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Judo as a supplementary form of therapy for children with mental retardation

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B Data Collection
C Statistical Analysis
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Abstract

Background & Study Aim: Children suffering from mental retardation tend to spend most of their time at home or in hospital. Therapists should, therefore, seek ways for them to contact the outside world (animals, peers). Similarly to their healthy peers, handicapped children should have the possibility of fulfilling their hobbies. Apart from rehabilitating, non-standard forms of therapy help shape the child's interests, develop the child's passions. Hence, the primary cognitive goal of the research was the effectiveness of judo sessions as a supplementary therapeutic method dedicated to children with mental retardation.

Materials & methods: The research was carried out on a group of 73 children. Their average age was 11.7 (SD=2.6). The condition of all children was constantly monitored and supervised by medical doctors and physiotherapists. Over 35 of them attended judo classes conducted as part of their therapies. The majority of children (59%) were characterized by mild mental retardation. The diagnostic poll method was applied in the research. The research tool was an authorial survey filled in by the parents of children suffering from mental retardation. The survey comprised of 21 questions concerning the child's physical fitness, locomotion lesions, self-care and visual-motor coordination from the beginning of the classes.

Results: Children attending judo classes made considerable progress in their ability to communicate with the environment. Improvement was also noted in the area of self-confidence and assertiveness. Differences between the judo group and the control group were statistically significant ($p<0.001$). However, distinguishable differences were not recorded in the area of pronunciation and word choice. On the other hand, patients attending judo classes exhibited considerable improvement in the ability to communicate with the environment, in the lifestyle (the ability to function within the home and neighbourhood), and in the level of socialization (the knowledge of standards and principles, as well as abiding by them, control of emotions), (in average, over 3 points – in a five-point scale). These differences were statistically significant ($p<0.001$), in reference to the comparative group. Self-care abilities (care for proper hygiene and appearance) as well as self-reliance and independence (decision-making, problem-solving) were graded, in average, at 2.5 points.

Conclusions: 1. The therapeutic value of classes in judo dedicated to children with mental retardation has not been recognized yet. However, the results achieved by a group of patients attending them clearly indicate their high effectiveness, which only confirms the primary goal of judo as a utilitarian form of movement. 2. The evaluation of therapy performed by parents clearly indicated considerable differences between the standard and non-standard therapy methods (for the benefit of judo). This only justifies the need to apply alternative forms of therapy in mentally handicapped children.

Keywords: judo • mental retardation • down syndrome • disabled sport

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Judo – means "gentle way" is a modern Japanese martial art and combat sport that was created by Jigoro Kano on the basis of the techniques of various ju-jitsu schools.

Mental retardation – a generalized disorder appearing among children, characterized by significantly impaired cognitive functioning and deficits in two or more adaptive behaviors.

Down Syndrome – genetic disorder introduces by of all or part of the third copy of chromosome 21. Children with Down Syndrome have the lower (than average) cognitive ability in the healthy population.

Disabled sport – disciplines usually based on existing sports and their rules, with modification for the disabled people.

INTRODUCTION

Classes in judo are becoming increasingly popular among children and adolescents. They are organized in special clubs, at schools, and even in kindergartens. The judo training system is very versatile and concentrates on the optimal development of general motor skills, hence allowing judo practitioners to develop a fully functional muscular corset without straining the joints. Thanks to this, judo can not only be one of the disciplines of physical education at school, a form of spending spare time, but also a form of preventive treatment against obesity, faulty posture and other civilization diseases [1-6].

Judo training sessions dedicated to the youngest children generally focus on recreation and play. The classes are based on simple exercises in judo, with elements of calisthenics, a large dose of general-development exercises, activities involving movement and other games. Exercises with partners as well as crawling strengthen all skeletal muscles responsible for maintaining proper posture. The main goal of the classes is, therefore, shaping the children's motor coordination, familiarizing them with contact with other people, and teaching them how to fall down safely [2,5,7].

Training judo has great impact on the child's physical development. Moreover, it is a system of physical training shaping the child's strong will, resilience to stress, as well as systematic approach. Martial arts also play an important role in the child's mental, moral and defensive development [1,2, 8-10].

