

# Экспериментально доказано, **что дети, посещающие Footbik, опережают в развитии** своих сверстников, которые не посещают клуб.

Исследование проводилось на протяжении 2016-2017 года Харьковским национальным медицинским университетом, а именно:

доктором медицинских наук, профессором кафедры педиатрии №1 и неонатологии ХНМУ **Е.А. Рига**,  
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специалистом **И. Пилги**.

*В исследовании принимало участие 323 ребенка, среди которых - 208 посещающих Footbik.*

Резюме исследования:

«**Дети, посещающие Footbik более 110 часов, демонстрируют опережение в развитии** в сравнении со сверстниками, которые не посещают клуб. В частности в **4.6 раз** наблюдается прогресс **мелких моторных навыков, 5.2 раз** крупной моторики, **5 раз** **навыки самообслуживания** и **3.2 раза** в **когнитивном (интеллектуальном) развитии**».

Подробнее об исследовании можно узнать в научном журнале “НЕОНАТОЛОГІЯ, ХІРУРГІЯ ТА ПЕРИНАТАЛЬНА МЕДИЦИНА” ТОМ 8, № 2(28) (2018) и ТОМ 8, № 3(29) (2018).



ISSN 2226-1230 (Print)  
ISSN 2413-4260 (Online)

# НЕОНАТОЛОГІЯ, ХІРУРГІЯ ТА ПЕРИНАТАЛЬНА МЕДИЦИНА

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## NEONATOLOGY, SURGERY AND PERINATAL MEDICINE

T. VIII, № 2(28), 2018



UDC: 613.954(477.54)  
DOI: 10.24061/2413-4260.VIII.2.28.2018.6

## DEVELOPMENT OF HEALTHY CHILDREN OF EARLY AND PRESCHOOL AGE IN KHARKIV: I STAGE

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**Резюме.** Physical activity and games are very important for normal development of abilities of the child, as they lay the foundation for the future abilities of the child to read, write, count and abilities of creative thinking. The game undeniably influences all the aspects of child development.

**Objective:** To evaluate the development of the children of 3, 4 and 5 years, living in Kharkiv and their peers, which go in for soccer to the football club for preschoolers "Footbik", based on the TOTAL SOCCER coaching method (the Netherlands). Methods: a prospective medical and social study of 323 children aged from 2 to 4.5 years living in Kharkiv (115 from kindergartens and 208 from sort section with special football methodics). The design of research included development of application forms, questionnaire for the parents of the children, creation of database and statistic processing of the obtained material on STATISTICA 7.

**Results.** The motor skills in the children of both groups did not differ. It is quite understandable that parents are willing for a "rapid physical" development of their child and send him/her to the football club for preschoolers. But the advance in motor skills in comparison with the peers needs time.

We have analyzed the period of attending the football club for preschoolers by the children of comparison group and according to this, have carried out the analysis of the children development. The majority of children - 143 (69%) - have been attending the sports club for less than half a year ( $p < 0.001$ ). From 6 to 12 months the sports club was attended by 54 (26%) children, more than a year - 11 (5%) children. That's why for a more detailed analysis and collection of the evidence it is necessary to conduct the II stage of research, namely, the influence of the period of attending the football club for preschoolers on the child development. Our stage of the research defined that the frequency of the cognitive (intellectual) development was better in children going to the football club for preschoolers with the special coaching method. It should be pointed out that the advance of social and emotional development was observed only in children going to kindergartens.

**Conclusions.** It was identified that physical development in children of the early and preschool age does not differ in children going to kindergartens or football club for preschoolers. A statistically important frequency of advancement in cognitive (intellectual) development of the child was recorded among the children going to the football club for preschoolers. An advancement in social and emotional development was recorded in children going only to kindergartens.

**Key words:** Children; Preschool Age; Development; Coaching.

Game is an essential thing for the child development, as it contributes to the child's cognitive, physical, social and emotional well-being [1]. Physical exercises and games not only improve health and develop the child's body, but they are also a means of building character, they affect the child's behavior, as during games and physical exercise, the child learns to change his/her interests according to the interests of the group, to achieve the set goals with joint efforts, to form the conscience of the child properly. Children become friendly, disciplined, learn to consider their forces, feel that they are a part of the group.

Physical activity is quite important for normal development of the child, moreover, it lays the foundation for other spheres and abilities of the child [2-4].

A special significance physical development attains in children of early and preschool age. Modern pediatric science evaluates the development of children of early age according to the main domains (motor skills, cognitive skills, language, social and emotional development and adaptability). The Center for Disease Control and Prevention, USA, currently offers 38 screening tests and scales for evaluating children development [5].

