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The Effect of Manipulative, Movement and Preparatory Sports Games on Correction of Behavior Disorders in Integrated Elementary School Pupils with ADHD

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Abstract

Hyperactivity associated with lack of concentration poses a problem to teachers. This behavioral disorder, which affects school achievement, behavior and social relationships, requires specific educational approach. One of the possibilities of correcting such a disorder is through movement and physical activity, which is important not only for somatic development, but also for social development of children. At present, this issue is being discussed among experts in the field. The research was conducted in the school year 2012/2013. The sample consisted of 46 primary school teachers who taught at the first degree of elementary school. The teachers evaluated 123 integrated pupils aged 6 to 10. To assess behavioral disorders, we used Vanderbilt ADHD Diagnostic Teacher Rating Scale (VADTRS), a diagnostic tool used by teachers to identify children with ADHD. Arousing interest in physical activities, increasing their effectiveness and making these activities more esthetic had positive effect on children as shown by their interest in physical activities. The teachers confirmed *improvement in relationships with peers* (89.13%), *following directions/rules* (93.48%) and *disrupting classes* (86.96%). This study was supported by project VEGA 1/0769/13 "The Effectiveness of Specific Movement Reeducation Procedures on the Correction of Hyperkinetic Disorders of Prepubertal Children".

Keywords: primary symptoms of ADHD, children with behavior disorders, ISCED 1, hyperactivity, Vanderbilt ADHD Diagnostic Teacher Rating Scale.

Introduction

Hyperactivity associated with lack of concentration poses a problem to teachers. This behavior disorder has an undesirable effect on children's behav-

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ior, which is viewed to be problematic. These signs increase the risk of teachers forming negative attitudes towards such children due to their disrupting and unpleasant behavior [6]. Therefore, hyperactive children tend to be subject to more criticism. This has negative effect on their self-assessment by increasing the risk of negative self-perception as an unacceptable, incapable and unsuccessful person. Behavior that serves as a defensive mechanism in a situation a child is unable to cope with in another way is often problematic and, from the viewpoint of others, inadequate, which may cause trouble. Hyperactive children tend to be anxious, suffer from self-talk, emit various sounds and often run around. They have trouble being at ease and being relaxed [10].

Motor responses of children diagnosed with ADHD are inadequate in their number, intensity and speed relative to stimulus. These children are evidently clumsy when engaging in visual and spatial cognitive tasks requiring fine motor skills. The decreased level of fine motor skills is to a large extent accompanied by inhibited gross motor functions. Body movements are often inaccurate, disorganized and irrelevant in relation to task or overall situation. As reported by several authors [1], [5], manifestations of hyperactivity are often visible.

This behavior disorder, which affects school achievement, behavior and social relationships, requires specific educational approach. ADHD syndrome can be treated. Borová et al. [3] reported that physical activities had positive effect on behavior of children diagnosed with ADHD (hyperactive children), behavior disorders due to the fact that such activities increase self-control and decrease impulsiveness, which leads to improved state of health.

Movement and physical activity are beneficial not only for somatic development of children, but also for their social development [6]. Movement may assist in coping with hyperkinetic disorder. The most appropriate type of movement for prepubertal children is playing games. Games help to develop mental maturity of children through obtaining new knowledge. Through play, children learn to direct their emotions and learn to be independent of their surroundings [12], [13]. Children also learn to establish contact with people at school by respecting teacher's authority and instructions. In addition to that, through playing games children form friendly and work relationships, learn to be part of a team, to behave honestly by exerting great volitional effort with a great deal of fantasy and ideas. They also learn to obey rules and acquire a variety of motor stereotypes they may use later in their life [19]. Manipulative, movement and preparatory sports games are an adequate emotional tool. Therefore, we assume that manipulative, movement and preparatory sports games can be an adequate tool for coping with difficulties associated with hyperkinetic disorder of integrated children within the educational process [17], [21].

