



Role of the Handball at School Programme in Everyday Physical Education

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Abstract

In Hungary considerable education-policy changes have been implemented concerning school PE since everyday PE lessons were introduced the necessity and topicality of which is unquestionable. In this process Handball in School program was also introduced the ability developing role of which was examined by us. A survey programme was organised by us in the autumn and spring semesters of 2015/ 2016 academic year aiming to prove that project Handball at School proved to be positive on aiming accuracy and performance stability results of students, as well as their precision of technical implementation. 183 students were examined (2-4 grades) who had two sponge-handball lessons a week out of their 5 PE lessons. To examine aiming accuracy two tests were applied. One of them implied throwing at a target from throwing straddle without previous swing performed by the students by age-specific sponge-handball from distances corresponding their age. The other test for checking aiming accuracy was throwing at a target from throwing straddle with previous swing. At this test also surety, performance time and precision of technical implementation of upper shot were noted. It can be stated that aiming accuracy, its technical implementation and time needed for the implementation developed at both boys and girls compared to the autumn measurement when checked at spring (the difference was significant). The programme made bigger impetus on the results of the girls.

Keywords: handball, PE, primary school children

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Introduction

In Hungary important educational changes in school PE were implemented when introducing every-day PE, the necessity and topicality of which is unquestionable. The increase in the number of physical PE has been verified by the worrying health tendencies experienced among children and young people.

Physical activity is one of the most significant factors with preventive power to retain health therefore it is worrying that those people's proportion is very high that never do any sports or do not do exercises sufficiently (Moravec & Major, 2017).

Since health damaging effects of sedentary lifestyle make their impact already in young, school age, it is important to take various preventive steps. Having everyday PE been introduced it is a great tool for it, as motion is a possible means of preserving physical and mental wellbeing (Biro, 2015). Introduction of everyday PE was on purpose, as data reporting about the health state of the population made it inambiguous that it is indispensable to stop physical deterioration of the nation.

In the past years several studies have dealt with positive impact of PE, motion on health and it has been proven that motion has many-sided positive effects on human body. They have justified its positive effects on prevention and rehabilitation of the most widespread diseases (coronary- and heart diseases, certain types of cancer, second type of diabetes, etc.) (Piko & Keresztes, 2007; Somhegyi & Nanszakne, 2006; Kiss, 2003; Bagdy, 2007), and also diseases connected to brain functions (stroke, Alzheimer and Parkinson syndrome) (Radak et al, 2007; Szabo, 2010; Radak et al, 2011), as well as it contributes to the mental and subjective welfare (Băltătescu & Kovacs 2012, 2013; Kovacs, 2012; 2014; 2015; Kovacs & Perenyi, 2014; Dinyane & Pusztai 2016; Pusztai 2016; Pusztai et al, 2016; Pfau 2015). Recently more and more children have been affected by obesity and its prevalence in preventing and solving of which decreasing body-weight exercise plays important role (Lopez & Hynes, 2006; Janssen et al, 2005).

Activity at the PE lesson plays outstanding role also in developing abilities, concentration, memory and mental performance of the students (Tomprowski et al, 2008; Trudeau & Shephard, 2008). Several studies deal with many-sided effects of PE, its positive results on cognitive function. Cognitive abilities, concentration, memory, verbal skills, attitudes, performance in education and also understanding, attention and discipline in classroom get better as well (CDC 2010).

The objective of school PE and sport is versatile personality development, enhancement of healthy physical and mental development the tool of which is the motion material of sport, this way of handball as well. The movement material, the wide repertoire of handball sport develops motorous skills, coordination, concentration, it is varied, has positive effects on cognitive, emotional, motorous abilities and learning mechanisms in direct and indirect ways. The joint activity done in a team helps shaping relationships, social

behaviour, improves interpersonal connections, enhances socialisation. Harmonisation of defence and attack demands paying attention to each other, cooperation from the students, this way social relationships, tolerance, attention and concentration develop properly. During matches processing success and failure can also be realized, self-control, persistence, will-power, competitiveness, tolerance of pain also develop and real self-assessment can be shaped. These features are all indispensable for fitting into the society, for creating optimal conditions for personal life and welfare.

