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## Developmental Features and Twins Mental Health at Early Age: A Review of Domestic and Foreign Studies

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**Objectives.** Due to the increasing birth rate of twins and the high risk of delayed physical, cognitive, and psychosocial development in twins at an early age, there is a need to identify factors that contribute to the mental health and developmental trajectory of children.

**Methods.** We conducted a review and analysis of recent domestic and international research from 183 articles published between 2009 and 2024, and available in the Scopus, Semantic Scholar, PubMed, Bielefeld Academic Search Engine, Russian Science Citation Index (RSCI) and Crossref databases. The search used the keywords “infant twins”, “twins at early age”, “twins early development”, “twins interaction”.

**Results.** The interest of researchers in different aspects of the mental health and development of children born from monozygotic and dizygotic twin pregnancies is shown. The main factors affecting the health and development of twins are genetic factors, congenital defects, gestational age and birth weight, the presence of trauma during birth, as well as the somatic health of children in the first months of life. The early development of twins is closely related to the features of the care organization and parenting, interaction with the mother, as with a caring adult, a set of environmental factors and conditions for the education. At an early age, twins are at high risk of lagging in general physical, cognitive and speech impairment development compared with singleton, which should be taken into account in monitoring the need for early help for children.

**Conclusions.** There is a need for relevant domestic research on the features of the development of twins at an early age. The study of the individual trajectory of early development of each child from twins should be carried out taking into account the factor of discordance in a twin pair.

**Keywords:** infant twins; discordance; prematurity; early development; early help; mental health

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## Особенности развития и психическое здоровье близнецов раннего возраста: обзор отечественных и зарубежных исследований

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**Актуальность и цель.** Вследствие увеличения частоты рождаемости близнецов, а также наличия высокого риска отставания общего физического, когнитивного и психоречевого развития двойни раннего возраста, актуализируется проблема поиска факторов, влияющих на психическое здоровье и траекторию развития детей.

**Методы и методики.** Проведен обзор и анализ материалов современных отечественных и зарубежных исследований из 183 статей, опубликованных с 2009 по 2024 годы и представленных в базах данных Scopus, Semantic Scholar, PubMed, Bielefeld Academic Search Engine, РИНЦ и Crossref. Поиск осуществлялся с использованием ключевых слов: «двойня раннего возраста», «близнецы раннего возраста», «раннее развитие близнецов», «взаимодействие в двойне». Проанализированы исследования различных аспектов развития и психического здоровья детей, рожденных в монозиготных и дизиготных двойнях.

**Результаты.** Основными факторами, в целом негативно влияющими на здоровье и развитие двойни, являются: различные генетические (врожденные) факторы; нарушение или задержка внутриутробного развития; гестационный возраст и вес при рождении; наличие травматизации в родах; а также соматическое состояние детей в первые месяцы жизни. Более низкий вес при рождении, а также риски травматизации в родах выше у ребенка, рожденного вторым по порядку. Динамика развития близнецов и их психическое здоровье зависит от условий развития в первые годы жизни и особенностей их функционирования. В этот период показатели психомоторного и познавательного развития близнецов находятся в пределах нижней границы возрастной нормы, при этом наибольшая задержка в развитии наблюдается в речевой сфере.

**Выводы.** Изучение индивидуальной траектории раннего развития каждого ребенка из двойни должно проводиться с учетом фактора дискордантности в близнецовой паре. Развитие близнецов в первые годы жизни связано с соматическим состоянием детей, особенностями организации ухода и воспитания, взаимодействием с матерью как с близким ухаживающим взрослым, с совокупностью факторов среды и условиями организации обучения, что должно быть учтено в мониторинге нуждаемости детей в ранней помощи. Подчеркивается потребность специалистов в актуальных отечественных исследованиях особенностей развития двойни раннего возраста. Перспективным направлением в исследованиях может являться изучение особенностей когнитивного, моторного, речевого, социально-эмоционального развития двойни раннего возраста, в которой один или оба ребенка имеют нарушения в развитии.

**Ключевые слова:** близнецы раннего возраста; двойня раннего возраста; дискордантность; недоношенность; раннее развитие; ранняя помощь; психическое здоровье

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### Introduction

Over the past 15 years, the frequency of twin births in the world has increased significantly, including in connection with the development of assisted reproductive technologies, as well as with the increased fre-

quency of oral contraception, against the background of the withdrawal of which spontaneous maturation of two or more follicles can occur. The frequency of twin birth on average in different countries is about 2.5–3% of newborn children, of which three quarters have a dichorionic type of placentation during intrauter-

ine development [1; 12; 13; 14]. Also, among dichorionic twins, about two thirds are dizygotic twins and about one third are monozygotic twins. The presence of monochorionic placentation significantly increases the risk of fetal growth restriction syndrome. Monochorionic twins are more likely to have lower Apgar scores at birth as well as clinical signs of hypoxia [5; 12; 18].

