Ovidius University Annals, Series Physical Education and Sport / SCIENCE, MOVEMENT AND HEALTH
29 code CNCSIS category B+, Vol. 11, ISSUE 1, 2011, Romania
The journal is indexed in: 1. SPORTDiscus, Ebsco, INDEX COPERNICUS JOURNAL MASTER LIST. 2. DOAJ DIRECTORY OF OPEN ACCES JOURNALS

MOTOR COMPETENCES OF CHILDREN AT THE AGE OF SIX AS THE BASIS FOR MOTOR EDUCATION ACCOMPLISHMENT WITHIN INTEGRATED EDUCATION

CIEŚLA ELŻBIETA[1], MARKOWSKA MAŁGORZATA[2], ZAWADZKA BOŻENA[3],
[1] Faculty of Health Sciences, Jan Kochanowski University of Humanities and Sciences, Kielce, Poland,
[2] Faculty of Physiotherapy, Kielce, POLAND
[3] Prof. UJK, Department of Pedagogy and Art, Jan Kochanowski University of Humanities and Sciences, Kielce, POLAND
elaciesla@poczta.onet.pl

Abstract
Purpose. Movement abilities involve human possibilities of efficient, fast and accurate performance of motor activities. They are acquired during individual development as well as in the process of education and activities based on appropriate level of motor abilities and movement experiences. The skills condition precisely determined structure of movement and are visible in the course of a particular activity. Purpose of the research was to determine the level of basic movement skills mastered by children until they reach the age of six who begin and complete education in so called "0" classes preparing them for schooling within randomly selected kindergartens and primary schools in Poland.
Methods. The study material is based on the results of research conducted among children attending "0" classes (preparing them for school education) in randomly selected kindergartens and primary schools in Poland. As part of module assessing the level of physical fitness, 33,459 girls and boys (97,8% of all the children) were examined in the first stage of the research; in the second one – 34,355 children (97,2% of all the children examined). In the assessment of motor abilities the following skills were evaluated: one-hand/both-hands throw and grasp one-leg/both-legs jump, ball kicks, fast running, as well as general coordination while performing the exercises.
Results. There were significant differences between preschool children from cities and villages and from kindergartens and schools.
Conclusions. Lowering the school entry age ought to be connected with preparing suitable educational programmes including motor abilities development which satisfy natural needs for movement specific to this age group.
Key words. 6 year old children, motor abilities, school readiness.

Purpose

Every child who begins school education is equipped with a extensive set of skills which helps him/her to begin the school career (J. Budinková, P. Krušinová, P. Kuncová, 2006, p. 60). However, a high level of personal individuality as well as diverse experience from family environment, preschool education and peer relations largely determine successful existence in a new environment even in 6- or 7-year-old children.The relation between diverse developmental spheres is unquestionable and indisputable. It has won the reputation of a key importance problem in situations which are crucial to child's further development. One of these moments is when a child begins school education. It is relatively easy to define maturity or "school readiness" with reference to such basic skills as reading, writing, or a proper level of intellectual and emotional development, however, when it comes to defining the level of physical development, health and motor skills in terms of a child's readiness for becoming a pupil the interpretation is frequently troublesome (A. Kopik, M. Zatorska, 2009). The most popular view presented in the literature states that a child should be equipped with such a set of gross and fine motor skills as to allow for writing, painting and performing global movements with their proper and smooth coordination (W. Brejnak 2006, p.27, W. Osiński, 2003, p. 64).Currently, school education begins according to children's chronological age. In Poland children may start attending primary schools (elementary schools) at the age of seven. This age limit is going to be changed in 2011 and, similarly to the majority of European countries, six-year-old children will begin integrated education in the first form. Providing all pupils with a possibility to acquire key competences, whose adequately high level may in the future contribute to a successful life in a knowledge society became the very basis of education in a contemporary school (A. Kopik, M. Zatorska, 2009, p.21). Particular attention is given to proper physical and motor development expressed through creating suitable conditions for games and plays involving physical movement, providing encouragement to regular physical activity, overall developmental exercises and expanding motor skills. Motor activities largely contribute to the development of skills in all competences, as movement is a manifestation of every activity. Thus, the aim of the research is to determine the level of mastering basic motor activities in children who finish and begin a year-long preparation to school education in randomly chosen "0" classes and kindergartens in Poland. It is assumed to be the expression of their motor maturity, which is crucial in order to function properly at school.