Recently education has changed a lot, this way contentual and methodological aspects of public education have also got altered. It is proven by the continual modification of the curricula (1995–NAT1, 2003–NAT2, 2007–NAT3, 2012–NAT4). The latest National Basic Curriculum (NAT) was passed by the government on 4. June 2012 based on Government order 110/2012. (VI. 4.), where different aspects of educational objectives were expressed, like physical and mental health education. Organising and ensuring every-day PE, that is having 5 PE lessons a week in full-time education is imposed mandatory by Act 27.§. Beginning from 2012/2013 academic year every-day PE is compulsory in 1., 5. and 9. classes, then it will be in all classes in phasing-out system.

Beginning from 2015/2016 academic year every-day PE has become general. To fulfil the principles and objectives skills must be acquired in game and sports culture and it is essential to create needs for healthy and health-centered activities. Objectives of school PE are as follows: knowledge of the sport, developing, enlarging movement skills, participation in freetime and sports events, creating values based on regular PE and healthy lifestyle. Lot of research focussed on the every-day P.E (Fintor, 2016; Fintor, 2017; Borbely & Fonai, 2016).

Handball at School project got involved in this favourable education-political environment, enriching the educational content with the specific movement material of the target group, ball-skills developing exercises of handball on a weekly basis out of the five PE lessons.

The framework curricula made to the project was published in Magyar Kozlony 2016. year 126. issue 5. attachment 22/2016.(VIII.25) EMMI order, supporting the organisational work of teachers.

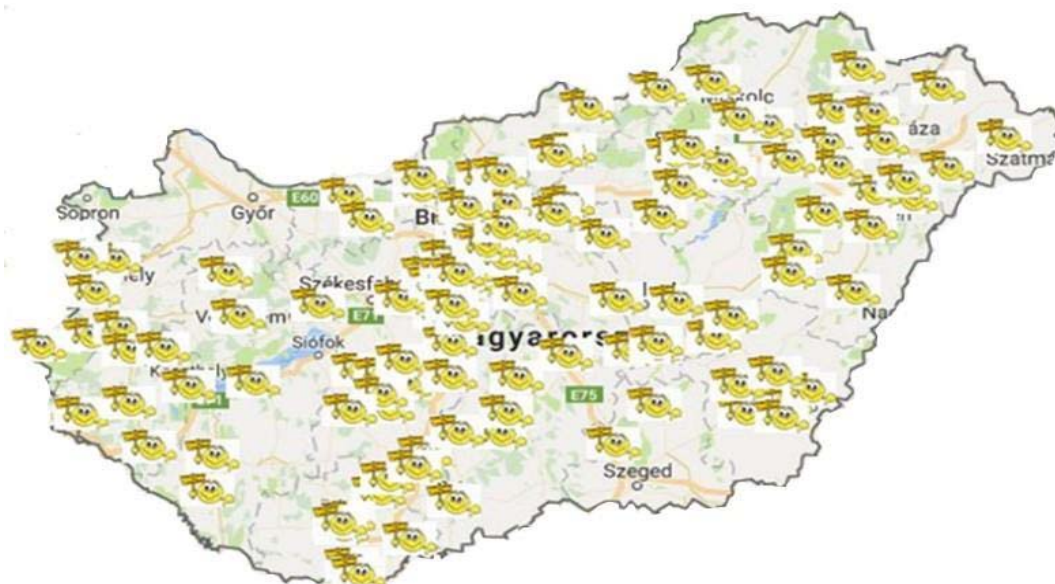
Description of Handball at School Programmes

Hungarian Handball Association launched its Handball at School project in September 2013 in 50 schools, with 54 PE teachers, 1430 students. Thanks to the favourable experience the programme was enlarged in September 2014 to 91 schools and 98 PE teachers, this way growing the number of the children to 3400. At present – due to further enlargement in 2015 – the programme is going on in 117 schools, with 127 PE teachers, with participation of almost 4565 students (1-8. grades) in 243 groups. Out of all the participants 1435 students are in 2-4. classes. The programme and the schools

participating in it have become a dominant scene of talent care besides enlarging youth supply base of handball.

In 2016/2017 academic year further expansion could be experienced due to popularity since now, in the programme 4924 students have been registered from 120 schools who are educated by 128 PE teachers. Teachers participating in the program must have ICT competency as an electronic interface should be used for documentation. ICT competence is an element of competitiveness in the labor market (Czegledi, 2007; Czegledi, 2016; Rathonyi-Odor et al 2015; Dajnoki et al, 2015; Pfau, 2015). Both the programme and the participated schools are one of the stages of determining talent promotion besides enlarging the basis of handballers' recruitment. Therefore, on the map of Hungary the number of schools taken part in this programme got increased.