The delivery of multiple pregnancies is usually performed early (at 35-37 gestational weeks) and more often by cesarean section than in singleton pregnancies [2; 11]. The birth of twins is most often associated with a disruption in the duration of labor (rapid or conversely prolonged labor) and an increased risk of trauma to the children during labor. At the same time, lower weight and risks of traumatization are higher in the child born second [9; 17; 18]. Researchers also note that male twin babies are at a greater risk of infant mortality than female twin babies. Features of intrauterine development, difficulties during the course of labor and neonatal period, genetic factors, the characteristics of the organization of daily care and home environment of twins significantly affect the physical and mental health of children in a twin pair.

The World “Zero To Three” organization, with the assistance of the World Association for Infant Mental Health (WAIMH), based on the results of many years of research, consider the mechanisms and factors of child development and functioning as key aspects of the concept of infant and early childhood mental health (IECMH). Child mental health refers to the child’s evolving ability from birth to 5 years old to form close and secure relationships with adults and peers, to experience, regulate, and express a full range of emotions, and to learn and explore his or her environment [4]. This ability is qualitatively reflected in the development of a child’s full cognitive, emotional, motor, and adaptive functioning [4]. In the issues of supporting the mental health and development of infant twins, it is relevant to study the factors affecting the quality of this ability in each child of a twin pair.

## Methods

We analyzed foreign and domestic articles presented in Scopus, Semantic Scholar, PubMed, Bielefeld Academic Search Engine, RSCI and Crossref databases using the following keywords: for English databases — “infant twins”, “twins at early age”, “twins early development”, “twins interaction”; for domestic databases — “infant twins”, “early twin development”,

“twin interaction”. A total of 183 articles (126 articles in foreign journals and 57 articles — in domestic journals) published primarily from 2009 to 2024 were reviewed. This review prioritized articles with a high citation index and presenting voluminous empirical data. Additional attention in the review was paid to new relevant data from a large-scale longitudinal study of 16 thousand pairs of twins — the Twins Early Development Study (TEDS) [31].

## Results

### Features of the Postnatal Development of Twins: General Biological and Psychological Aspects

At an early age, twin children are characterized by a high risk of lagging behind in overall physical, intellectual and psycho-speech development compared to singleton children [3]. In general, twins have lower indices of psychomotor and cognitive development compared to singleton children, but twin indicators are often within the lower limit of normal. Also, children from dizygotic twins show higher indices of cognitive development than monozygotic twins [8].

In the first year of life, the general delay in the psychophysical development of twin children is largely due to gestational age and birth weight, complications with the mother’s pregnancy, the presence of traumatization in childbirth, and general genetic features [33]. As children grow older, experts attribute the features and dynamics of their development to a greater extent to developmental conditions: the features of the organization of care and education, interaction with a close caring adult, a combination of environmental factors and the conditions of the organization of education, taking into account the individual characteristics and needs of each child separately [27].

The analysis of scientific publications in this review has shown that the hypothesis about the exclusive connection of delay or deviation in the psychophysical development of infants and young children with the common factor of their birth in monozygotic or dizygotic twins has not been reliably confirmed [23; 27; 34; 36]. From our point of view, in this issue, the discordant approach may be the most promising and reasonable principle of searching for factors determining the trajectory of early development of twins. Discordance, or a dissociation of children in twins, is characterized by the presence of pronounced differences in the physical development of the children, most often associated with the low birth weight and height of one child of a twin [27]. In South Korea, a longitudinal study of

more than 3,000 discordant pairs of monozygotic and dizygotic twins born at term showed that twins, where there was a weight difference of 20% or more between the children at birth, were more likely to have neurodevelopmental disorders [17]. In these twins, the children were more likely to have delayed psychomotor and speech development, autism spectrum disorder, attention deficit disorder and hyperactivity disorder in early childhood and the preschool age. E. Escolano-P rez in her study also showed qualitative differences of cognitive skills in twin children with discordant birth weight at 18, 21, and 24 months of age [21]. It has also been shown that children in discordant twins are more likely to have different rates of development, which should be taken into account when designing the content of early help programs with a mandatory combination of joint and separate forms of lessons.