Method

The study material comprised children born in 1999 and 2000 who finish or begin a year-long preparation to school education in different places of living in Poland. As a method, stratified random and

cluster sampling without replacement was used. Stratification was expressed with a province, type of institution, place of living (city, village – division on the basis of the structure, cities in urban-rural districts, rural areas in urban-rural districts). Sampling was conducted by PhD B. Walasek (A. Kopik, B. Walasek,. 2007, p. 12). Sampling frame was a set of institutions which accomplish a one-year preparation to school education. It was created on the basis of SIO-MEN system updated with a list of six-year-old children, which was provided by province education offices. The data base was complemented with GUS (Main Statistical Offices) codes provided by the Ministry for each province and district a given institution belongs to. For sampling, schools and kindergartens with groups with average more than 5 and fewer than 70 children were selected (ed. E. Cieśla, 2007, p.10). Altogether 66,129 children; 32,128 girls and 34,001 boys were examined. There were two stages of the research. The first one was conducted in April-May 2006. It comprised 33,459 children finishing their education in „0" classes. The second one comprised 32,670 children beginning a year-long preparation to school education. The date of the research procedure was dictated by the date of introduction of a project "A six-year-old child on the threshold of school education". The project was implemented as part of the European Social Fund and its accomplishment was intended to be in December 2006. Overall 18% of the population of six-year-olds was examined. There were 64 physical education teachers engaged in the assessment of the level of physical fitness, motor skills and lateralization. They were previously trained during special meetings in particular provinces. The aim of the research project was to assess selected motor skills such as: left/right-handed sack throw and grasp, both-handed ball throw and grasp from 4-5 meter distance, left/right-legged jump and both-legged jump at 5 meter distance, left/right-legged ball kick to the goal from 5 meter distance, and fast running at the distance of 10x5m. Additionally, the physical education teachers made an overall assessment of movement coordination during exercises. The prepared a 4-grade scale, based on the teachers' subjective assessment, took into account the guidelines from the instruction concerning sampling and its assessment. The scale involved qualitative description and allowed to determine the number of children who had difficulties in the proper performance of physical exercise elements which were important in school physical education. Sampling was determined by the assumed possibility of conducting the research in a variety of conditions offered by schools and kindergartens (E. Cieśla, 2007, p.85). The survey addressed to parents provided information on social and economic variables concerning the examined children's families. The overall material was verified and gathered into statistics. The data were grouped based on sex, place of living and the type of institution a given child attended to. The data were presented in tables and on pictures. Statistical significance was calculated with the chi-square test.

Results

The examined children were evaluated in their ability to throw a ball with both hands as well as throwing a sack at a target with one hand (right and left hand) pic.1-3. According to physical education teachers most six-year-olds performed the 'both-hands' throws well. About 50 % of children, in both the first and second stage of the investigation, were graded as 'good'. The second part of the investigation shows that the number of children performing throws very well is on the slight increase. Differences in grading were noted, especially in the frequency of giving the 'very good' grade, to girls' disadvantage. This phenomenon came to light in the first stage of the investigation (statistical evidence $p \leq 0.001$). Only 1 % of children, both in the first and the second stage of the investigation, could not do this trick.Similarly to the 'both-hands' throw, over 47% of the investigated threw the sack with the right hand well. Only 1.5% in the first and 2.4% of six-year-olds in the second part of the investigation had visible problems with the right-handed throw at a target. It should be noted that boys more often than girls were given the 'very good' grade (pic.2). Differences between sexes were statistically evident in both parts of the investigation on the level $p \geq 0.001$. A 'left-handed' sack throw was evaluated in a slightly different way. Children were given 'good' and 'average' grades much more often. The percentage of children who couldn't perform the 'left-handed' throw was different in both parts of the investigation. According to physical education teachers the children who began a year-long preparation for school education (stage II) got the lowest grade 'can't perform' (4%) much more often than their friends who were examined at the end of the year-long stage of preparation for school (stage I – 2.5%). A higher percentage of those who had problems with doing this trick came to light among the group of boys. The differences between boys and girls in grading the quality of the 'left-handed' throw were statistically evident in both parts of the investigation (pic.3).

The investigative program was also supposed to evaluate the quality of performing 'one-handed' and 'both-handed' grasps (pic.4-6). The percentage variation in this respect was similar to that in the case of 'throws'. A significant majority of the investigated was given good grades by teachers. The percentage of children who could not grasp the ball with both hands is insignificant, it is significantly lower in the case of six-year-olds examined in the first stage. It should also be noted that boys more often than girls got extreme grades (performing very well and not able to perform). Whereas girls get good and average grades for performing this trick more often (pic.4). In the case of 'right-handed grasps' there are more children who have problems with this trick. In the second part of the investigation the percentage of children in this category was similar (girls and boys), in the first stage it was

smaller by 3 percentage points. The statistical evidence as the manifestation of grade differences between boys and girls $p \geq 0.001$ was observed only in the first part of the investigation (pic.5). Analysing the 'left-handed' sack grasps a higher percentage of 'average' and 'not able to perform' grades than in the case of 'right-handed' grasps can be observed. This is evident in both parts of the investigation. It was boys who got very good and good grades more often than girls (pic.6).