Figure 1. From September 2017 the regional distribution of the schools participated Handball at School programme in Hungary



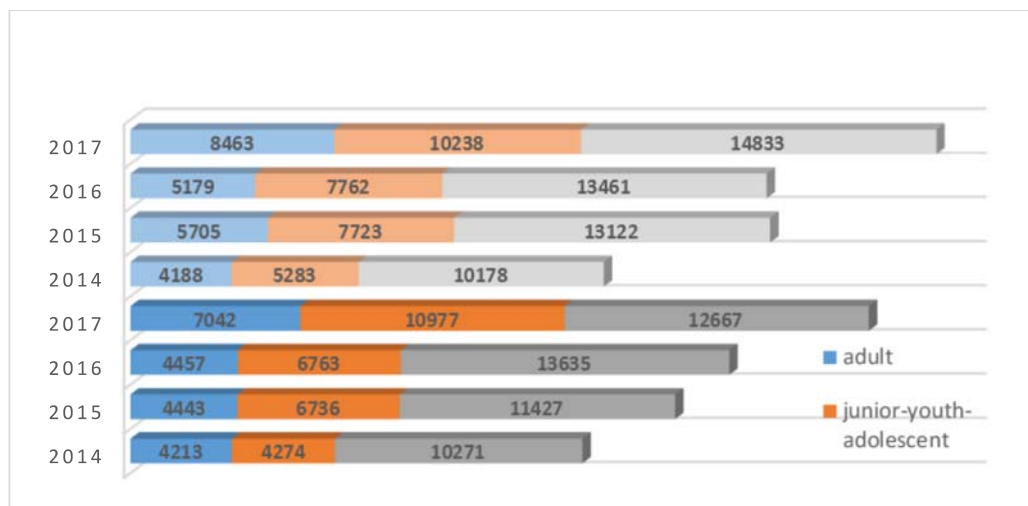
The map (Figure 1.) illustrates well that not only Budapest but Western and Eastern Hungary get also involved in the programme. A big amount of small municipalities even the disadvantaged areas were also involved in the programme, which can improve the disadvantaged students' chances to be able to engage in the quality education.

Since 2017 a so called School Festival has been launched the objectives of which were to compete the internal network of Handball at School programme, take care of sports relations among the participating schools, ensure the experienced-oriented competition or enlarge the school background of handball.

The PE teachers' professional support taken part in the programme is continuous on behalf of Hungarian Handball Association since it helps the participants with specialised materials, accredited trainings made for teachers, continuous assistance and surveillance of the system as well as research.

This programme facilitates the implement of every-day PE in the school life as well as it contributes to ensure the basis of the Hungarian handballers' recruitment. By implementing the corporation tax allowance system, so called TAO (Bacs & Bacsne, 2014) (support of team sports involving handball, too) the number of handball players and children in recruitment was increased significantly (illustrated in the figure 2.).

Figure 2. Hungary 2014-2017 the number of registered handball players listed by sex and age group (individual)



As outlined handball gets more and more popular among children, more and more children choose this sport and become registered players in which Handball at School programme has also a great role since providing of its popularity, massification and conditionality contributed to increase the number.

The junior section pupils of the schools (2-4. classes) participating in the programme learn basic technical tactical elements, system of rules of handball, sport twice a week within every-day PE and do various ball exercises (to develop skills and dexterity) with light tool (sponge handball) and playful competitions within the lesson. The PE teachers taking part in the education of the programme are trained by the Hungarian Handball Federation and the schools are supplied with the necessary sports equipment. The results are controlled by the mentor system and by surveying the lesson plans sent by the teachers. This programme provides professional supervision, continuous training and check-up this way it is exceptional in our country. Although a package and retraining of professionals was ensured in the Hungarian programme of kid-athletics, however, the feedback, the continuous control was not fulfilled as thoroughly as in the school programme of handball, therefore it can be considered unique.