Such knowledge has become challenging for specialists and educators who seek ways to increase the quality and outcomes of the educational process. The thematic unit "Manipulative, movement and preparatory sports games" allows

creative teaching. Creative teachers engage children in educational activities by proportionately implementing all types of movement games (jumping, chasing and hitting-a-target games, etc.) and also games designed to develop motor abilities of children. During the games that teachers apply, children use various sports and nontraditional equipment or ways of manipulating such equipment, by applying them in easy manipulative games. With integrated children, teachers make use of the effect of manipulative, movement and preparatory sports games on children's motor skills and correction of behavior disorders. These games are incorporated into the organizational structure of daily schedule in accordance with the National Education Program ISCED 1.

Manipulative, movement and preparatory sports games can increase self-control and decrease impulsiveness of integrated pupils with ADHD in the school setting. It may be assumed that according to reported evidence, this has become an issue, which has to be addressed in the school environment. A teacher is positive about having a group of good pupils in class. Therefore, teachers integrate less skilled children into regular student groups by quietly emphasizing strengths of the most gifted children in order to point to their exemplary behavior in all aspects of play [15], [16].

Material and methods

The purpose of the study was to determine the effect of manipulative, movement and preparatory sports games on the correction of behavior of integrated pupils diagnosed with ADHD in the school setting.

Hypothesis: We hypothesized that the effect of manipulative, movement and preparatory sports games, which attracted attention of pupils with behavior disorders, would lead to correction of behavior of integrated pupils with ADHD and that improved behavior would be confirmed by teachers in 3 subscales: *relationships with peers, following directions/rules* and *disrupting class*.

This study was supported by project VEGA 1/0769/13 "The Effectiveness of Specific Movement Reeducation Procedures on the Correction of Hyperkinetic Disorders of Prepubertal Children". The research was conducted in the school year 2012/2013. The sample consisted of 46 primary school teachers who taught at the first degree of elementary school. The teachers evaluated 123 randomly selected integrated pupils aged 6 to 10. Of these, 52 were girls (mean age 7.5 years) and 71 boys (mean age 6.8 years). Participation in the study was voluntary and anonymous. The questionnaire response rate was 100%. Data were collected under own supervision at particular schools after obtaining consent from school principals and teachers of particular subjects at each of the schools.

Description of methods

Vanderbilt ADHD Diagnostic Teacher Rating Scale (VADTRS) is a diagnostic tool used by teachers to identify children with ADHD [21]. The advantage of the scale is that it is easy to understand and to administer and can be clearly scored.

Psychometric properties of the scale used abroad are very good, the scale reliability ranges from $\alpha = 0.79$ for depression and anxiety to $\alpha = 0.91$ for symptoms [21].

To process collected data we compared relative frequencies between boys and girls to determine their interest in manipulative, movement and preparatory sports games.

Table 1. Vanderbilt ADHD Diagnostic Teacher Rating Scale “Classroom behavior”

Classroom behavior	Excellent	Above average	Average	Satisfactory	Unsatisfactory
Relationships with peers	1	2	3	4	5
Following directions	1	2	3	4	5
Distrupting class	1	2	3	4	5
Assignment completion	1	2	3	4	5
Organizational skills	1	2	3	4	5

Source: Wolraich et al. [21].

Specific educational procedures and work organization: modification of environment, placement of the student in the class, individual work pace and learning styles of pupils, instruction methods and approaches to educating pupils, assessment of behavior and study achievements.

In the thematic unit “Manipulative, movement and preparatory sports games (both traditional and nontraditional games)”, we wanted the children to develop practically all game skills, acquire correct technique of equipment manipulation and correct technique of game skills used in games during classes. The purpose was to teach children to use these game skill in various environments.

We focused on interconnecting theoretical knowledge and practice. The pupils memorized the names of games used during classes, applied and followed the game rules. The pupils also had knowledge about and could name game skills used when playing manipulative, movement and preparatory sports games. We also provided pupils with basic information on games and competitions, the relevance of competitiveness in sports and correct technique of particular game skills. The pupils acquired knowledge about both correct manipulation with exercise equipment and basic rules of applied games. We placed emphasis on the principles of acceptable behavior at sports events as well as on safety and hygiene-related principles during playing games.