The results of the investigation of 'both-legged' and 'one-legged' jumps were shown in pic.7-9. About 50% of children did those jumps well. Differences in evaluation between children beginning (2 stage) and finishing a 'year-long' preparation for school were observed. Those children who were completing class'0' got higher grades more often. The percentage of six-year-olds who did not master the skill of jumping on the 'average; level is 4.3% for left-legged jumps in the second stage of the investigation (the result refers all those who were investigated (5.3%in the group of boys and 3.2% in the group of girls), for right-legged jumps – 2.4% for all those who were examined (3.2% for boys and 1.6% for girls) and for both-legged jumps – 3.2% - all those who were examined (4.3% - boys and 2.1% - girls). It should also be noted that in the group of boys in comparison to the group of girls the grades 'very well' and 'not able to perform' were given much more often.While considering the results of 'right-legged' and 'left-legged' kicks it was discovered that, similarly to most exercises evaluating movement skills of children realizing a year-long preparation for school, most children were able to perform 'left-legged' and 'right-legged' kicks. In the case of 'right-legged' kicks the results show that they were performed very well. 'Left-legged' kicks got lower grades (good and average), even in the groups of boys. Pic.10-11. The percentage of children (boys and girls) who could not perform kicks was low, 0.6% - 1.8%. As was expected it was higher among girls than boys. Also there were more good results in the first stage of the investigation, girls and boys, meaning those children who were completing kindergarten education on the level of "0" class. While running the distance of 10×5 m, besides timing it, physical education teachers were grading its correctness (pic.12). The analysis of the data shown in the picture proves that six-year-olds run technically good and very well. Children who were completing the year-long preparation for school got the highest grades (81% of six-year-olds got grades like that). On the average 0.6% of the examined could not run properly. A difference between sexes was noted while grading. Boys more often than girls were doing it very well. Girls got 'good' or 'average' grades most often (sex differences were on the level $p \geq 0.001$.The tests that were done allowed a general evaluation of children's coordination of movement in the process of doing the exercises (pic.13). The examined six-year-olds got very high grades. Over 70% of all examined in every stage of the investigation got very good and good grades. The percentage of children who got 'below the average' grades was very low (about 0.3%). Big differences in grades between the groups of boys and girls were discovered. Especially in the case of high grades. In the first stage it was boys and in the second stage it was girls who got a high level of coordination. Boys more often than girls had problems with coordination while doing the exercises. In each stage of the investigation this difference was statistically proved ($p \geq 0.001$).

Discussion and conclusion

The findings of the study allowed to assess basic motor abilities of children who start (the 2nd stage) and finish (the 1st stage) a year-long preparation for learning at school. Six-year-old children are characterized by a high level of motor abilities. This is proved not only by the high marks given by physical education teachers in individual motor trials but also by the complex assessment of physical coordination of a child while doing exercises. It is necessary to stress that abilities based on whole-body movements such as running were not difficult for children while practising them. Throwing a ball with both hands, throwing a bag with one hand as well as kicking a ball at a selected goal were also easy motor activities. However, catching a ball or a sack, especially with one hand, was definitely more difficult for children. It should be stressed that in the study group of six-year-old children there were differences in the quality of the performed motor tasks. The girls were more often assessed in the categories: they performed "moderately" and "good", but the boys in the categories: "well" and "very well". As for one-legged and both-legged jumps, it was also stated that the girls of the study group performed better than the boys. Nevertheless, the physical education teachers assessed higher other abilities, especially those concerning kicking with a right foot in the study group of the boys. The noticed differences between the sexes confirm the previous studies on motor efficiency of children at the nursery school age. B. Sekita (1985, p.12-23) observed significant differences in results of the basic efficiency trials connected with a run, a long jump and a throw. There are also other studies which are the basis for such a statement (R. Przewęda, J. Dobosz, 2003, p. 35-46). The conducted large-scale research with the specified two stages, thanks to which it was possible to observe abilities of a child completing and starting their education in so called "a reception class", gave an opportunity to notice some progressive changes concerning not only the quantity but also the quality of the produced movements (J.E. Rink, 2004). This results in the fact that a bit lower categories of marks are given for performing tasks by the younger children (the 2nd stage) in comparison with the older ones (the 1st stage). The stage of mastering these activities is spread out over the time and distinctly individualized (Kelso, Clark, 1982, quoted after R. Malina, 1991). A child at the nursery school age is characterized by a high level of readiness to take up various challenges. It is also the period of