The issue of higher risk of autism spectrum disorder (ASD) development in twin children also remains debatable. Researchers cite the paucity of population-based studies that would indicate a significant difference in the risk of ASD in twins with population-average incidence rates [24; 25; 41; 42]. Recent studies show that this disorder, as one of the most frequent disorders of neuropsychiatric development in children, is most often associated with the presence of a genetic (congenital) factor, older parental age, a low gestational age, and a low birth weight [4; 19]. As noted earlier, these factors are often found in twin birth situations, but they are not prognostically determinant of the development of the disorder in one or both children [20].

Over the past 10 years, the influence of the hereditary factor has also been repeatedly studied in the context of behavior disorder and aggression in twin children [16]. The factor of environmental influence explained up to 20% of cases of aggressive behavior, in other cases the behavior of children in the preschool and junior school ages was explained by the influence of congenital features.

The greatest interest of researchers in the issue of the normative psychological development of infant twins is attracted by the sphere of speech. Among the general features of speech development in twin children they note the late appearance of the first words, a delayed formation of phrasal speech (by two and a half years), a slow expansion of the active vocabulary of children, a later development of correct articulation skills [1; 8; 10; 35]. Despite the general delay in speech development compared to single-born children, by the end of preschool age twins reach the level of the age norm in speech development [29]. In general, experts

note that the delay in speech development of twin children in the first years of life should be considered in the system of the general psychophysical development of children and take into account epigenetic and environmental factors.

### **Influence of the Organization of Care for Twins on the Development of Children at an Early Age**

Experts often attribute the dynamics in the psychophysical development of twin children in early childhood and the preschool age to environmental conditions and the organization of daily care, as well as to the features of interaction with parents in natural life situations.

During the first months of life, parents of twins most often provide care that fully corresponds to the content of care for a single child. However, twin children are more likely to be left alone and less likely to be held, which potentially affects the pace of mental development due to the risk of partial deprivation.

While providing day-to-day care for twins, parents may experience various difficulties in organizing the feeding of their children. In 2023, a group of scientists led by A.R. Kininmonth showed the results of a study of the features of the nutrition of twins of different age groups (from 16 months to 5 years). At an early age in twin pairs, where parents demonstrated a more directive position in feeding and put more pressure on children in the process of eating, the following features of children were noted: less sensitivity to food, less pleasure from eating, a slower rate of eating, a greater sensitivity to satiety, higher emotional malnutrition, a manifestation of greater fussiness [29]. As the child grew older, parents of twins rarely changed the twins' feeding practices and put more pressure on the child who showed less appetite, which exacerbated the negative patterns of their eating behavior.

Arranging twins to sleep together or separately has also been studied by researchers from various aspects of the effects on children's health and development. A number of experiments have shown that twins sleeping in the same bed is positively correlated with greater weight gain in children in the first months of life [30]. Co-sleeping of twins reduces waking time and increases the duration of sleep of the children during the night, and also increases the duration of the sleep of the mother. Also curious is the result of a study indicating the pain relief and faster recovery of an infant after a heel puncture as a result of a laboratory blood draw in cases where the infant has shared a bed with a sibling since birth [32].

Thus, the study of the issues of the organization of care and upbringing of infant twins remains a relevant

area of research among specialists making attempts to develop recommendations that, on the one hand, will optimally take into account the general and individual needs of twins, and on the other hand, lighten the load and reduce the resource costs of parents.

### **Features of Interaction with a Sibling and Mother and the Development of Identity in Twin Children**

The mental health of young children is formed in the context of close and safe relationships with the people around them. The beginning of the process of child's understanding of themselves as a conscious subject with physical and psychological boundaries separate from the outside world begins at an early age and is conditioned by his optimal functioning and understanding of his own needs and abilities. This process is closely related to the child's early experience of interaction with a close caring adult, most often the mother. The child's early relationship with the mother in the dyad is the primary source of all social relationships of the child's personality in the future. An additional specificity is the situation of development of the Self in twin children, when from birth the formation of the child's image of the "Self" occurs in continuous close contact with a sibling, complicating the process of identifying oneself as an integral and independent person [37]. Some of these features are explained by researchers in the framework of the "twin situation" phenomenon, characterized by an internal struggle of the multidirectional aspirations of twins: the desire of twins for mutual identification and at the same time the desire to isolate the separate "Self" of each of them. L.E. Prino et al. conducted a study of 105 monozygotic and dizygotic twins aged 4 to 6 years using a drawing technique to study the processes of individuation and the formation of the image of the "Self" [37]. Monozygotic twins demonstrated the greatest difficulties in self-presentation and the identification of features in the image of the "Self" separate from the sibling.