Educational activities were proportionately incorporated into all types of movement games (jumping games, chasing games, hitting-a-target games, etc.) and also games designed to develop all motor abilities. During games, children used various types of both traditional and nontraditional equipment and applied ways of their manipulation when playing easy manipulative games. The movement games and exercises were used to refine motor skills and correct behavior disorders of integrated children.

Results and discussion

Boys and girls refined their games skills and learnt the names of games during classes. The children followed and respected established rules and developed their technique of equipment manipulation. The correct technique of game skills was refined through games played during classes. The respondents used acquired skills in various settings.

Teachers accepted the interest of integrated pupils in manipulative, movement and preparatory games and exercises (see Table 2 and 3). Teachers used Vanderbilt ADHD Diagnostic Teacher Rating Scale to identify children with ADHD. It is reported that exercise has positive emotional effect for boys and girls of all ages. The application of manipulative, movement and preparatory sports games and exercises improved “**classroom behavior**” for relationships with peers, following directions/rules and disrupting class.

The physical activities that children engaged in within the thematic unit “Manipulative, movement and preparatory sports games” (Traditional and non-traditional games) and which aroused interest of prepubertal children are presented in Tables 2 and 3. Data are classified according to the interest of children.

Mazal [14] and Majherová [13] state that the main characteristics of movement games are their attractiveness, spontaneity, active rest, development of motor abilities and motor skills, social empathy, morale, willpower and self-control. A positive finding was that both movement and sports games whose content makes them popular with children were popular with 100% boys. They are collective by promoting interpersonal relationships and by enabling children to apply their creativity. The role of educators is to support children’s joy of movement and their desire to exercise. If children like exercise and get immersed in exercise, then exercise becomes a permanent part of their lives. Among factors that may have positive effect on physical education process, provide exercise stimuli, increase interest, effectiveness and esthetic character are various non-traditional games as well as nontraditional exercise equipment [9]. A positive finding is that games with nontraditional equipment were popular with 76.38% boys. It definitely is an adequate form of attracting attention and increasing activity of boys. The relevance of competitiveness in sports and conduct at sports events

was accepted by 43.05% children. In total, 40.27% children followed safety and hygiene guidelines when playing games. The rules of game selection were used by 13.88% boys, which was lowest of all (see Table 2).

Table 2. Interest in manipulative, movement and preparatory sports games: Boys

Games	Boys	
	n	%
Movement games	71	100.00
Sports games	71	100.00
Games with nontraditional equipment	55	76.38
Manipulative games	50	69.44
Basic game skills	46	63.88
Relevance of competitiveness in sports	31	43.05
Conduct at sports events	31	43.05
Safety and hygiene during games	29	40.27
Game skills	26	36.11
Games in different settings	10	13.88
Rules of game selection	10	13.88

Note: n – sample size, % – percentage

Table 3. Interest in manipulative, movement and preparatory sports games: Girls

Games	Girls	
	n	%
Movement games	52	100
Sports games	50	96.15
Games with nontraditional equipment	51	98.08
Manipulative games	51	98.08
Basic game skills	43	82.69
Relevance of competitiveness in sports	38	73.08
Conduct at sports events	38	73.08
Safety and hygiene during games	52	100
Game skills	28	53.85
Games in different settings	26	50
Rules of game selection	26	50

Note: n – sample size, % – percentage

It may be assumed that consistent use of manipulative, movement and preparatory sports games, performing basic game skills in varying conditions, dif-

ferent ways of manipulating equipment when playing games in various settings and situations and the rules of selected games had positive effect on children's both physical and mental capacity.

All girls showed interest in playing movement games. Majority of girls were also interested in playing sports and manipulative games and games with nontraditional equipment. It should be noted that safety and hygiene during playing games were considered most important. Children were interested in basic game skills, relevance of competitiveness in sport and conduct at sports events. Similarly to boys, girls reported that they liked and were interested in performing these activities. The lowest percentage was found for popularity of game skills, games played in various settings and the rules of game selection (see Table 3).

Both girls and boys positively perceived the incorporation of manipulative, movement and preparatory sports games into the organizational structure of educational process. The comparison of genders showed dominance of girls. Almost identical percentages of girls and boys preferred movement games, sports games and game skills. In all the remaining domains, preferences were statistically different for girls (see Table 4).