time which is particularly intensive for developing basic motor abilities (R. Przewęda, 1985, p. 101). Because of a child's natural curiosity about getting to know the surroundings, a passion for games and plays involving physical movement, and limitation of fear of new abilities as well as joy derived from movement, a child easily masters new sequences of the movement and also arranges them into motor complexes of a different level of difficulty. The wealth of the mastered motor activities determines a necessary condition for undertaking actions aimed at learning to write and draw. The vast store of motor activities enables children to participate in an optimal way in the future lessons as well as sports and recreational classes. It also gives an opportunity to maintain a good relationship with their peers. Their lowered potential may be a signal of developmental disorders, various dysfunctions.The findings of the studies suggest formulating the following observations:

1. Children performed at good and very good level of movement abilities. Those completing preschool education were assessed significantly higher.
2. Children more properly mastered the exercises based on whole-body movements (e.g. running) and right-hand/leg movements. However, they had problems with opposite-limb movements and complex coordination activities (e.g. one-hand grasp).
3. Lowering the school entry age ought to be connected with preparing suitable educational programmes including motor abilities development which satisfy natural need for movement specific to this age group.

The research was conducted as part of the project "Six-year-old child on the threshold of school education" – the project financed by Ministry of National Education (No 5/2.1a/2004/2939) and co-financed by the European Union within the European Social Fund.

References

BREJNAK, W., 2006. *Czy twój przedszkolak dojrzał do nauki?*PZWL, Warszawa, p.27.

BUDINKOVÁ J., KRUŠINOVÁ, P., KUNCOVÁ, P., 2006. *Czy twoje dziecko jest przygotowane na spotkanie ze szkołą?* Helion, Gliwice, p. 60.

CIEŚLA, E., 2007. *Sprawność fizyczna,* in: A. Kopik [ed.] *Sześciolatki w Polsce. Diagnoza badanych sfer rozwoju,* Apla, Kielce, p. 85-134.

KOPIK, A., WALASEK, B., 2007. *Cele i koncepcja badań,* [in:], Kopikik, A., [ed.], *Sześciolatki w Polsce. Diagnoza wybranych sfer rozwoju,* Apla, Kielce, p.12-17.

KOPIK, A., ZATORSKA M., 2009. *Każde dziecko jest zdolne,* Apla, Kielce, p.21.

OSIŃSKI, W., 2003. *Antropomotoryka,* AWF, Poznań, p. 51-65.

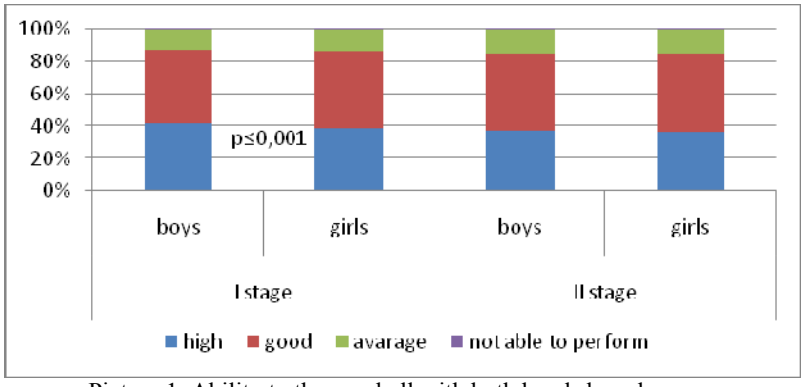
MALINA, R, M., BOUCHARD C., 1991. *Growth, Maturation, and Physical Activity.* Human Kinetics Books, Illinois, p. 70-98.

PRZEWĘDA, R., 1982. *Rozwój ruchowy,* [in:] Jaczewski, A., Woynarowska B., [ed.], *Dojrzewanie,* WSIP, Warszawa, p. 99-130.

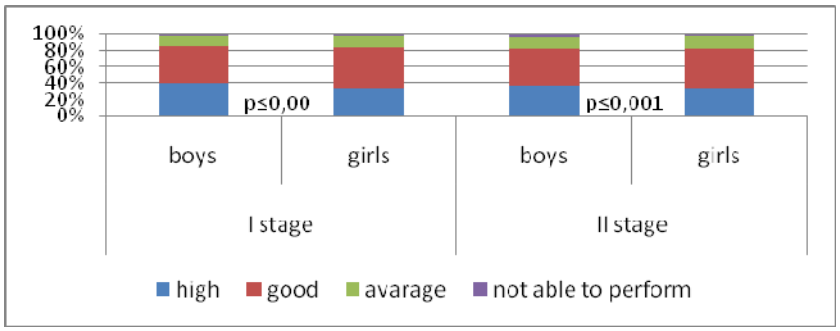
PRZEWĘDA, R., DOBOSZ J., 2003. *Kondycja biologiczna polskiej młodzieży,* AWF, Warszawa, p. 3-66].

