

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

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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 1 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

<i>Motor development</i>	<i>Adaptive development</i>
- 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
- 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.

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## РОЗВИТОК ЗДОРОВИХ ДІТЕЙ РАННЬОГО ТА ДОШКІЛЬНОГО ВІКУ

### М.ХАРКОВА. РЕЗУЛЬТАТИ ДРУГОГО ЕТАПУ ДОСЛІДЖЕННЯ

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В статті відображені 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 батьків дітей, які відвідували лише дитячі садочки. Середній час відвідувань спортивної секції в когорті був 110 годин, тому набуті навички визначали в залежності 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



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

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В статье отражены аспекты исследования сфер развития детей раннего и дошкольного возраста 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 был 110 часов, поэтому приобретенные навыки определяли в зависимости от продолжительности посещения за последние 1-1,5 года, как менее 110 часов, так и более 110 часов. Анкету был разработан на основе рекомендаций Американской академии педиатрии «Council on Children with Disabilities». Установлено, что дети, которые посещали спортивную секцию более 110 часов имели опережение в нескольких позиций 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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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