Unfortunately not a single scale or a screening test is used in Ukraine, which does not allow to compare the development of the children of Ukrainian population with the children population of

other countries as well as to improve the quality of children medical care.

Physical activity and games are very important for normal development of abilities of the child, as they lay the foundation for the future abilities of the child to read, write, count and abilities of creative thinking. The game undeniably influences all the aspects of child development. In the process of game a child learns to draw conclusions, foresee the interconnection between events and processes. Team games develop the necessary social skills, a child learns to cooperate, defend his/her point of view, resolve conflicts (sometimes even with the help of adults). Recently, the results of the meta-analysis have been published, which prove that physical activity not only increases the functional capacity of the brain, but also prevents negative morphologic changes [6].

**Objective** - to evaluate the development of the children of 3, 4 and 5 years, living in Kharkiv and their peers, which go in for soccer to the football club for preschoolers "Footbik", based on the TOTAL SOCCER coaching method (the Netherlands).

### Materials and methods of research

A prospective medical and social study of 323 children aged from 2 to 4.5 years living in Kharkiv was conducted during 2016-2017 yrs. The design



of research included development of application forms, questionnaire for the parents of the children (September - December 2016), creation of database and statistic processing of the obtained material (January - June 2017). The questionnaire for parents was elaborated within the main domains. Medical domain includes physical development of the child, namely, the conformity of the body mass with the height and age; diseases in the medical history. Anthropomorphic measures were compared with the data of their signal allocation according to the age with the help of tables [7]. The domain of child development according to the main spheres: motor, cognitive, and social development. The given domain of the questionnaire was elaborated on the basis of information material on the child development provided by the Government of Western Australia, Department of Health for the children aged 3-4 years and 4-5 years [8, 9]. The delay in development was established, when a child didn't possess the skills, described for each sphere of development at a definite age. The advance in development was established by the questions of the questionnaire, which concerned older age for each sphere of development.

The method of selecting parents for the questionnaire was random. The parents of 115 children were interviewed in preschool institutions of Kharkiv by agreement of parents (the index group), separately were interviewed the parents of 208 children, going to the football club for preschoolers «Footbik», based on the TOTAL SOCCER coaching method (The Netherlands) (comparative group). For the statistic analysis of the data obtained with the questionnaire, a database with the number of observations for each answer was created (Excel for Windows). Description of quantitative and qualitative figures, intragroup changes were estimated with the help of cross tables with frequency and function in order to be able to combine the frequency of manifestation of observing on different levels the factors, studied with the help of STATISTICA 7. In order to compare the sampling parts, the method of angular transformation with the evaluation of F-criterion was used. The difference between parameters, which were compared by two points was considered statistically significant in  $p < 0.05$ .

### The results and their discussion

The average age of children of the index group - 3.6 (min - 2.9; max - 4.8) did not differ from the average age of the children from comparison group - 3.7 (min - 2.5; max - 4.8) years ( $p > 0.05$ ).

The respondents were mainly mothers. In kindergartens, 94% of questionnaires were answered by mothers, 3.4% by parents and 2.6% by grand-mothers and grand-fathers. The respondents of the sports club divided in the following way: mothers - 88% ( $p = 0.0843$ ), fathers - 10.5%, grandmothers and nannies - 1.5%. Thus, it can be said that in our society the development of children of early and preschool age is more typical for mothers. Even to such a "manly" football club for preschoolers children are carried by mothers.

### Medical domain

When evaluating the health of children, it was detected that in 109 (95%) children of the index group the body mass corresponded to the normal

measures according to the age, 1 (1%) child had a delay in 2 standard deviations, in 4 (5%) children the body mass was more than 2 standard deviations. In 186 (89%) children, who went to the sports club, the body mass was within the normal range, 1 (0.5%) child turned out to have delay in body mass in 2 standard deviations, in 21 (10%) the body mass corresponded with the values of more than two standard deviations. This is what the distribution of the height in children look like: in 103 (90 %) children of the index group the height corresponded with the age, in 2.3% children there was a delay in growth of 2 standard deviations, 8 % children had physical index of growth of more than 2 standard deviations. In 186 (89 %) children of the football club for preschoolers the height corresponded with the normal range, 1 (0.5 %) child turned out to have a delay in growth of 2 standard deviations, in 21 (10 %) children the height was more than 2 standard deviations. It should be mentioned that overweight was not observed in children, so their development can be considered harmonious. Thus, physical development of children of both groups was the same.