Literature Review

The literature around handball has tended to focus on aspects of physical performance in adults. Resistance training, relative fitness, general and specific physical and physiological characteristics have been investigated with regards to handball players' performances (Marques & Gonzalez-Badillo, 2006; Granados et al, 2007; Nikolaidis & Ingebrigtsen,

2013; Gurhan et al, 2016; Konig et al, 2017; Konig & Okros, 2016; Okros, 2016). In further studies of fitness and physical characteristics of handball players, Schweisig et al's work (2016a; 2016b) focused on validating handball specific tests but excluded any consideration of skills related with testing. In addition to adult research, studies have also been undertaken in relation to the measurement of school-age children. However, in common with adult based investigations, research with children has tended to be related to fitness and physical characteristics (Ingebrigtsen & Jeffreys, 2012; Karadenizli, 2016; Kayapinar et al., 2015; Ingebrigtsen, Rodahl & Jeffreys, 2013). Work by Ion (2015) has identified beneficial influences of handball participation on motoric skills development of children.

Questions

Before starting our research the following questions were asked since we tried to find the answer for our research:

- Which tests and procedures examine the major conditional and coordinating skills which are suitable to help selection process of junior section pupils in handball sport?
- How will Handball at School project change the sport-specific coordination abilities of the students of different age, gender or pre-training?
- How will target accuracy change in the implementation of the movement of the students of different age, gender or pre-training?
- How will target accuracy of students taking part in the survey change due to the project during the year? Which parameters mostly changed by the autumn and spring?

Hypothesis

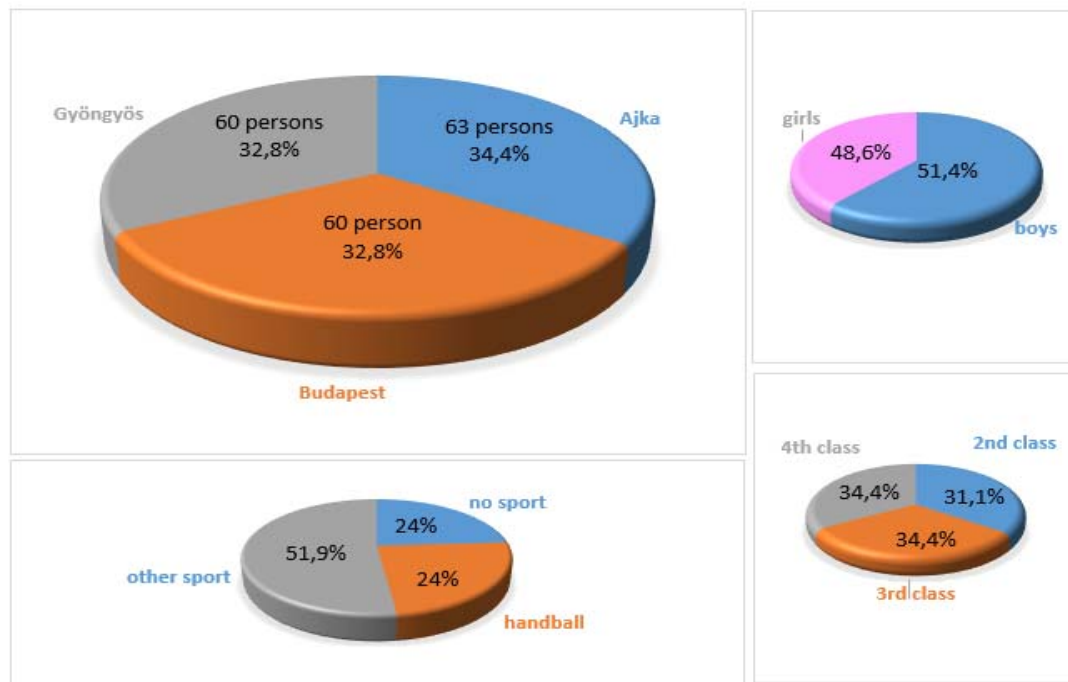
- We consider that tests to check and examine conditional and coordinational skills, sports-specific tests must be approached in holistic way when finding talents for a sport in junior school age.
- We presume that Handball at School project will have different effect on the sport-specific coordination abilities of the students of different age, gender and pre-training.
- We presume that considering genders there will be bigger development for girls in handball sport specific coordination tests.

Sample

Our survey was organised in three schools in autumn and spring, 2015. Primary school students of 2. and 4. classes had 5 PE lessons a week out of which 2 lessons were spent on acquiring the knowledge of handball sport. They were surveyed in Budapest, Tomori Pal Elementary School, Ajka, Fekete-Vorosmarty Elementary School and Gyongyos, Kalvariaparti Elementary School. These schools joined the programme on 1 of September

2013, the teachers were well-trained professionals, PE teachers had big experience in teaching handball as well. The pupils were chosen in 2015-16 academic year at least 10 % of all the children of the junior section took part in the programme. Out of 1430 pupils of the junior section, 183 took part in the survey, that is 12,8 % of it. The locations were chosen so that from Western and Eastern Hungary and a school from the capital city were in the sample, so all the regions of Hungary were represented.