RINK, J. E., 2004. *It's Okay to Be a Beginner: Teach a Motor Skill, and the Skill May Be Learned. Teach How to Learn a Motor Skill, and Many Skills Can Be Learned—Even After a Student Leaves School*." The Journal of Physical Education, Recreation and Dance, 75, p. 31–34**.**

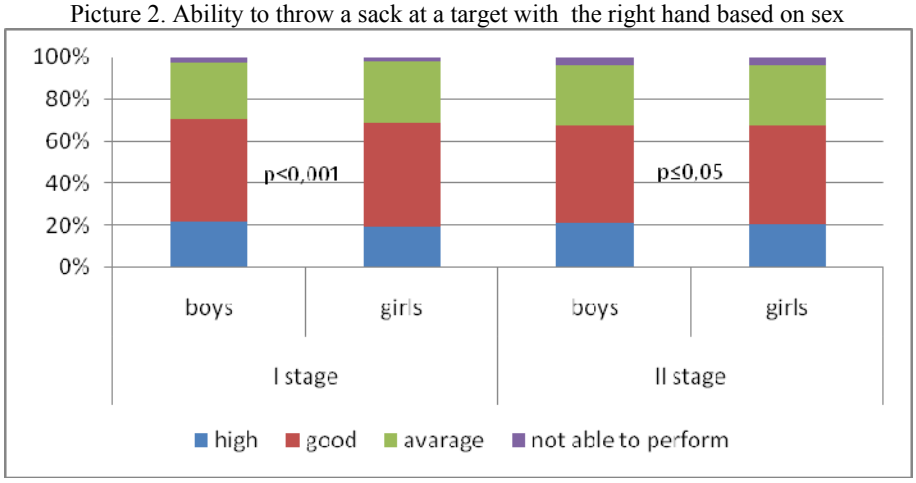
SEKITA, B., 1988. *Rozwój somatyczny i sprawność fizyczna dzieci w wieku 3-7 lat,* [in:] Pilicz, S., [ed.], *Rozwój sprawności i wydolności fizycznej dzieci i młodzieży,* AWF, Warszawa, p. 12-35.



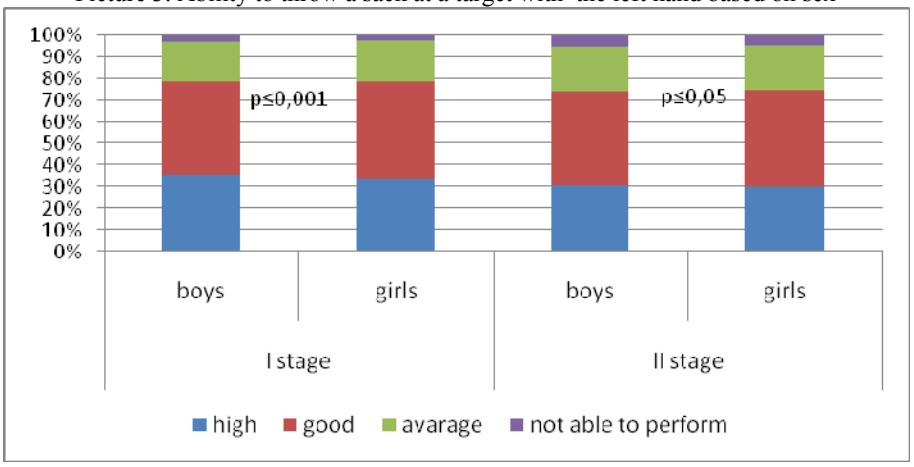
Picture 1. Ability to throw a ball with both hands based on sex



