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Article /Review

FACTORS AFFECTING THE PSYCHOMOTOR DEVELOPMENT OF CHILDREN: PROSPECTS FOR AN INTERDISCIPLINARY APPROACH

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Abstract. Today, one of the pressing issues for modern society is the fight against risk factors for the development of non-communicable diseases, including obesity. This article provides current data on the epidemiology of obesity in children and adolescents in the world. Obesity is recognized as a global problem as there is an increase in obesity worldwide. Some researchers estimate that by 2030, nearly a third of the world's population could be overweight or obese. This problem occurs not only in developed countries, but also in low- and middle-income countries. According to the WHO, between 1975 and 2016, worldwide, the proportion of children and adolescents aged 5–19 years who are overweight or obese more than quadrupled, from 4% to 18% (WHO, 2020). In 2019, approximately 38 million children under 5 years of age were overweight or obese (WHO, 2020). Childhood obesity has a 70-80% likelihood of leading to adolescent and adult obesity. Today, obesity is considered the most important risk factor for cardiovascular diseases (CVD) and metabolic disorders (according to WHO, it determines the development of up to 44-57% of type 2 diabetes mellitus, 30% of cholelithiasis, 17-23% of cases of coronary heart disease, 17% - arterial hypertension, 14% - osteoarthritis) and reproductive dysfunction and an increased risk of developing cancer.

Keywords: obesity, epidemiology, metabolic disorders.

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Today, one of the pressing issues for modern society is the fight against risk factors for the development of non-communicable diseases, including obesity (Zadvornaya O. L., 2019; Khodzhieva M. V., 2017, Martynova I. N., 2017). Obesity is recognized as a global problem as there is an increase in obesity worldwide. Some researchers believe that by 2030, almost a third of the world's population may be overweight or obese (Mkrtumyan A.M., 2018; Finkelstein E.A., 2012). This problem occurs not only in developed countries, but also in low- and middle-income countries. According to the WHO, between 1975 and 2016, worldwide, the proportion of children and adolescents aged 5–19 years who are overweight or obese more than quadrupled, from 4% to 18% (WHO, 2020). In 2019, approximately 38 million children under 5 years of age were overweight or obese (WHO, 2020).

The results of a national nutrition survey, first conducted in 2017 by the United Nations Children's Fund (UNICEF) and the Ministry of Health of the Republic of Uzbekistan, showed that among adolescent girls 15-19 years old, 10.7% are overweight or obese, and overweight in children is observed at 4.6%. 40.7% of women of reproductive age (15−49 years) in the republic are overweight, 15.5% of women are obese, and the older a woman is, the more prone she is to being overweight (UNICEF report, 2017). The report notes that Central Asia and Europe are experiencing the fastest increases in obesity among children under 5 years of age. According to statistics, from 2000 to 2018, the obesity rate in the world increased by 0.4 units, while in Central Asia and Europe it increased by 6.6.

Today, obesity is considered the most important risk factor for cardiovascular diseases (CVD) and metabolic disorders (according to WHO, it determines the development of up to 44-57% of type 2 diabetes mellitus, 30% of cholelithiasis, 17-23% of cases of coronary heart disease, 17% - arterial hypertension, 14% - osteoarthritis) (WHO, 2013; James W.P.T, 2003) and reproductive dysfunction and increased risk of developing cancer (Ligibel J.A., 2014; Mahmood T.A., 2012; Lloyd L.J., 2012).

Obesity is a multifactorial disease, the cause of which may be the interaction of genetic predispositions and environmental factors (Albuquerque D., 2017; Bulatova E. M., 2019; Belyaeva I. A., 2020). Prevention from an early age effectively reduces the occurrence of obesity and its associated diseases, reduces the risk of mortality as a result of cardiovascular diseases and cancer (Jungheim E.S., 2012; Jiao L., 2010). According to WHO, the incidence of obesity worldwide has almost tripled since 1975, with the proportion of children and adolescents aged 5–19 years who are overweight or obese more than quadrupling from 4% to 18% between 1975 and 2016. % worldwide. In 2019,

approximately 38 million children under 5 years of age were overweight or obese [19].

The global increase in childhood obesity is alarming, with a sharp increase in the proportion of children with obesity in almost every country in the world between 1975 and 2016 (see Figure 1). Some researchers estimate that by 2030, nearly a third of the world's population could be overweight or obese.