The data on the children morbidity in both groups turned out to be interesting. It is known that the children of early age often fall ill with respiratory and infectious diseases [11, 12]. While questioning the parents on the children morbidity it was found that 92 (80%) and 164 (79%) children of both groups had respiratory diseases 6 times a year ( $p = 0.8318$ ). But allergic and chronic diseases (retinopathy, hydronephrosis, hydrocephaly, etc.) were found in 12 (6 %) children from the comparison group ( $p = 0.0331$ ) and were not at all observed in the children of the index group. The desire of parents to improve the health of their children by means of sports is fully understood.

As for the children infectious diseases (chickenpox, rubella, infectious mononucleosis, etc.), 13 (11%) parents of the index group and 38 (18%) parents of the study group registered them in the responses without a significant difference ( $p = 0.971$ ).

It was identified by means of cross tables that children going to kindergartens or those who were the only child in the family often fell ill with respiratory diseases ( $p < 0.05$ ). The worries of parents concerning the state of health among the children going to the sports club were not connected with frequent respiratory diseases, while such worries were observed among the parents, who educated their children at home ( $p < 0.05$ ).

### The environment

The development of the child of early age is influenced by the surrounding environment [15]. Thus, even the second child in the family already has a different environment for development, as he/she has a brother or a sister, compared with the first child. The evidence suggests that deprivation of parental care, rude parental treatment or parental hyperprotection lead to hyperintimate accentuation of personality and is the consequence of loss of interest and parents' control over the child, significant disorders of multiple spheres of child development [16].

The 49 children (43%) of the index group and 82 (39%) children of the comparison group had siblings ( $p = 0.4835$ ). The 78 (68%) children of the index group

and 153 (74%) children of the comparison group were first-born children in the family ( $p=0.2517$ ). The second 32 (28%) and 42 (20%) ( $p=0.1020$ ), the third or the forth - 5 (4%) and 13 (6%) ( $p=0.4424$ ) accordingly. There was one pair of twins among the children of the index group and one pair of triplets in the comparison group. children

Thus, one can state that currently the majority of families in our society bring up one child - 66 (57%) and 126 (61%). Attending different classes for children, sports groups also can be considered as "socialization" of the child of the early and preschool age. A cross-check questioning for parents of both groups was carried out. The parents, whose children went into kindergarten, were asked whether

their children attended extra sports classes or groups. While the parents of the children going into sports clubs, were asked which establishment attended their children - 30 (26%) children attended sports classes and groups, among the children of the football club for preschoolers - 164 (79%) went to the kindergartens, and 2 children additionally attended a "development center".

Child development. First of all, parents dream that their child becomes a harmoniously developed person. That is why it is very important to focus the attention of parents, medical professionals and teachers on the patterns of development of the child during his/her first years of life.

The comparative analysis of the main spheres of development of children of the study groups is shown in Table 1.

**Table 1**

**The analysis of development of 323 children of early and preschool age in the main spheres according to the data obtained with the parents questionnaire, abs.(%)**

Question	Index group n=115	Comparison group n=208	p
<b>Physical development</b>			
<b>Questions on the skills for the particular age</b>			
- hops in one place on both feet	115 (100)	204 (98)	0.4990
- leans forward and doesn't fall	113 (98)	203 (97.5)	0.5921
- steps over small barriers	115 (100)	208 (100)	1.0
- catches a ball with both hands	107 (93)	194 (93.2)	1.0
- climbs the ladder up and down without the help of adults	114 (99)	203 (97.5)	0.2505
- dresses/undresses himself/herself, cleans teeth without the help of adults	91 (79)	157 (75.4)	0.4180
<b>Questions on the skills which advance age</b>			
- fastens zippers, buttons, snap buttons without help	63 (54.4)	104 (50)	0.4915
- holds balance well: confidently walks along a plank, lying horizontally, or along the pavement	95 (82.6)	171 (82.2)	1.0
- confidently holds a pen/pencil in his/her hand	106 (92)	161 (77.4)	0.0008
<b>Cognitive (intellectual) development</b>			
<b>Questions on the skills for the particular age</b>			
- correctly names familiar colors	99 (86)	202 (97)	0.0002
- understands prime numbers and counts till five	93 (80)	199 (95.6)	0.0001
- can be separated from mom/dad/caregiver for the whole day without a problem	100 (87)	175 (84)	0.4694
- knows his/her close relatives and friends, in kindergarten calls his/her nursery teacher by name	97 (84.3)	193 (92.7)	0.0276
- recites small poems by heart	80 (69.5)	183 (87.9)	0.0001
- correctly answers the questions connected with the recent events (Where did you walk today? Who did you meet?)	96 (83.4)	189 (90.8)	0.0339
<b>Questions on the skills which advance age</b>			
- during the games willingly involves fantasy, develops the scenario of the game	86 (74)	181 (87)	0.0036
- can write his/her name, some numbers, letters.	27 (23.4)	52 (25)	0.6884
- understands the most simple cause and effect relationships (Why mom washes the clothes? Why does dad prepare a supper?).	91 (79.1)	188(90)	0.0066
<b>Social and emotional development</b>			
<b>Questions of the skills for particular age</b>			
- wants to help parents with everyday routine tasks (sweep the floor, collect all the toys in the box)	108 (93.9)	201 (96.6)	0.2401
- understands the meaning of "mine" and "his/hers"	111 (96.5)	190 (91.3)	0.0974
- inherits everything from parents and friends	109 (94.7)	171 (82)	0.0029
- takes on different social roles in games (imitation of adult actions in games)	86 (74.7)	198 (95)	0.0001
- able to feel such complicated emotions as insult, disappointment, shame, confusion	109 (94.7)	188 (90.3)	0.1182
- likes praise, longs to be praised	106 (92.1)	128 (61.5)	0.0001
<b>Questions on the skills, which advance age</b>			
- during the games shows himself/herself as a team member, negotiates with the members of his/her team	74 (64.3)	194 (93.2)	0.0001
- is familiar with the notion of sex	104 (90.4)	169 (81.2)	0.0345
- knows what rules are (in particular, the rules of the game)	76 (66)	26 (12.5)	0.0001

