "Good relations with parents", and "Interesting work, career" – into "Successful studies at school". The study of executive functions included an assessment of sensorimotor integration using the ReBOS technique, which makes it possible to evaluate the characteristics of simple and complex sensorimotor reactions.

Results and conclusions. The analysis of the results revealed a five-factor structure. The first factor, which explains 29.8% of the variance of the trait, is most closely related to the parameters of motor activity, attitude to health and executive functions. Regression analysis demonstrated the relationship between executive functions, in particular, the parameters of simple and complex sensorimotor reactions, and various aspects of the attitude to health in older preschool children. Thus, regular motor activity is associated with the peculiarities of health perception and physiological manifestations of selective behavior in older preschoolers.

Keywords: *perception of health, organized motor activity, unorganized motor activity, assessment of attitude to health, sensorimotor integration.*

Introduction. One of the priorities of the modern education system is to preserve and strengthen children's health. At the same time, the greatest emphasis is placed on preschoolers, since it is at this age that the intensive formation of both the child's body itself and the mechanisms of neurohumoral regulation that ensure the preservation of health takes place [9]. It is known that one of the key roles in the process of both physical and mental development of a child is played by physical activity [12], since its optimal level allows maintaining the body's adaptive reserves in a state in which the body remains highly resistant to various adverse factors, which determines the child's level of health [1].

To date, there is evidence that sufficient physical activity has an impact on the child's health, namely, the more active the child is, the better the condition of the cardiovascular and musculoskeletal systems. It is known that the more active a child is in childhood, the better his condition in adulthood, in particular childhood obesity, one of the causes of which is physical inactivity, is a predisposing factor for many diseases of adulthood. Finally, behaviors in which motor activity plays a key role may persist into adulthood, making active children more likely to become more active (healthy) adults [8].

In turn, one of the markers of the functional state is executive functions (behavioral change functions) and, in particular, sensorimotor integration, the characteristics of which, manifested in sensorimotor reactions, are associated with the features of the functional state of the central nervous system [7] and with the level of motor activity [4].

At the same time, speaking about the promotion of

children's health, it should be noted that today one of the key components of health-saving behavior is the attitude to health [2], which begins to form at the earliest stages of ontogenesis [10], primarily under the influence of the characteristics of motor activity [11].

Objective of the study aims to establish a correlation between the development of executive functions and the perception of health by children aged 5-6 years engaged in organized and unorganized motor activity.

Methods and structure of the study. 100 children aged 5-6 years were examined, of which: 45 children attend kindergarten, as well as various sports sections – a group of children with organized motor activity; 55 do not attend kindergarten and any sports sections – a group of children with disorganized motor activity.

The peculiarities of attitudes to health were studied using an adapted version of the questionnaire "Attitudes to health" (R.A. Berezovskaya) in which some statements were specified, for example: "Happy family life" was replaced by "Good relations with parents"; "Interesting job, career" by "Successful studies at school" and so on [3, 6].

The study of executive functions included the study of sensorimotor integration using the ReBOS technique, which makes it possible to evaluate the features of simple and complex sensorimotor reactions [5].

Results and conclusions. The first stage was a factor analysis of the studied parameters, which showed that five factors can be distinguished, among which the first factor with the highest weight includes the following parameters: organized motor activity (0.724), the level of the behavioral component of the OcD (-0.308) and the components of executive functions (average time of the 1st (0.840) and 2nd (0.833) parts of a simple sensorimotor reaction, the average time of the 1st (0.733) and 2nd (0.711) parts of a complex sensorimotor reaction, the accuracy of a simple sensorimotor reaction (-0.837)).

This factor explains 29.8% of the variance of the trait, therefore, the connection of organized motor activity with the physiological manifestations of selective behavior is one of the foundations for the formation of a child's health-preserving behavior.

The second factor indicates the relationship between the level of attitude to health and the quality of a simple sensorimotor reaction (explains 16.1% of the variance), the third factor shows the relationship between the level of the cognitive component of OcD and the accuracy of a complex sensorimotor reaction (explains 11.1% of the variance). The fourth factor includes the parameters of the sensorimotor reaction (explains 7.5% of the variance), and the fifth factor includes the components of the attitude to health in children (explains 7.3% of the variance).

Having discovered the relationship between the studied parameters, we conducted a regression analysis in order to establish the features of this relationship, separately in a group of children engaged in organized motor activity and not. It was revealed that in the group of engaged children, the independent variable "accuracy of a simple sensorimotor reaction" affects the dependent variable "level of the emotional component" (R=-0.560, R2=0.314, at p=0.019).

It is shown that 31.4% of the level of the emotional component is explained by the peculiarities of the accuracy of a simple sensorimotor reaction. At the same time, the correlation coefficient shows the inverse relationship of these parameters – the higher the accuracy, the lower the level of the emotional component of the attitude to health in children.

In turn, in the group of children who do not engage in organized motor activity, 23.6% of the emotional component of the attitude to health is explained by the accuracy of a complex sensorimotor reaction. We have established the influence of the independent variable "accuracy of complex sensorimotor reaction" on the dependent variable "level of the emotional component of the attitude to health, (R=0.485, R2=0.236, at p=0.012) in this group of children. However, the correlation of the studied parameters is positive. This suggests that the more precise the complex sensorimotor response, the higher the emotional component of the attitude to health in children.