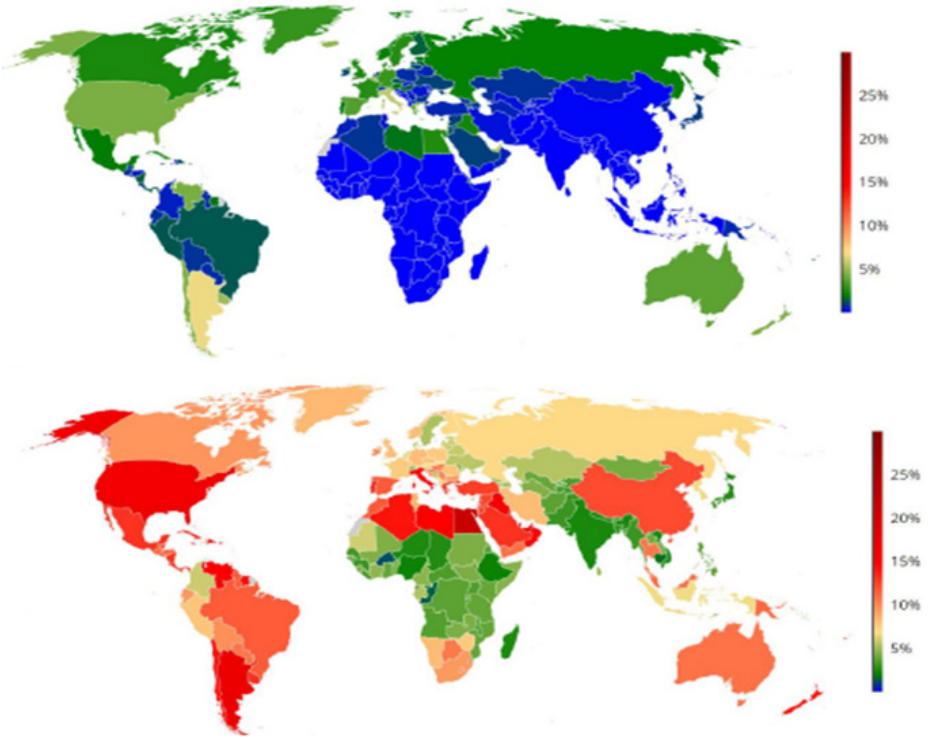

Figure 1 - World map of the prevalence of obesity in girls under 5 years in 1975 (top) and 2016 (bottom). Source: NCD-RisC

CDC statistics in the USA for children and adolescents 2-19 years old in 2017-2018. showed that the rate of obesity was 19.3%, and obesity was found in approximately 14.4 million children and adolescents, of which the incidence of obesity among children 2 to 5 years of age was 13.4%. There is a high prevalence of obesity among children in certain populations. For example, the rate of obesity among Hispanic children is 25.6%, and among non-Hispanic Asian children it is 8.7% [7].

In Europe, childhood obesity rates have risen alarmingly in many countries in recent years. Countries in the Mediterranean region have the highest growth rates, even where childhood obesity rates are on par with the United States, up to 30% [17]. In addition, studies have shown a rapid increase in obesity: in the 1970s the average annual growth rate was 0.2%, now it is 2% (equivalent to approximately 400,000 children per year) [1,4,8].

In Russia, more than 50% of the adult population is overweight, about 30% suffer from obesity of varying severity [67]. In the population of children and adolescents in Russia, the epidemiological situation is comparable to the situation in other European countries; the prevalence of obesity among children and adolescents aged 11, 13 and 15 years in Russia increased between 2002 and 2014: in girls - 4 times, in boys - 3 times, and by 2014 these figures were 2% and 5.4%, respectively. However, the most noticeable increase in obesity rates was in boys, more than in girls [12]. During an all-Russian interregional multicenter epidemiological study assessing the nutritional status of children aged 1 to 3 years, conducted in 2011-2013, it was found that the prevalence of overweight was diagnosed in 29.2% of children [16]. According to a multicenter study of 5,182 children aged 5, 10 and 15 years living in different regions of the Russian Federation, the prevalence of overweight was recorded at 19.9%, and obesity at 5.6% of cases. The highest prevalence of overweight and obesity in boys and girls was recorded at the age of 10 years (28.9 and 17.6%, respectively), and the minimum rates were at 15 years (17 and 11.5%). The prevalence of this pathology may be representative for different regions of the Russian Federation [46].

As of 2019, approximately 38.2 million children under 5 years of age worldwide are

overweight or obese, of whom up to half live in resource-poor countries, Africa and Asia, and the rate of increase in childhood obesity is very high [198]. For example, in Africa, the number of overweight children under 5 has increased by 50% since 2000. From 1980 to 2013, the proportion of overweight and obesity among children and adolescents in developing countries increased from 8.1 to 12.9% for boys and from 8.4 to 13.4% for girls [6,7,8,9, 14,50]. The proportion of obese high school-age children has also rapidly increased in Asia.