Thus, the motor skills in the children of both groups did not differ. It is quite understandable that parents are willing for a “rapid physical” development of their child and send him/her to the football club for preschoolers. But the advance in motor skills in comparison with the peers needs time.

We have analyzed the period of attending the football club for preschoolers by the children of comparison group and according to this, have carried out the analysis of the children development. The majority of children - 143 (69%) - have been attending the sports club for less than half a year ( $p < 0.001$ ). From 6 to 12 months the sports club was attended by 54 (26%) children, more than a year - 11 (5%) children. That's why for a more detailed analysis and collection of the evidence it is necessary to conduct the II stage of research, namely, the influence of the period of attending the football club for preschoolers on the child development.

But the first stage of the research defined that the frequency of the cognitive (intellectual) development was better in children going to the football club for preschoolers with the special coaching method.

It should be pointed out that the advance of social

and emotional development was observed only in children going to kindergartens.

### Conclusion

1. It was identified that physical development in children of the early and preschool age does not differ in children going to kindergartens or football club for preschoolers.

2. A statistically important frequency of advancement in cognitive (intellectual) development of the child was recorded among the children going to the football club for preschoolers.

3. An advancement in social and emotional development was recorded in children going only to kindergartens.

In perspective the further research dedicated to the study of development of children of the early and preschool age according to the period and frequency of going to the football club for preschoolers.

### Contributors

The first and second authors designed the study, performed the statistical analyses and wrote the manuscript. The third author was involved in data collection of the study. All authors contributed to and have approved the final manuscript.

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## РОЗВИТОК ЗДОРОВИХ ДІТЕЙ РАНЬОГО І ДОШКІЛЬНОГО ВІКУ В ХАРКОВІ: І ЧАСТИНА

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### Резюме

**Вступ.** Фізична активність і гра дуже важливі для нормального розвитку здібностей дитини, оскільки вони закладають основу для майбутніх здібностей дитини читати, писати, рахувати і здібностей творчого мислення. Гра, безсумнівно, впливає на всі аспекти розвитку дитини.

**Мета.** Оцінити розвиток дітей 3, 4 і 5 років, що проживають в Харкові і їхніх однолітків, які займаються футболом в футбольному клубі для дошкільнят «Footbik», на основі методу коучингу TOTAL SOCCER (Нідерланди).

**Методи.** Проспективне медичне і соціальне дослідження 323 дітей у віці від 2 до 4,5 років, що проживають у Харкові (115 з дитячих садів і 208 з секції зі спеціальною футбольною методикою). Проект дослідження включав розробку форм заяв, опитувальник для батьків дітей, створення бази даних і статистичну обробку отриманого матеріалу на основі STATISTICA 7.

**Результати.** Моторні навички у дітей обох груп не відрізнялися. Цілком зрозуміло, що батьки готові до «швидкого фізичного» розвитку своєї дитини і відправляють його у футбольний клуб для дошкільнят. Але просування в моторних навичках у порівнянні з однолітками вимагає часу.