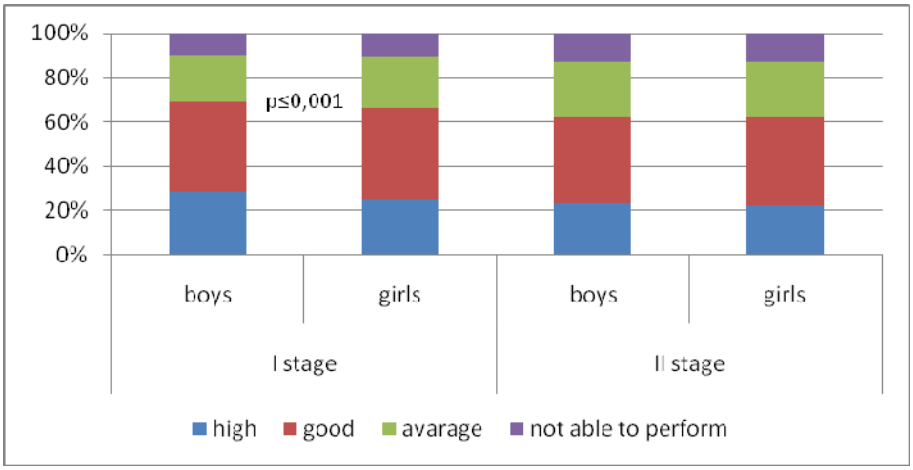
Picture 2. Ability to throw a sack at a target with the right hand based on sex



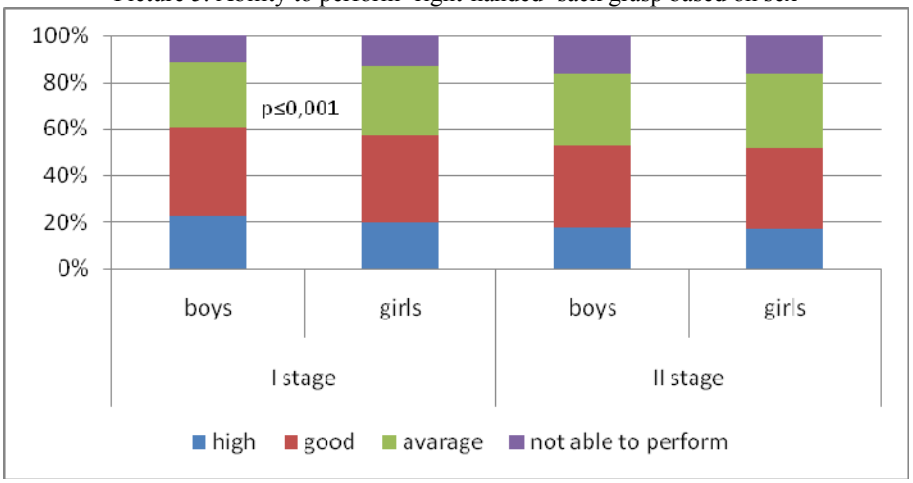
Picture 3. Ability to throw a sack at a target with the left hand based on sex



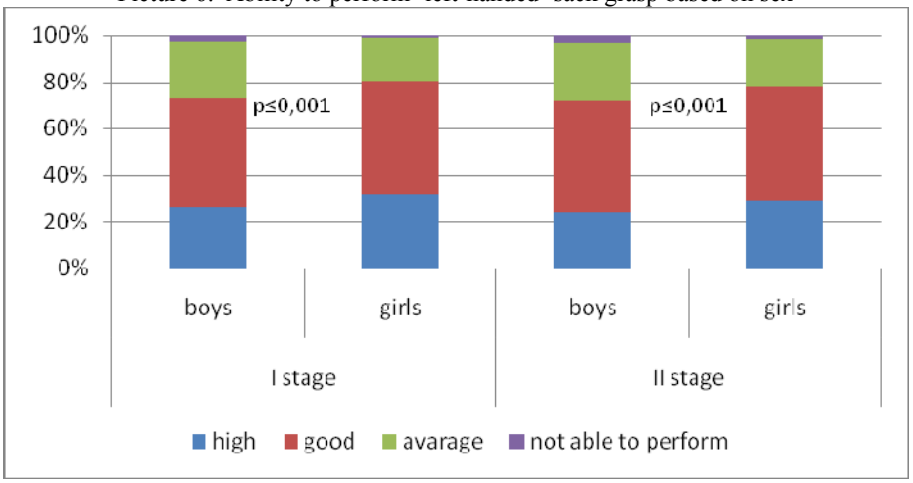
Picture 4. Ability to perform 'both-handed' grasp based on sex