Table 4. Statistical significance for difference in preferences between genders

	signif.
Movement games	0
Sports games	1.66
Games with nontraditional equipment	3.27**
Manipulative games	3.95**
Basic game skills	2.19*
Relevance of competitiveness in sports	3.24**
Conduct at sports events	3.24**
Safety and hygiene during games	6.83**
Game skills	1.9
Games in different settings	4.32**
Rules of game selection	4.32**

In education practice, implementation of games is important as games in general are highly emotional, promote team spirit, increase self-control and facilitate emotional satisfaction. In the sample studied, the implementation of games was supposed to decrease tension and aggressiveness, improve interpersonal relationships and physical and mental capacity. What we aimed for was to educate, bring up and create a community without either knowing or realizing it.

The third part of the Vanderbilt ADHD rating scale evaluates social behavior of children in school classes in five domains: *relationships with peers, following directions/rules, disrupting class, assignment completion* and *organizational*

skills. With regard to “classroom behavior”, we assessed relationships with peers, following directions/rules and disrupting class. The data related to these 3 questions are presented in Figures 1 to 3.

Do you think that manipulative, movement and preparatory sports games have positive effect on relationships with peers? (Figure 1)

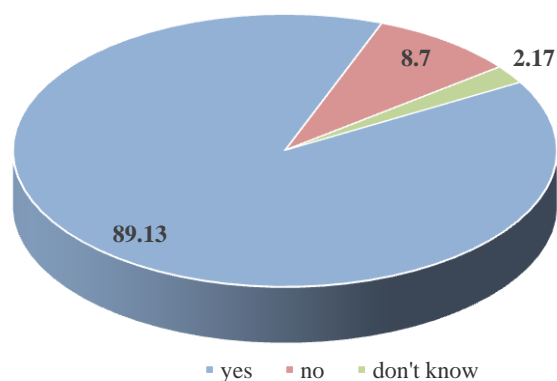


Figure 1. Relationships with peers (percentage)

In total, 89.13% teachers confirmed that manipulative, movement and preparatory sports games were appropriate physical activities the incorporation of which improved relationships with peers. As reported by Blahutková, Klenková, Zichová [2], integrated pupils with behavior disorders need to be treated with care. Teachers should not shout at children, but should assign children tasks that are easy to handle, show interest in children by using gentle touch and find an activity a child is good at and follow the principle – less and often is better.

Do you think that manipulative, movement and preparatory sports games have effect on following teacher’s directions and rules? (Figure 2)

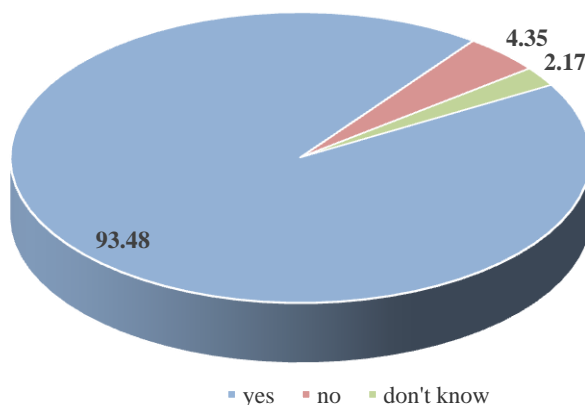


Figure 2. Following directions and rules (percentage)

The teachers accepted the evidence reported by Riefová [18] who believed in “uniform approach to children, mutual respect, helpfulness, mutual trust and support.” This led to improved interaction between teachers and their pupils. Pupils showed natural respect for teachers. This finding was reported by 93.48% teachers.