Ми проаналізували період відвідувань футбольного клубу для дошкільнят дітьми групи порівняння і відповідно до цього провели аналіз розвитку дітей. Більшість дітей - 143 (69%) - відвідують спортивний клуб менш ніж півроку ( $p < 0,001$ ). З 6 до 12 місяців в спортивному клубі взяли участь 54 (26%) дітей, понад рік - 11 (5%) дітей. Ось чому для більш детального аналізу і збору доказів необхідно провести II етап досліджень, а саме вплив періоду відвідування футбольного клубу для дошкільнят на розвиток дитини. Наш етап дослідження визначив, що частота пізнавального (інтелектуального) розвитку була краще у дітей, які вирушають у футбольний клуб для дошкільнят за допомогою спеціального методу коучингу. Слід зазначити, що розвиток соціального і емоційного розвитку спостерігалося тільки у дітей, які відвідують дитячі садки.

**Висновки.** Було встановлено, що фізичний розвиток у дітей раннього та дошкільного віку не відрізняється у дітей, які відвідують дитячі садки або футбольний клуб для дошкільнят. Статистично важлива частота просування в пізнавальному (інтелектуальному) розвитку дитини була відзначена серед дітей, які відвідують футбольний клуб для дошкільнят. У дітей, які відвідують дитячі садки, відзначалося поліпшення соціального і емоційного розвитку.

**Ключові слова:** діти; дошкільний вік; розвиток; коучинг.

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## РАЗВИТИЕ ЗДОРОВЫХ ДЕТЕЙ РАННЕГО И ДОШКОЛЬНОГО ВОЗРАСТА В ХАРЬКОВЕ: І ЧАСТЬ

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### Summary

**Введение.** Физическая активность и игры очень важны для нормального развития способностей ребенка, поскольку они закладывают основу для будущих способностей ребенка читать, писать, считать и способностей творческого мышления. Игра, несомненно, влияет на все аспекты развития ребенка.

**Цель:** Оценить развитие детей 3, 4 и 5 лет, проживающих в Харькове и их сверстников, которые занимаются футболом в футбольном клубе для дошкольников «Footbik», на основе метода коучинга TOTAL SOCCER (Нидерланды).

**Методы.** Проспективное медицинское и социальное исследование 323 детей в возрасте от 2 до 4,5 лет, проживающих в Харькове (115 из детских садов и 208 из секции со специальной футбольной методикой). Проект исследования включал разработку форм заяв, вопросник для родителей детей, создание базы данных и статистическую обработку полученного материала на основе STATISTICA 7.

**Результаты.** Моторные навыки у детей обеих групп не отличались. Вполне понятно, что родители готовы к «быстрому физическому» развитию своего ребенка и отправляют его в футбольный клуб для дошкольников. Но продвижение в моторных навыках по сравнению со сверстниками требует времени.

Мы проанализировали период посещения футбольного клуба для дошкольников детьми группы сравнения и в соответствии с этим провели анализ развития детей. Большинство детей - 143 (69%) - посещают спортивный клуб менее чем полгода ( $p < 0,001$ ). С 6 до 12 месяцев в спортивном клубе приняли участие 54 (26%) детей, более года - 11 (5%) детей. Вот почему для более детального анализа и сбора доказательств необходимо провести II этап исследования, а именно влияние периода посещения футбольного клуба для дошкольников на развитие ребенка. Наш этап исследования определил, что частота познавательного (интеллектуального) развития была лучше у детей, отправляющихся в футбольный клуб для дошкольников с помощью специального метода коучинга. Следует отметить, что развитие социального и эмоционального развития наблюдалось только у детей, посещающих детские сады.

**Выводы.** Было установлено, что физическое развитие у детей раннего и дошкольного возраста не отличается у детей, посещающих детские сады или футбольный клуб для дошкольников. Статистически важная частота продвижения в познавательном (интеллектуальном) развитии ребенка была отмечена среди детей, посещающих футбольный клуб для дошкольников. У детей, посещающих детские сады, отмечалось улучшение социального и эмоционального развития.