In China in 2018, the overweight rate among Chinese primary and secondary school children was 14.0% and the obesity rate was 10.5%. Scientists from China conducted a study involving 32,862 Chinese children under 5 years of age, the results of which are as follows: the rate of overweight among children under 5 years of age in both urban and rural areas is 8.4%, while the proportion obesity among young children is 8.4% (9.4% in boys, 7.2% in girls); the proportion of obese children among low-, middle-, and high-income families was 2.8%, 3.3%, and 3.5%, respectively [20, 27].

In Malaysia, a study of 7,749 children (aged 7–12 years) found 19.9% to be obese, with boys and children living in urban areas being at higher risk of obesity than others [13].

In Indonesia, according to a study published in 2016, the proportion of children with obesity and diabetes mellitus increased to 16.5%, and the following risk factors for obesity were identified: age 2 - 2.9 years, male gender, overweight or obesity from parents [16]. Currently, the COVID-19 pandemic is a global burden on human health and healthcare. Social isolation may lead to increased fat accumulation and increased prevalence of obesity in children and adolescents [49]. Obese patients have been shown to be potentially more vulnerable to COVID-19 and more infectious than normal-weight patients. Comorbidities associated with obesity complicate the clinical course of COVID-19 and cause hospitalization, the need for artificial ventilation and various complications. Globally, a strong association has been found between COVID-19 mortality and the prevalence of overweight in adults [51].

The Political Declaration, adopted in September 2011 by the UN General Assembly High-Level Meeting on the Prevention and Control of Noncommunicable Diseases, recognizes the importance of reducing the prevalence of unhealthy diets and physical inactivity. The declaration reaffirms the commitment to further implementation of the WHO Global Strategy on Diet, Physical Activity and Health, including, as appropriate, through policies and actions to promote healthy diets and physical activity among the entire population. WHO has also developed the “Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013–2020.” as part of the implementation of the commitments proclaimed in the UN Political Declaration on Noncommunicable Diseases (NCDs), approved by heads of state and government in September 2011. The Global Action Plan will support progress towards nine global noncommunicable disease targets by 2025, including a 25% reduction in premature mortality from NCDs and stabilization of global obesity rates at 2010 levels. Taking into account the multifactorial nature of exogenous constitutional obesity, the main predictors for adolescence are identified, such as physical inactivity, imbalance of energy metabolism, family history, psycho-emotional stress. All these factors are triggers for the development of this disease, but genetic determinants take part in the development of obesity from 25 to 70%. Candidate genes have an additive effect and, interacting with the above factors, can lead to an increase in BMI.

Although many studies have been conducted worldwide, the exact prevalence of obesity is unknown, and results vary widely depending on age, sample selection, and the population studied. However, several studies show that the incidence of childhood obesity is increasing in developing countries.

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LIST OF REFERENCE

[1] Klingberg E., Bilberg A., Bjцrkman S. et al. Weight loss improves disease activity in patients with psoriatic arthritis and obesity: an interventional study // Arthritis Res Ther.

2019, 21 (1), 17.

[2] Khashayar P., Kasaeian A., Heshmat R. et al. Childhood Overweight and Obesity and Associated Factors in Iranian Children and Adolescents: A Multilevel Analysis; the CASPIAN-IV Study // Front Pediatr. 2018, 6, 39.

[3] Qiu S., Cai X., Yang B. et al. Association Between Cardiorespiratory Fitness and Risk of Type 2 Diabetes: A Meta-Analysis. Obesity (Silver Spring). 2019, 27 (2), 315–324.

[4] Baltieri L., Cazzo E., de Souza A. L. et al. Influence of weight loss on pulmonary function and levels of adipokines among asthmatic individuals with obesity: One-year follow-up // Respir Med. 2018, 145, 48–56.

[5] Goit R. K., Pant B. N., Shrewastwa M. K. Moderate intensity exercise improves heart rate variability in obese adults with type 2 diabetes // Indian Heart J. 2018, 70 (4), 486–491.

[6] Valerio G., Maffeis C., Saggese G. et al. Diagnosis, treatment and prevention of pediatric obesity: consensus position statement of the Italian Society for Pediatric Endocrinology and Diabetology and the Italian Society of Pediatrics // Ital J Pediatr. 2018, 44 (1), 88.