Figure 3. Percentage of the samples by location, gender, age and sporting habits



Material and Methods

To test the survey material pilot measurements were done in Ozd, Vasvari Street Primary School, to make sure the test material offered for the survey matched the abilities of the age group and to get information about the feasibility of the exercises and general and special technical level – related to the tasks - of the students of different age and pre-training. This school was chosen to have the location where underprivileged children could also be tested and the venue was suitable to play sponge-handball.

During the pilot research alterations were made in the previously suggested material, since the 1. and 2. class pupils could not perform the 2. task (Alternate hand dribble with ball) even at basic level in alternative way. Therefore the above mentioned age group had to perform this task only with one hand (on the dominant side) during the survey. (Evaluation of this task will be published in a future article.)

Besides this – as the pilot test was done at the beginning of the school year -, the 1. class pupils could not be surveyed, since even understanding the task caused serious problems

for them as lacking pre-training, they had never faced such kind of movement nor material.

It can be seen in the chart that there were about the same proportion of children from all the three locations. 94 students (51.4 %) of the measured junior section children were boys, while 89 students (48.6 %) were girls. The surveyed ones came from 2., 3. and 4. classes, with about the same proportion: 63 students (34.4 %) 2. class, 57 students (31.1 %) 3. class, and 63 students (34.4 %) 4. class (Figure 3.)

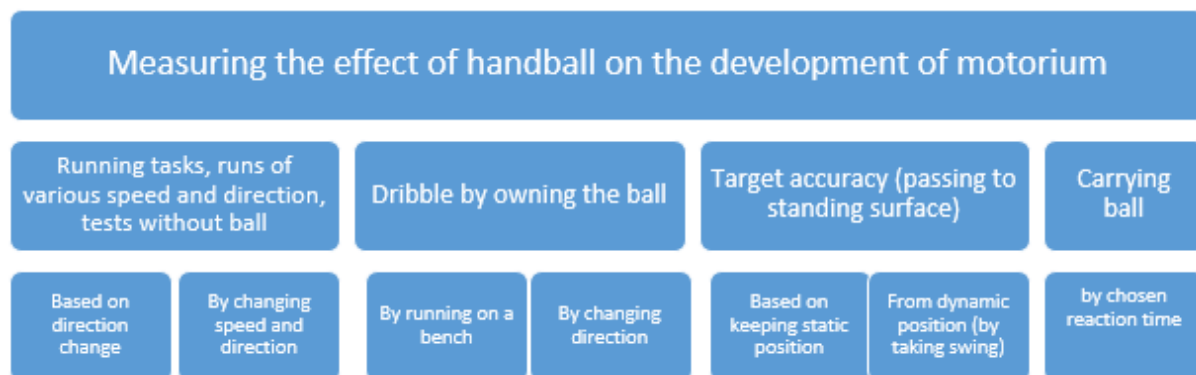
44 students (24 %) of the surveyed children do not do any sport other than PE lesson, also 44 students (24 %) were the ones who chose handball sport for their afternoon trainings, while 95 of all the students (51.9 %) also practiced it at training in the afternoon, however they did not focus on handball (figure 3.). 66 % of the students took part in one-two trainings a week, while 33.9 % attended more than two trainings a week. 44 of the students (24 %) children surveyed in the programme and did not do sport either at school or at a club, 88 students (88 %) did sport at association, while 53 students (29 %) had sports activities at school.

The children surveyed in the sample were grouped by decimal age categories. In the autumn survey, the dominance of 10 year old children was noticed, making 34.4 % of the surveyed ones, the group of the 9 year old students was just 30.6 % of the sample, 8 year old students were 25.7 % of the sample, 11 year old children were 4.4 %, while 6 and 7 year old children took only 5.0 % of the sample.

The Features and Positions Surveyed

Movement accuracy is a very complex category in handball, therefore we tried to examine it through different factors, in order to be able to give a complex summary on them later.

Figure 4. Structure of tests surveyed



In our present article the results of our two surveys to test aiming accuracy are described. Therefore, the description of these tests and their evaluation is also shown in details.