**Ключевые слова:** дети; дошкольный возраст; развитие; коучинг.



ISSN 2226-1230 (Print)  
ISSN 2413-4260 (Online)

# НЕОНАТОЛОГІЯ, ХІРУРГІЯ ТА ПЕРИНАТАЛЬНА МЕДИЦИНА

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## NEONATOLOGY, SURGERY AND PERINATAL MEDICINE

T. VIII, № 3(29), 2018





## РЕЗУЛЬТАТИ ДИСЕРТАЦІЙНИХ ТА НАУКОВО – ДОСЛІДНИХ РОБІТ / RESULTS THESIS AND SCIENTIFIC-RESEARCH

UDC: 613.954(477.54)

DOI: 10.24061/2413-4260.VIII.3.29.2018.3

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DEVELOPMENT OF TODDLERS AND  
PRESCHOOL CHILDREN IN KHARKIV  
RESULTS OF THE SECOND STAGE OF  
RESEARCH

**Резюме:** The article describes the aspects of studying the development of children of early and preschool age in Kharkiv city. The definition of motor and adaptive development of children of early and preschool age who visited the sports section through a special method was conducted by questioning 66 parents and 60 parents of children who visited only kindergartens. The average time spent visiting the sports section in the cohort was 110 hours, so the abilities were determined based on the length of visits in the last 1-1.5 years, as less than 110 hours and more than 110 hours. The questionnaire was developed on the basis of the recommendations of the American Academy of Pediatrics "Council on Children with Disabilities". It has been established that children who attended the sports section for more than 110 hours had a breakthrough from several positions in motor development and from all positions of adaptive development, that is, self-service skills. Taking into account the previous stage I of the study, the authors suggest that the active involvement of the child in a sports section by a special methodology leads not only to improving motor skills, but also contributes to the mental development and development of self-service skills.

**Key words:** Children of Early and Preschool Age; Development.

In order to define the influence of sports clubs with European methods of coaching on the development of toddlers and preschool children it was planned to carry out two stages of research: stage I – comparative characteristics of the children between 2 and 4.5 years, living in Kharkiv and going to ordinary child care centers or sport clubs during 2016-2017 and stage II – definition of the influence of duration and frequency of attending the sports club, using European methods of coaching during 2017-2018 on the child development.

For stage I of research an adapted application form for parents of 323 children (115 children from preschools of Kharkiv and 218 from the sports club) was used, based on the information materials on the child development of Government of Western Australia, Department of Health for children of 3-4 years [1] and 4-5 years [2]. Cognitive, motor, social and emotional development was studied. The results of stage I of research showed that the development of motor skills in toddlers and preschool children does not depend on the fact whether the child goes to a kindergarten or to a sports club (OR=1.02; 95% CI 0.55 – 1.89). Among the children attending

sports club statistically significant frequency of advance of cognitive (mental) development was recorded (OR=3.2; 95% CI 1.7 – 5.76), and among the children, going only to kindergartens, an advance in social and emotional development was recorded (OR=7.36; 95% CI 3.4 – 15.6). In our opinion, the trajectory of development of the children attending the sports club "Footbik", based on the coaching method TOTAL SOCCER METHOD (the Netherlands) depending on the duration and frequency of attending is interesting, which defined the objective of stage II of research of development of toddlers and preschool children of Kharkiv [3].

### Materials and methods of research

The research design included development of application forms, interviewing parents, creation of databases and statistical analysis of the received data. In order to create the application form, the original recommendations of American Academy of Pediatrics «Council on Children with Disabilities» with the detailed description of the main developmental milestones of children from 0 to 7 years (Fig.1) was used [4, 5].

Table 1

### Questions to define the motor and adaptive development of toddlers and preschool children

Motor development	Adaptive development
- hops on one foot	- eats independently
- bends over without falling	- puts on shoes
- steps over small barriers	- unbuttons
- catches ball, arms stiff	- toilet trained
- goes upstairs and downstairs without support	- washes face and hands
- can dress or take off clothes independently, brushes teeth alone	- brushes teeth alone
- fastens zippers, buttons, snap buttons independently	- uses fork well
- balances well: walks on balance beam	- buttons and unbuttons

Table 1

- confidently holds a pen in his/her hand	- spreads with knife
- balances on one foot: four to eight seconds	- independent dressing
- hops on one foot: two to three times	- bathes independently
- catches bounced ball	- ties shoes
- walks downstairs, alternating feet	- combs hair
- balances on one foot: more than eight seconds	- looks both ways at street
- walks backward heel-toe	- remembers to bring belongings
- jumps backward	
- walks on a ruler (wire) lying on the floor	
- rides bicycle independently	

Motor domain has been studied, namely, its correspondence to the biological age of the child, advances in motor development in the general cohort of children and depending on the duration of attending the sports club, i.e. the number of responses peculiar to children 1-1.5 years older were determined. Due to the fact that stage I did not include the assessment of the adaptive development (self help), the given domain was studied separately.

Motor and adaptive development was studied in accordance with the duration of attending the sports club in hours. The average value of this index was 110 hours. Therefore, all the children were divided into the groups: group 1 – children, having attended the sports club for 110 hours or less (min – 44; max – 110), (n=37); group 2 – children, having attended the sports club for more than 110 hours (min – 111; max – 191); (n=29).