The data we obtained showed that engaging in organized motor activity is associated with the peculiarities of executive functions, namely, simple and complex sensorimotor reactions. It can be concluded that specially organized motor activity associated with complex spatial orientation contributes to the fact that children acquire the ability to perceive the surrounding reality more effectively during classes in various sports sections related to motor activity, which manifests itself in a more effective sensorimotor response. At the same time, the negative correlation coefficient of the parameters of the attitude to health according to the results of factor analysis, where the behavioral component was included in the same factor as those engaged in organized motor activity, indicates that children who have an active lifestyle think less about maintaining and strengthening their health, since they are less ill and thus do not feel the need for formation of behavior aimed at overcoming the disease [8].

In turn, the negative relationship between the parameters of sensorimotor response and the compo-

nents of the attitude to health and, in particular, with the emotional component, identified in a group of children engaged in motor activity, indicates that executive functions that control changes in health-promoting behavior in this group of children suppress the need to actualize behavior to preserve and strengthen. The data obtained are consistent with studies that show that the active lifestyle of preschoolers who regularly engage in organized physical activity increases the body's resistance to various diseases, as a result of which they are less likely to get sick and, consequently, less likely to experience emotional reactions associated with health problems [1, 9, 12].

At the same time, in the group of children who do not engage in organized motor activity, a direct relationship between sensorimotor response and the level of the emotional component of the attitude to health was found. In our opinion, this is due to the fact that in this group of preschoolers, children are more likely to get sick, and it is the negative experience of illness that actualizes emotional reactions associated with loss of health. This leads to the need for a more accurate perception of the surrounding reality by the child, in order to actualize mechanisms aimed at preventing disease in the future, and as a result, maintaining and strengthening health.

Conclusions. A five-factor model of the relationship between the studied parameters is revealed. At the same time, the first factor, which explains the largest percentage of the variance of the studied features – 29.8%, included the parameters of motor activity, the behavioral component of OcD and the parameters of executive functions with a high weight. The peculiarities of the attitude to health are related to the physiological manifestations of selective behavior, namely, executive functions both in the group of children with organized motor activity and in the group of children without it. The study was carried out with the financial support of the I.A. Bunin YSU.

References

1. Ablyaeva A.V. Vliyanie fizicheskoj aktivnosti na funkcionalnoe sostoyanie organizma podrostkov. Mezhdunarodnyj nauchno-issledovatelskij zhurnal. 2022. No. 11 (125). URL: https://research-journal.org/archive/11-125-2022-november/10.23670/IRJ.2022.125.4 (data obrashcheniya: 26.11.2024). DOI: 10.23670/IRJ.2022.125.4
2. Arina G.A., Iosifyan M.A., Nikolaeva V.V. Kulturno-istoricheskij podhod k vnutrennej kartine zdorovya: fenomeny, struktura, ontogenez. Rukovodstvo po psihologii zdorovya. M.: Izd-vo Moskovskogo universiteta, 2019. P. 56–102.
3. Berezovskaya R.A. Issledovaniya otnosheniya k zdorovyu: sovremennoe sostoyanie problemy v otechestvennoj psihologii. Vestnik Sankt-Peterburgskogo universiteta. Seriya 12. Psihologiya. Sociologiya. Pedagogika. 2011. No. 1. P. 221–226.
4. Nekhoroshkova A.N., Gribanov A.V., Deputat I.S. Sensomotornye reakcii v psihofiziologicheskih issledovaniyah (obzor). Zhurnal mediko-biologicheskih issledovanij. 2015. No. 1. P. 38-48.
5. Nikolaeva E.I., Vergunov E.G. Prognoz psihofiziologicheskoj «stoimosti» effektivnosti processa obucheniya u starshih shkolnikov. Psihologiya obrazovaniya v polikulturnom prostranstve. 2013. T. 1. No. 21. P. 47–52.
6. Ruslyakova E.E. Otnoshenie k zdorovyu i vnutrennyaya kartina zdorovya shkolnikov. Mir nauki. Pedagogika i psihologiya. 2015. No. 3. P. 43.
7. Shutova S.V., Muraveva I.V. Sensomotornye reakcii kak harakteristika funkcionalnogo sostoyaniya CNS. Vestnik rossijskih universitetov. Matematika. 2013. № 5-3. S. 2831- 2840. Boreham C., Riddoch C. The physical activity, fitness and health of children. Journal of Sports Sciences. 2001. No. 19 (12). P. 915–929. https://doi.org/10.1080/026404101317108426
8. Kolesnyk A., Barna C., Kashuba L., Biriukova T., Rudenko T., Khrabra S. The Neurovegetative Status of Children 5-7 Years Old. BRAIN. Broad Research in Artificial Intelligence and Neuroscience. 2022. No. 13. pp. 421-435. 10.18662/brain/13.4/396
9. Marks D., Murray M., Estacio E. Health Psychology. Theory, re¬search, practice. Fifth edition. 2018. 832 p.
10. Ruedl G., Cocca A., Wirnitzer K.C., Tanous D., Drenowatz C., Niedermeier M. Primary school childrens health and its association with physical fitness development and health-related factors[J] // AIMS Public Health. 2024. No. 11(1). pp.1-18. https://doi.org/10.3934/publichealth.2024001
11. Sando O.J., Mehus I. Supportive indoor environments for functional play in ECEC institutions: a strategy for promoting well-being and physical activity? Early Child Development and Care. 2019. No. 191(6). pp.921–932. https://doi.org/10.1080/03004430.2019.1651305.