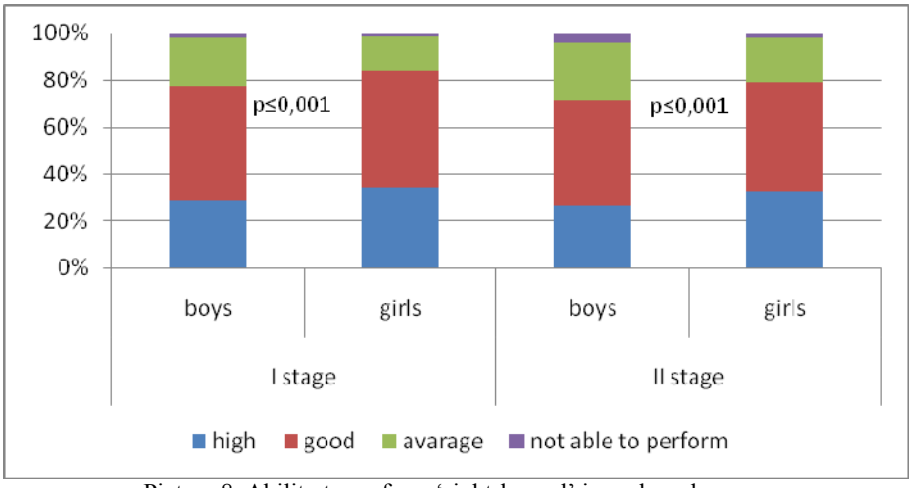
Picture 5. Ability to perform 'right-handed' sack grasp based on sex



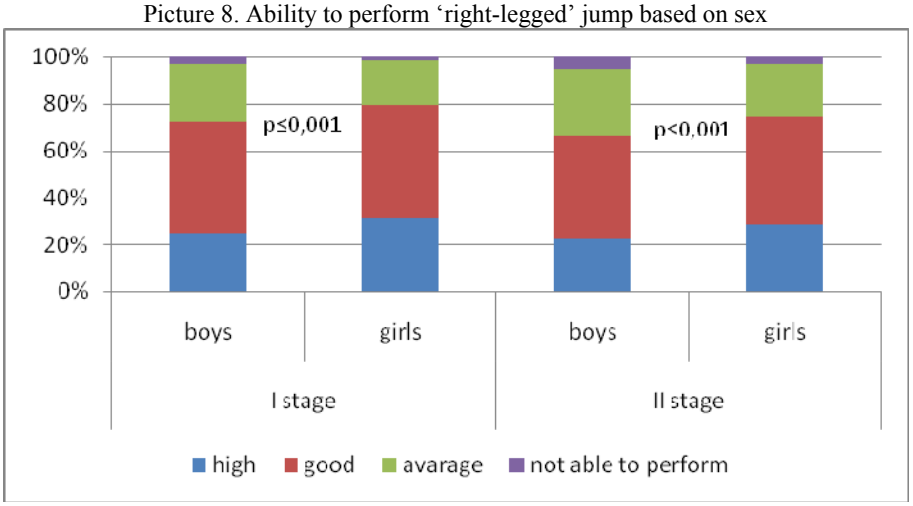
Picture 6. Ability to perform 'left-handed' sack grasp based on sex



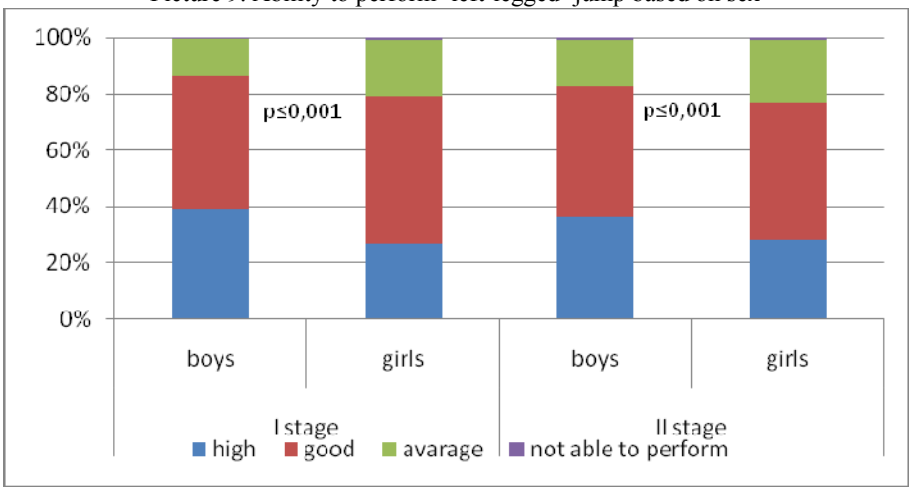
Picture 7. Ability to perform 'both-legged' jump based on sex