Just as in stage I of research, the medical domain was studied.

The selection of parents for the survey was carried out using the general base of the sports club, from those who regularly or relatively regularly attended it. The survey of the parents, whose children went to the kindergarten, was carried out with the parents who took part in the first stage of the research.

The parents of 126 children were interviewed (66 children going to sports club “Footbik”, based on the TOTAL SOCCER coaching method (the Netherlands) and 60 children going only to Kharkiv kindergartens) by verbal consent. For the statistic analysis of the obtained data of the survey, a database with the number of observations for each response was created (EXCEL FOR WINDOWS). Statistical analysis of the obtained data was carried out with the help of STATISTICA 7 program. In order to compare sample values, a method of angular transformation with estimation of F-criterion was employed. The difference in parameters, which were compared according to two values, was considered statistically significant in  $p < 0.05$ .

For the factors possessing statistical significance ( $p < 0.05$ ) logistic regression analysis and Odds ratio (OR) of occurrence of the event were used, 95% confidence interval was defined,  $\chi^2$  criterion, used for comparing the observed results with those expected, to decide whether the original hypothesis was justified [6].

### Results and their discussion:

The average age of children from the sports club comprised 4.8 (min – 3.5; max – 5.9) years and did not differ from the average age of the children

going to the kindergarten – 4.9 (min – 3.11; max – 5.9) years ( $p > 0.05$ ). The average age of both groups did not differ – 4.8 (min – 3.5; max – 5.9) years in the children of group 1 and 4.8 (min – 4; max – 5.7) years in the children of group 2 ( $p > 0.05$ ).

The respondents were mostly mothers. In kindergartens the application forms were filled by 100% of mothers, in the sports club by 77.2% ( $p = 0.0002$ ). To the sports club the children were taken by their carers and fathers.

Medical domain.

As in the previous stage of the research no significant differences between the indices of physical development of children (height and body mass) among the children going to the sports club and the children going to kindergartens were defined. Parents of 35 (53%) children going to the sports club mentioned that their children were absolutely healthy. Among the rest – in 6 (9.0%) children parents mentioned the presence of chronic diseases and in 25 (37.8%) frequent acute respiratory infections. Parents of 39 (65%) children from kindergartens considered their children to be absolutely healthy ( $p = 0.1743$ ), 4 (6.6%) children presented with chronic diseases ( $p = 0.6809$ ), and 17 (28.3%) – frequent acute respiratory infections ( $p = 0.2363$ ). Thus, according to the general frequency of diseases the identical results were obtained.

Development of motor skills.

The data containing statistical significance among the questions showing advances in motor skills development was obtained when the child attended the sports club for more than 110 hours.

Thus, for example, the question characterizing development of fine motor skills “fastens zippers, buttons, snap buttons independently” contained positive responses in 24 (64.0%) children of group 1 and in 26 (89.65) children of group 2 ( $p = 0.0477$ ). It is known that development of fine motor skills is connected with development of cognitive (mental) domain, which was shown by stage I of the research.

The question concerning the skill “rides bicycle independently” is inherent to children of 6-6.5 years [4, 5]. Positive response to the question concerning advances in gross motor development was given by parents of 23 (62.1%) children of group 1 and 26 (89.9%) children of group 2 ( $p = 0.0121$ ).

Thus, if a child goes to the sports club for more than 110 hours, the advance in fine motor skills development increases 4.6 times (OR=4.6; 95% CI 1.2 – 19.0), and advances in gross motor skills development increase 5.2 times (OR=5.2; 95% CI 1.3 – 21.3).

## Adaptive development of children

Self-help skills according to the questions asked to the children of the corresponding age did not have any differences among the children going to the sports club or kindergarten. But to the question concerning the advances of adaptive development, the parents of children going to sports club, gave positive responses more frequently. That's why intra-group analysis of the given questions among the parents depending on the duration of attending the sports club, i.e. among the groups 1 and 2, was carried out.

Thus, the question concerning the skills "combs hair independently", inherent to the children of 6-6.5 years, 27 (72.9%) parents of children of group 1 and 27 (93.1%) of parents of children of group 2 ( $p=0.0332$ ) gave positive responses. To the question concerning the skill inherent to children of 6-6.5 years "looks both ways at street" positive responses were given by the same number of parents: 27 (72.9%) children of group 1 and 27 (93.1%) children of group 2 ( $p=0.0332$ ). To the question concerning the skill inherent to the children of 6-6.5 years "remembers to bring belongings" positive responses were given by 27 (72.9%) parents of children of group 1 and 27 (93.1%) parents of children of group 2 ( $p=0.0332$ ).