[7] Astrup A., Raben A., Geiker N. The role of higher protein diets in weight control and obesity-related comorbidities // Int J Obes. 2015, 39, 721–726.

[8] Hollands G. J., Shemilt I., Marteau T. M. et al. Portion, package or tableware size for changing selection and consumption of food, alcohol and tobacco // Cochrane Database Syst Rev. 2015, 9. CD011045.

[9] Barlow S. E. Expert Committee. Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: summary report // Pediatrics. 2007, 120 (Suppl 4), 164–192.

[10] Burke L. E., Wang J., Sevick A. M. Self-monitoring in weight loss: a systematic review of the literature // J Am Diet Assoc. 2011; 111: 92–102.

[11] Jddskelдinen A., Schwab U., Kolehmainen M. et al. Associations of meal frequency and breakfast with obesity and metabolic syndrome traits in adolescents of northern Finland birth cohort 1986 // Nutr Metab Cardiovasc Dis. 2013, 23, 1002–1009.

[12] Schlundt D. G., Hill J. O., Sbrocco T. et al. The role of breakfast in the treatment of obesity: a randomized clinical trial // Am J Clin Nutr. 1992, 55, 645–651.

[13] Spear B. A., Barlow S. E., Ervin C. et al. Recommendations for treatment of child and adolescent overweight and obesity // Pediatrics. 2007, 120 (Suppl 4), 254–288.

[14] Taveras E. M., Gortmaker S. L., Hohman K. H. et al. Randomized controlled trial to improve primary care to prevent and manage childhood obesity: the high five for kids study // Arch Pediatr Adolesc Med. 2011, 165, 714–722.

[15] Maximova K., Ambler K. A., Rudko J. N. et al. Ready, set, go! Motivation and lifestyle habits in parents of children referred for obesity management // Pediatr Obes. 2015, 10, 353–360.

[16] Birch L. L., Savage J. S., Fischer J. O. Right sizing prevention. Food portion size effects on children's eating and weight // Appetite. 2015, 88, 11–16.

[17] Societa Italiana di Nutrizione Umana. Livelli di assunzione di riferimento di nutrienti ed energia per la popolazione Italiana (LARN). IV Revisione. Milano. SICsS Editore. 2014.

[18] Sothern M., Udall J. N., Suskind R. M. et al. Weight loss and growth velocity in obese children after very low calorie diet, exercise, and behavior modification // Acta Paediatr. 2000, 89, 1036–1043.

[19] Epstein L. H., Squires S. The stoplight diet for children: an eight week program for parents and children. Boston. Little Brown & Co. 1988.

[20] Epstein L. H., Paluch R. A., Beecher M. D. et al. Increasing healthy eating vs. reducing high energy-dense foods to treat pediatric obesity // Obesity (Silver Spring). 2008, 16, 318–326.

[21] Stoner L., Rowlands D., Morrison A. et al. Efficacy of exercise intervention for weight loss in overweight and obese adolescents: meta-analysis and implications // Sports Med. 2016, 46, 1737–1735.

[22] Ho M., Garnett S. P., Baur L. A. et al. Impact of dietary and exercise interventions on weight change and metabolic outcomes in obese children and adolescents: a systematic review and meta-analysis of randomized trials // JAMA Pediatr. 2013, 167, 759–768.

[23] Garcна-Hermoso A., Sбnchez-Lypez M., Martнnez-Vizcaнno V. Effects of aerobic plus resistance exercise on body composition related variables in pediatric

obesity: a systematic review and meta-analysis of randomized controlled trials // Pediatr Exerc Sci. 2015, 27, 431–440.

[24] Strong W. B., Malina R. M., Blimkie C. J. et al. Evidence based physical activity for school-age youth // J Pediatr. 2005, 146,732–737.

[25] McNarry M. A., Mackintosh K. A. Investigating the relative exercise intensity of exergames in prepubertal children // Games Health J. 2016, 5, 135–140.

[26] Gao Z., Chen S. Are field-based exergames useful in preventing childhood obesity? A systematic review // Obes Rev. 2014, 15, 676–691.

[27] Altman M., Wilfley D. E. Evidence update on the treatment of overweight and obesity in children and adolescents // J Clin Child Adolesc Psychol. 2015, 44, 521–537.

[28] Wilfley D. E., Stein R. I., Saelens B. E. et al. Efficacy of maintenance treatment approaches for childhood overweight: a randomized controlled trial // JAMA. 2007, 298, 1661–1673.

[29] Boutelle K. N., Cafri G., Crow S. J. Parent-only treatment for childhood obesity: a randomized controlled trial // Obesity. 2011, 19, 574–580.