Shooting in transversal straddle position without running up (to survey sports specific coordination skills)

The pupils stood behind the line on the floor, 5 sponge-handballs adequate to their age were placed in a turned-up small box on the side of their throwing hand (see test 2.) A small box (dimension: 26 cm tall, 62 cm long, 42 cm wide) was placed 5.5 meters away in case of 1-2. class students and 6 meters away in case of 3-4. class students in the way that the surface covered in leather faced the pupil performing the shot. The student heard the whistle, targeted the surface of the small box with the balls having taken from the small box near him so that the ball hit it with a direct touch. It was performed with upper throw (position of elbow: level of the shoulder or over of the shoulder).

The number of attempts were 5, at the survey the number of scores, the time of implementation (with digital watch, sec. – centi-seconds accuracy) were taken and accuracy index was counted (average/deviation).

Shooting in transversal straddle position with running up (to survey sports specific coordination skills)

The pupils stood behind the line on the floor, (The distance of the line and the target surface was the same as in test 5). 5 sponge-handballs adequate to their age were placed in a turned-up small box on the side of their throwing hand (see test 2.) The student heard the whistle, had to run back to the small box, take a ball out of it and had to run to the line and similarly to task 5, had to target the small box. He had to repeat it as long as he used all the 5 balls. It was performed with upper throw (position of elbow: level of the shoulder or over of the shoulder).

The number of attempts were 5, at measuring the number of scores, the time of implementation (with digital watch, sec. – centi-seconds accuracy) were taken and accuracy index was counted (average/deviation).

The Way of Calculation

The results of the trials applied in the survey were expressed in quantitative way. The data were processed with SPSS.22.0 statistical programme. The results were processed and evaluated following mathematical basic statistics survey procedures.

Based on the instructions of handbook Introduction to the Methodology of Scientific Research the population was grouped then averaged and deviated, used median and modus were counted with basic statistic methods. The correlation survey was done with a two-sample t-probe to show the difference between the groups or difference between the autumn and spring values.

Results

Implementation of shooting in transversal straddle position without running up, from stabil position is a task which can be expected from and can be performed by school children of junior age, since it is practised not only when being taught with sponge-

handball, but small ball throw and throw as part of the natural exercises of athletics in the curriculum, it appears in school PE games (dodgeball) or even in competitive and relay races. The size of sponge-handball used at the survey was the one used by the age groups, since the size of the palm is also different at the different age groups. This way grip stability implemented with suitable sponge-handball was adequate to the certain age groups.

However, it is well-known that there is a significant difference between the throwing technics, coordination abilities, muscular power of arms and so on, of the first and fourth class pupil. Therefore the tasks had to be differentiated, so different shooting distances were chosen, that the distance between the target and the shooting place was different, accordingly to the different age groups which had been resultful in our previous surveys (pilot research). Since the different age groups threw from the same distance, the younger ones found it too difficult, while the older ones performed it almost without mistakes. The task accordingly the age was determined in the way that the distance of the vertical surface of the small box for 2. class pupils was 5.5 meters, while for 3-4. class pupils was 6 meters. Differentiation of the shooting distance was necessary because not only throwing technics got better with age, but throwing performance while aiming accuracy resulted in improving tendency, presumably thanks to taking part in the handball programme and also the above mentioned distances were set just like goal line for the different age groups. The students had two attempts. At each attempt they performed five shots so after some rest they had another five shots as second attempt.

Table 1. The results of Shooting in transversal straddle position without running up related to aiming accuracy, target accuracy, time results and technical implementation * significant $p < 0,05$ ** very significant $p < 0,01$ Lifted elbow (position of elbow: level of the shoulder or over of the shoulder)

	Boys				Girls			
	Autumn results		Spring results		Autumn results		Spring results	
	average	deviation	average	deviation	average	deviation	average	deviation
First attempt Score (pieces)	1,61	1,338	2,21	1,367	1,09*	1,007*	1,67*	1,204*
Second attempt Score (pieces)	1,71*	1,132*	2,26*	1,209*	1,13**	1,179**	1,64**	1,245**
First attempt Lifted elbow (pieces)	3,26**	1,951**	3,74**	1,747**	3,33**	1,894**	3,87**	1,447**
Second attempt Lifted elbow (pieces)	3,04**	2,099**	3,76**	1,651**	3,54*	1,745*	3,92*	1,432*
First attempt Time(sec)	11,55**	1,995**	10,59**	2,021**	11,58**	2,427**	10,97**	1,933**
Second attempt Time(sec)	11,04**	2,039**	10,06**	1,723**	11,23**	2,281**	10,52**	2,251**