The features of the intrapair interaction of twin children at an early age are poorly studied. There is a domestic study demonstrating the nature of intrapair relationships in twins, which are reflected in the formation of the internal position of children 6–7 years old. A.S. Kuzmina and E.S. Praizendorf, studying 100 twins of preschool age, showed that in cases of intrapair rivalry in dizygotic twin children are inclined towards independence, they can assume greater responsibility and show a more critical attitude towards the results of their own activities. Intrapair coopera-

tion, characteristic to a greater extent of monozygotic twins, creates a basis for predicting their own success, a positive evaluation of their own performance and self-acceptance [6].

A longitudinal study of more than 1.5 thousand twins in the age period from 3 to 8–9 years assessed the dynamics in sibling relationships from four dyadic aspects: closeness, dependence, conflict and rivalry [40]. As children grew older, their closeness and dependence on each other decreased against the background of increased rivalry by the younger school age. Conflict manifestation increased only in dizygotic twins. At an earlier age, monozygotic twins had a higher level of closeness and dependence than dizygotic twins, but no significant difference in the levels of their conflict and rivalry was found. It was noted that all the mentioned dyadic aspects were also related to parental attitudes supporting or rejecting certain behaviors of the children towards each other, which should be further investigated.

Mother-child interaction in infancy and early childhood is considered by researchers from a dyadic approach, where the mother, as a close caring adult, is the primary source of the basic conditions of child development [4]. During pregnancy, women expecting twins show high prenatal attachment scores, like women with singleton pregnancies [43]. In cases of distress and symptoms of depression in pregnant women expecting twins, the children showed less motor activity and acts of touching their own bodies in the intrauterine environment [38]. The specificity of dyadic relationships in the "mother-twins" system is that in the early infancy of children, mothers tend to focus their attention on twins in a generalized way and build a unified interaction with the children, without paying special attention towards the characteristics and needs of each child separately [15]. Also, in the infancy of children, mothers of both monozygotic and dizygotic twins exhibit the same behavior [21].

The sensitivity and responsiveness of the mothers of twins also has specific characteristics to some extent. A study by C. Riva Crugnola et al. showed that the weak sensitivity of mothers is related exclusively to a situation of infant twin upbringing and not to the personal characteristics of the women themselves [39]. In their interactions with their children, mothers of twins often exhibit different behaviors with each child, with more detached and distant behaviors than mothers of a single infant [26]. The researchers also note that the reduced sensitivity and responsiveness of mothers does not significantly affect the level of socioemotional and communicative development of



twin children during the first year of life, which indicates the relative stability and isolation of the mechanisms of mental development of twins in the context of attachment to a close caring adult.

The current research interest of specialists is also related to the study of maternal speech features in the process of interaction between mothers and twin children [7; 30]. Voice frequency and intonation contour patterns in speech addressed to each twin infant are different. Experimentally, it has been shown that when a mother speaks to an infant whose vocal response is fainter and more infrequent, she is more likely to use rising intonation.

Overall, the study of the characteristics of infant twin interaction with the mother and the immediate environment as factors influencing children's mental health and development remains an area of promising research.

## Conclusion

A review of domestic and foreign articles published over the last 15 years has shown a steady interest of researchers in the health and development of twins at different ages. The common factors that have a basic influence on the mental health and development of twin children are various genetic (congenital) factors,

gestational age and birth weight, the presence of traumatization in childbirth, and somatic condition in the first months of life. The development of twins in the first years of life is closely related to the features of the organization of care and education, the interaction with a close caring adult, a combination of environmental factors and the conditions of the organization of individual education. Studies show that it is important to consider the individual trajectory of early development of each twin child, taking into account the factor of discordance in the twin pair. Also, the review shows the need to take into account these current studies when developing the content of twin early help programs that take into account the different individual needs and requirements of each of the twin children. The analysis of publications also showed that there is a significant lack of domestic studies of the psychological characteristics of twins, including infancy and early childhood. A promising direction in research may be the study of the features of cognitive, motor, speech, social emotional development of twins of an early age, in which one or both children have any developmental disorders. The data of such studies will make it possible to expand the possibilities of providing psychological assistance to parents at the birth of twins and to develop specialized programs of early help taking into account the specifics of children in a twin pair. ■

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