[30] Mamun A. A., Mannan M., Doi S. A. Gestational weight gain in relation to offspring obesity over the life course: a systematic review and bias-adjusted meta-analysis // Obes Rev. 2014, 15, 338–347.

[31] Williams C. B., Mackenzie K. S., Gahagan S. The effect of maternal obesity on the offspring // Clin Obstet Gynecol. 2014, 57, 508–515.

[32] Starling A. P., Brinton J. T., Glueck D. H. et al. Associations of maternal BMI and gestational weight gain with neonatal adiposity in the healthy start study // Am J Clin Nutr. 2015, 101, 302–309.

[33] Institute of Medicine. Weight gain during pregnancy: reexamining the guidelines. Washington: National Academies Press, 2009.

[34] Mund M., Louwen F., Klingelhoefer D. et al. Smoking and pregnancy a review on the first major environmental risk factor of the unborn // Int J Environ Res Public Health. 2013, 10, 6485–6499.

[35] Mшller S. E., Ajslev T. A., Andersen C. S. et al. Risk of childhood overweight after exposure to tobacco smoking in prenatal and early postnatal life // PLoS One. 2014, 9, e109184.

[36] Baidal W. J. A., Locks L. M., Cheng E. R. et al. Risk factors for childhood obesity in the first 1,000 days: a systematic review // Am J Prev Med. 2016, 50, 761–779.

[37] Victora C. G., Bahl R., Barros A. J. D. et al. Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect // Lancet. 2016, 387, 475–490.

[38] Vail B., Prentice P., Dunger D. B. et al. Age at weaning and infant growth: primary analysis and systematic review // pediatr. 2015, 167, 317–324.

[39] Fewtrell M., Bronsky J., Campoy C. et al. Complementary feeding: a position paper by the European Society for Paediatric Gastroenterology, hepatology, and nutrition (ESPGHAN) committee on nutrition // J Pediatr Gastroenterol Nutr. 2017, 64, 119–132.

[40] Patro-Golab B., Zalewski B. M., Kouwenhoven S. M. P. et al. Protein concentration in milk formula, growth, and later risk of obesity: a systematic review // J Nutr. 2016, 146, 551–564.

[41] Voortman T., Braun K. V., Kiefte-de Jong J. C. et al. Protein intake in early childhood and body composition at age of 6 years: the generation R study // Int J Obes (London). 2016, 40, 1018–1025.

[42] Pan L., Li R., Park S. et al. A longitudinal analysis of sugar-sweetened beverage intake in infancy and obesity at 6 years // Pediatrics. 2014, 134 (Suppl 1), 29–35.

[43] Casas R., Sacanella E., Urpн-Sarda M. et al. Long-term immunomodulatory effects of a Mediterranean diet in adults at high risk of cardiovascular disease in the PREvenciyn con DIeta MEDiterrбnea (PREDIMED) randomized controlled trial // J Nutr. 2016, 146, 1684–1693.

[44] D'Alessandro A., De Pergola G. Mediterranean diet pyramid: a proposal for Italian people // Nutrients. 2014, 6, 4302–4316.

[45] Cobb L. K., Appel L. J., Franco M. et al. The relationship of the local food environment with obesity: a systematic review of methods, study quality, and results // Obesity (Silver Spring). 2015, 23, 1331–1344.

[46] Hu F. B. Resolved: there is sufficient scientific evidence that decreasing sugarsweetened beverage consumption will reduce the prevalence of obesity and obesity-related diseases // Obes Rev. 2013, 14, 606–619.

[47] Bucher Della Torre S., Keller A., Laure Depeyre J. Sugarsweetened beverages

and obesity risk in children and adolescents: a systematic analysis on how methodological quality may influence conclusions // J Acad Nutr Diet. 2016, 116, 638–659.

[48] De Bock F., Genser B., Raat H. et al. A participatory physical activity intervention in preschools // Am J Prev Med. 2013, 45, 64–74.

[49] Koren D., Dumin M., Gozal D. Role of sleep quality in the metabolic syndrome // Diabetes Metab Syndr Obes. 2016, 9, 281–310.

[50] Fatima Y., Doi S. A., Mamun A. A. Longitudinal impact of sleep on overweight and obesity in children and adolescents: a systematic review and bias adjusted meta-analysis // Obes Rev. 2015, 16, 137–149.

[51] Paruthi S., Brooks L. J., D'Ambrosio C. et al. Recommended amount of sleep for pediatric populations: a consensus statement of the American Academy of sleep medicine // J Clin Sleep Med. 2016, 12, 785–786.