In case of boys the average score from the first 5 throws was 1.61 (deviation=1.338) in the autumn survey. After the first five shots they had some rest and then threw five times again as the average value was 1.71 (deviation=1,132). The results of the second attempt, second aiming steadily showed better values. Muller (2004) had 10 relay kicks done by primary and secondary school students to test aiming accuracy. It is proven that the fourth kick attempt was the best, because of the above mentioned ones. The tenth attempt

resulted in the weakest result, as tiredness caused unfavourable tendencies in soft coordination.

In our research more precise aiming was shown by the fact that the deviation value measured at the second time proved to be smaller, the variation range of the output decreased showing more balanced aiming performance.

At the spring survey even efficiency of sponge-handball practices was seen. During the spring survey the boys performed this shooting task at 2.21 (deviation=1.367) value on average at the first attempt indicated better shooting accuracy after the first semester than in autumn. However, this improvement was merely tendentious since the shooting results of the two measurements did not show significant differences. Neither did the deviation values. During the second row of throwing attempts boys resulted in better values again, since the average of scores improved from 1.71 to 2.26 on average and deviation increased from 1.132 to 1.209 from autumn to spring. The cause of it may be that progression to output could increase variation range of scoring performance. When checking the second series, significant improvement was experienced at boys ($p<0,005$) since spring results got better than the autumn ones.

When checking the scoring accuracy of girls we found that during the autumn survey the score of the first aiming attempt was 1.09 (deviation=1.007) out of 5 throws on average, this value fell behind the more precise aiming results. The average of the second series was 1.13 (deviation=1.179), being more favourable than in the first series.

In the spring survey the scoring results at the girls were influenced by the efficiency of the sponge-handball activities, as well. During the spring survey the girls performed this aiming task at 1.67 (deviation=1.204) value on average since the first attempt showed better aiming accuracy after the first semester than in autumn. This improvement was not only tendentious, since significant differences were experienced between the two values ($p<0,005$), the performance of the girls concerning aiming accuracy got more improved by Handball at School programme. During the second row of throwing attempts girls again had better values, since the average of scores improved from 1.13 to 1.64 on average and deviation increased from 1.179 to 1.245 from autumn to spring. When checking the second series, significant improvement was experienced at girls ($p<0,001$) since spring results got provenly better than the autumn ones.

Besides scoring accuracy technical implementation, movement accuracy was also checked, the surveyor also watched at the certain throws how many times the attempt was performed with lifted elbow. The boys performed the throw with lifted elbow 3.26 times, with 1.951 deviation value, out of 5 attempts at the first autumn series. At the spring measurement the task was performed with proper technique 3.74 times on average, and with lower deviation value (1.742). More precise technical performance also improved. Compared to autumn results the improvement in technical implementation was proven by not only the smaller deviation but also significant differences were

experienced after doing the two sample-T probe. "Handball at School" programme had good effects also on improving technics. In the second series of the autumn survey boys performed the exercise with lifted elbow 3.04 times, with 2.099 deviation value. The spring results improved to 3.76 on average (deviation=1.651) which may be considered significant difference.

The girls performed the throw with lifted elbow 3.33 times, with 1.899 deviation value, out of 5 attempts at the first autumn series. At the spring measurement the task was performed with right technics 3.87 times on average, and with lower deviation value (1.447). The more precise technical performance also improved efficiency and target accuracy. Compared to autumn results the improvement in technical implementation was proven by not only the smaller deviation but also significant differences were experienced after doing the two sample-T probe. "Handball at School" programme had good effects also on improving the technics of the girls. In the second series of the autumn survey boys performed the exercise with lifted elbow 3.54 times, with 1.745 deviation value. This is a more favourable result than the values experienced at the first series. The spring results were improved at girls to 3.92 on average (deviation=1.432) which may be considered significant improvement.

It is interesting that girls generally performed more accurately, they had more punctual attempts, with smaller variation range as for technical implementation, the reason of which may be that boys are more confident in their shooting abilities, shooting power and girls offset it with more focus on technique.

Time spent on implementation was also measured, since motion pressed by time is also peculiarity of ball games, determining in open-skill sports. However, understanding sports-specific connection between fastness and accuracy is also important.