Do you think that disrupting class by integrated children with ADHD decreased through manipulative, movement and preparatory sports games? (Figure 3)

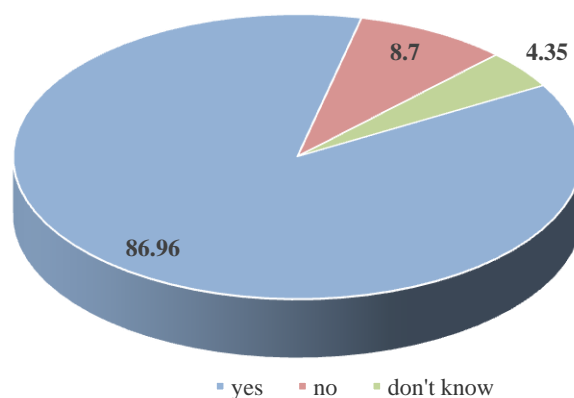


Figure 3. Disrupting class (percentage)

During school attendance, pupils should acquire social skills, learn to coexist with other people, to control their emotions, to perform in front of class, to conform to group goals, to accept full consequences of their actions within class, to cope with the group opinions about their own behavior, to experience the feeling of group cohesiveness and to learn to accept the assessment of their performances, etc. [20], [22]. The incorporation of manipulative, movement and preparatory sports games led to decline in disrupting class by integrated pupils diagnosed with ADHD. This decline was confirmed by 86.96% teachers, who noted that taking care of children with ADHD was demanding.

Conclusions

We have provided further evidence about the benefits of manipulative, movement and preparatory sports games for integrated children with behavior and hyperactivity disorders. It may be concluded that educational stimuli for children were provided and created. Arousing interest in physical activities, increasing their effectiveness and making these activities more esthetic had positive effect on children by correcting their behavior disorders as *classroom behavior* and *relationships with peers* improved. Integrated children with ADHD

started to *follow teacher's direction and rules* and *disrupting class* declined. Our hypothesis has been confirmed. We pointed to the benefits of movement for children and to the effect of movement on their mental and physical health. This shows that physical activity is irreplaceable throughout life. The study findings have shown that movement and creative and esthetic physical activities have positive effect on children with hyperkinetic disorder.

Recommendations for practice

We studied a serious issue of behavior and hyperactivity disorder. Therefore, educators should be able to integrate such children with behavior disorders into groups of pupils and make such children form a positive emotional attitude towards other children. Teachers should also know their needs and rates of interest in physical activities and use them to the favor of children.

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Streszczenie

Wpływ manipulacyjnych, ruchowych i przygotowawczych gier sportowych na poprawę zachowania uczniów integracyjnej szkoły podstawowej cierpiących na ADHD

Nadpobudliwość, związana z ciągłym rozpraszaniem uwagi, jest główną przeszkodą w pracy szkolnej. Zaburzenie zachowania, które wpływa na wyniki w nauce, zachowanie oraz relacje społeczne ucznia, wymaga szczególnego podejścia w edukacji. Jedną z metod poprawiania zachowania jest ruch i aktywność fizyczna. Ruch jest ważny nie tylko dla prawidłowego rozwoju fizycznego, lecz także dla rozwoju społecznego dziecka. Obecnie stanowi to znany problem.

Badania przeprowadzono w roku szkolnym 2012/2013. Grupa nauczycieli pierwszej klasy szkoły podstawowej w Preszowie składała się z 46 ankietowanych, którzy oceniali 123 integrowa-

nych uczniów szkół podstawowych. Zastosowaliśmy skalę Vanderbilt ADHD Diagnostic Teacher Rating Scale, VADTRS – narzędzie przeznaczone dla nauczycieli do orientacyjnej oceny dzieci z podejrzeniem ADHD.

Poprzez zwiększenie atrakcyjności, efektywności i estetyki aktywności ruchowej udało się nam pozytywnie wpłynąć na dzieci oraz ich akceptację takiej formy zajęć. Uzyskaliśmy korektę zaburzeń zachowania. Nauczyciele potwierdzili poprawę w *stosunkach między rówieśnikami* (89,13%), *szacunku dla nauczycieli* (93,48%) i *rozpraszaniu uwagi w klasie* (86,96%).

Kwestie te poruszane są w ramach programu grantowego VEGA nr 1/0769/13 „Skuteczność specyficznych reedukacyjnych metod ruchowych w poprawie zaburzeń nadpobudliwości u dzieci w młodszym wieku szkolnym”.

Słowa kluczowe: podstawowe objawy ADHD, dzieci z zaburzeniami zachowania, ISCED 1, nadpobudliwość, skala Vanderbilta – skala oceny ADHD dla nauczycieli.