Thus, if a child goes to the sports club for more than 110 hours a chance to have advance in adaptive development (self-help skills) increases 5 times ( $OR=5$ ; 95% CI 1.06 – 25.0).

In Ukraine, under the conditions of absence of screenings and scales of development for toddlers accepted by the Ministry of Health Care, adapted

questionnaires help not only to detect delays in the main domains of development in children (cognitive, motor, language, social and emotional and adaptive), but also advances in development, to analyze development of children from different groups and different age [7, 8, 9].

## Conclusions:

1. The second stage of research of development of toddlers and preschool children, defined particular differences in motor and adaptive development in regular attendance of sports club.

2. Children going to the sports club for more than 110 hours during the time period of 1-1.5 years showed a better development of fine motor skills, increased 4.6 times ( $OR=4.6$ ; 95% CI 1.2 – 19.0), and advances in development of gross motor skills - in 5.2 times ( $OR=5.2$ ; 95% CI 1.3 – 21.3).

3. Advances in development of self-help skills are also present among the children attending the sports club during a long period of time, 5 times more ( $OR=5$ ; 95% CI 1.06 – 25.0).

4. Taking into account the results of the previous stage of the research (stage I), namely, advances in cognitive (mental) development of children going to the sports club in 3.2 times, it can be said that active development of motor skills due to attending sports club with special methods, is accompanied by improvement of cognitive (mental) development and adaptive development (self-help skills) of the child.

**Conflict of interest.** None any.

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## РОЗВИТОК ЗДОРОВИХ ДІТЕЙ РАНЬОГО ТА ДОШКІЛЬНОГО ВІКУ м. ХАРКОВА. РЕЗУЛЬТАТИ ДРУГОГО ЕТАПУ ДОСЛІДЖЕННЯ

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## Резюме

У статті зображені аспекти дослідження сфер розвитку дітей раннього та дошкільного віку м. Харкова. Проводилося визначення моторного та адаптивного розвитку дітей раннього та дошкільного віку, які відвідували спортивну секцію за спеціальною методикою шляхом опитування 66 батьків та 60 дітей, які відвідували лише дитячі садочки. Середній час відвідувань спортивної секції в когорті був 110 годин, тому набуті навички визна-

## РАЗВИТИЕ ЗДОРОВЫХ ДЕТЕЙ РАННЕГО И ДОШКОЛЬНОГО ВОЗРАСТА ХАРЬКОВА. РЕЗУЛЬТАТЫ ВТОРОГО ЭТАПА ИССЛЕДОВАНИЯ

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## Summary

В статье отражены аспекты исследования сфер развития детей раннего и дошкольного возраста г. Харькова. Проводилось определение моторного и адаптивного развития детей раннего и дошкольного возраста, посещающих спортивную секцию по специальной методике путем опроса 66 родителей и 60 родителей детей, которые посещали только детские сады. Среднее время посещения спортивной секции в когорте было 110 ча-



чали залежно від тривалості відвідувань за останні 1-1,5 роки - як менше 110 годин та понад 110 годин. Анкету було розроблено на основі рекомендацій Американської академії педіатрії «Council on Children with Disabilities».

Встановлено, що діти, які відвідували спортивну секцію понад 110 годин, мали випередження з декількох позицій моторного розвитку та з усіх позицій адаптивного розвитку, тобто навичок самообслуговування. З урахуванням попереднього I етапу дослідження автори припускають, що активне залучення дитини до спортивної секції за спеціальною методикою призводить не лише до покращень моторних навичок, а й сприяє розумовому розвитку та розвитку навичок самообслуговування.

**Ключові слова:** діти раннього та дошкільного віку; розвиток.

сов, поэтому приобретенные навыки определяли в зависимости от продолжительности посещений за последние 1-1,5 года - как менее 110 часов и более 110 часов. Анкета была разработана на основе рекомендаций Американской академии педиатрии «Council on Children with Disabilities». Установлено, что дети, посещавшие спортивную секцию более 110 часов, имели опережение в нескольких позициях моторного развития и по всем позициям адаптивного развития, то есть навыков самообслуживания. С учетом предыдущего I этапа исследования авторы предполагают, что активное привлечение ребенка в спортивную секцию по специальной методике приводит не только к улучшению моторных навыков, но и способствует умственному развитию и развитию навыков самообслуживания.

**Ключевые слова:** дети раннего и дошкольного возраста, развитие.

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Надійшло до редакції 14.02.2018  
Підписано до друку 15.06.2018