The boys performed the first series in 11.55 sec in autumn, which value decreased to 10.59 sec by spring. The average value of the second series in autumn was 11.04 which got improved to 10.06 sec by spring. The girls did the first series in 11.58 on average in autumn which was improved to 10.97 by spring. The second series resulted in 11.23 sec in autumn and in 10.52 sec in spring. The results of the boys were always better, they got faster in performing the exercise, and improvement was seen at both genders in time by spring.

Literature calls the attention to the connection of fastness and accuracy. Ambivalency of fastness-accuracy in kinetic skills was first mentioned in Fitts' Law. Schmidt (1996) examined correlation of fastness and accuracy on the example of baseball hit. In his research he stated that the increase of the speed of the swing or of the weight of the racket increased time and space accuracy.

The Hungarian training-theory expert dealing with this topic, Nadori (1989) wished to determine characteristics of fast and accurate motion. According to him efficiency of most

sports is determined by fast and precise implementation of movement that is 'action'. However, these two features – speed and accuracy – appear reversely in sports activities. It is generally true, that the faster one tries to perform the various kinetic actions, the less accurate technical implementation becomes, similarly the more accurate, precise movement one tries to perform, the slower the implementation becomes. Therefore Nadori (1989) thinks that an optimal 'zone' can be assumed in speed and accuracy where the sportsman is fast enough in his action not to decrease accuracy.

The next task was similar to the previous one, but the students had to implement the shooting task performed with running up characteristic in handball through a series of throws, with similarly different ball and shooting distance corresponding their age as mentioned in the previous trial.

Table 2. The results of shooting in transversal straddle position with running up related to aiming accuracy, target accuracy, time results and technical implementation * significant $p < 0,05$ ** very significant $p < 0,01$ Lifted elbow (position of elbow: level of the shoulder or over of the shoulder)

	Boys				Girls			
	Autumn results		Spring results		Autumn results		Spring results	
	average	deviation	average	deviation	average	deviation	average	deviation
First attempt Score (pieces)	1,50**	1,124**	2,09**	1,449**	1,02*	1,033*	1,76*	1,243*
Second attempt Score (pieces)	1,62*	1,219*	2,07*	1,289*	1,13*	0,944*	1,71*	1,299*
First attempt Lifted elbow (pieces)	3,04**	2,099**	3,64**	1,819**	3,21*	1,928*	3,89*	1,526*
Second attempt Lifted elbow (pieces)	3,26**	1,994**	3,73**	1,718**	3,300*	1,818*	3,81*	1,484*
First attempt Time(sec)	18,00*	2,597*	17,12*	2,607*	18,59**	3,389**	18,03**	3,131**
Second attempt Time(sec)	17,659*	2,494*	17,23*	2,735*	18,34**	3,036**	18,08**	3,154**

Similar results and tendencies can be seen to the previous trials when examining the results, shooting accuracy, technical implementation and time results of the boys and girls. It can be stated that in both the case of boys and girls shooting accuracy of the second series of throws are more favourable, and with smaller variation range. It is true for both boys and girls that target accuracy by scores in the autumn measurement got worse and the spring results got significantly better for both sexes. When checking technical implementation, girls performed the throws with right technique more often since lifted elbow was more frequent for them. Significantly better results were proven for both sexes in both score results, technical implementation and implementation time.

Conclusion

In our pilot research and survey we experienced that in junior school age tests measuring and checking conditional a coordinational abilities, sports specific tests of handball must be applied in holistic approach when wording talent and choosing a sport.

In our former article, these two pilot tests were studied among children where we compared the athletes' group done sports for 0., 1., 2. and 3. classes from autumn to spring. Handball at School programme demonstrated some development in the tested group after half year since the autumn and spring values of the two sample-T probes showed significant differences along certain variables (target accuracy, speed of implementation, technical implementation) (Juhasz at al., 2016).

In another article of us the fact was proven that by applying the same probes handball players achieved the best results and these students' targeted accuracy and constancy of performance who do not pursue any sports only at PE lessons were lower (Juhasz et al., 2017.).

Our research showed that in case of certain parametres (technical implementation, accuracy, shooting accuracy) Handball at School programme made different effect on students of different sexes, in case of girls the improvement is more dominant. Several trials showed that more development is experienced at girls at handball sports specific coordination tests.

Handball at School programme – meaning two sports specific lessons a week - improved shooting accuracy results, technical implementation and speed coordination of all students alike.

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