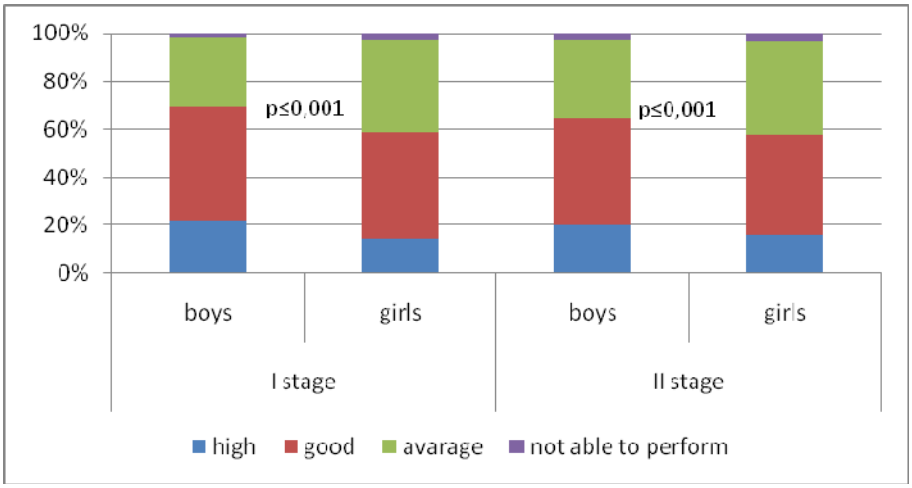
Picture 8. Ability to perform 'right-legged' jump based on sex



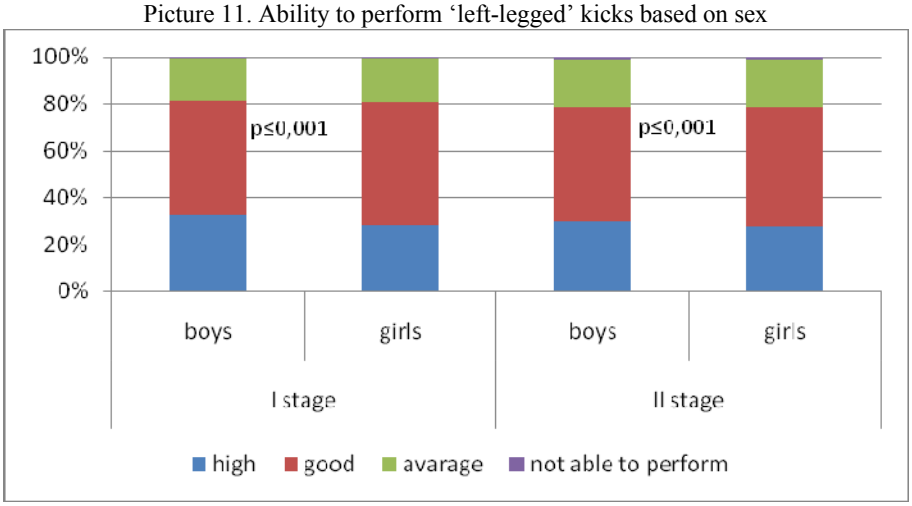
Picture 9. Ability to perform 'left-legged' jump based on sex



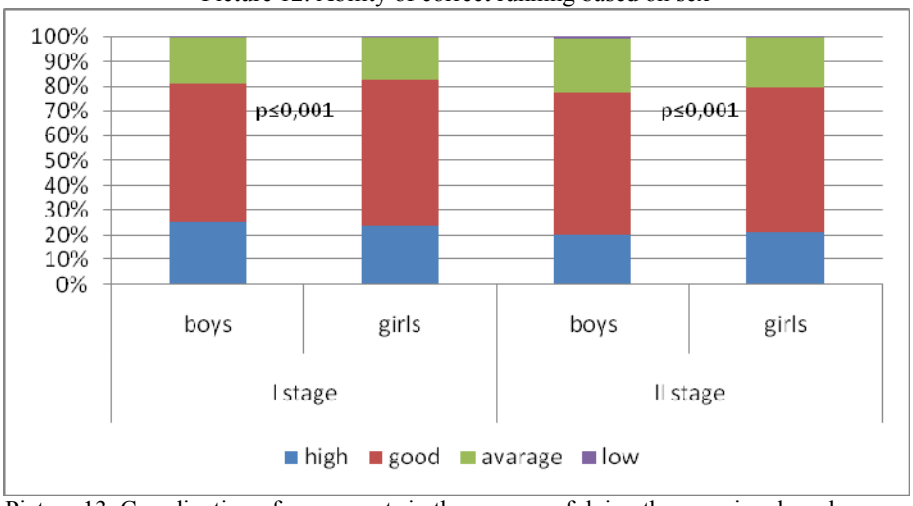
Picture 10. Ability to perform 'right-legged' kicks based on sex



Picture 11. Ability to perform 'left-legged' kicks based on sex



Picture 12. Ability of correct running based on sex



Picture 13. Coordination of movements in the process of doing the exercises based on sex