Injuries occurring during training sessions are the only negative aspect of martial arts. However, injuries are generally specific to highly-qualified sport and occur across all disciplines [11-14].

Thanks to their universal impact on the body form as well as the utilitarian character of exercises, sports and martial arts are currently applied in various forms of activity, including therapy sessions with various groups, including the disabled [15,16]. Organized activities involving movement play an important role in the education and development of handicapped children. They can facilitate tutoring and rehabilitating patients, developing their interests and passions, and integrating them with their peers, all at the same time. This is particularly important in the case of people suffering from mental retardation [17-20].

The primary cognitive goal of the research was the effectiveness of judo sessions as a supplementary therapeutic method dedicated to children with mental retardation.

MATERIALS AND METHODS

The research was carried out on a group of 73 children (38 girls and 35 boys) suffering from mental retardation. The average age of researched patients was 11.7 (SD±2.6). The condition of all children was constantly monitored and supervised by medical doctors and physiotherapists. Group 1 – experimental (35 of the children) attended judo classes in addition to their usual therapy sessions. The children who did not attend supplementary classes were assigned to group 2 – reference group (n=38). The majority of children (n=65) were suffering from Down syndrome. The majority of children (n=43) were characterized by mild retardation. The profile of the researched groups is presented in table 1.

The diagnostic poll method was applied in the research. The research tool was an authorial survey (consisting of 21 questions), filled in by the parents of children suffering from mental retardation. The purpose of the first part of the survey was to gather information on the child itself (age, schedule and frequency of therapy sessions, cognitive, adaptive and fitness disorders). In the second part, the parents were

Tab. 1. Characteristics of research groups

groups	gender	number of people [n]	age [years]	degree of disability [n]		
				light	moderate	substantial
Group 1 (children practising judo)	girls	18	12.7 ±2.1	5	7	6
	boys	17	11.2 ±2.8	4	11	2
Group 2 (children non-practising)	girls	20	11.4 ±2.4	2	16	2
	boys	18	11.7 ±2.8	4	9	5

to evaluate (in a scale from 1 to 5 points) the progress in the rehabilitation process over the last 12 months. The questions focused on progress in physical fitness, locomotive abilities, self-care, visual-motor coordination and cognitive abilities. The following questions referred to the everyday activities performed by the child and contained the following answers: unaided, with partial aid, fully aided. The final questions regarded changes in the child's everyday functioning and the relation of the children and parents to chosen forms of therapy.

Standard statistical tools were applied in the research, including arithmetic average and standard deviation. Differences between particular data were calculated with the use of the chi-square and t-Student tests. The minimal significance level was established at the level of $p<0.05$.

RESULTS

Children participating in judo training sessions displayed considerable progress in the area of physical fitness, in each of the selected elements. The biggest differences ($p<0.001$) between the scores of the first (attending judo classes) and second (non-attending) group were recorded in the area of motor skills and muscle tonus. Considerable differences were also recorded in the area of general posture ($p=0.003$) and ability to maintain proper posture ($p=0.004$). Slightly less visible, but equally important differences ($p=0.022$) were recorded in the area of progress in coordination abilities. Minor differences were recorded only in two categories: spatial orientation and range of motion (fig. 1).

After analyzing the results of progress in the area of physical fitness of the children, taking into account their level of retardation, one may assume that judo classes have great impact on the course of therapy dedicated to children suffering from mild and temperate retardation. Children with severe retardation attending extracurricular activities have been graded higher than the children from the reference group with respect to progress in muscle tonus (boys and girls) and maintaining proper posture (girls). Differences between the grades of boys and girls (in any category) were not significant (tab. 2).

Children attending judo training sessions displayed considerable progress in the ability to communicate with the environment, the lifestyle (ability to function within home and neighborhood environment) and the level of socialization (the knowledge of standards and principles, and abiding by them, control of emotions), (in average, 3 points – in the opinion of the parents). The results were statistically significant ($p<0.001$) in reference to the reference group. Abilities related to self-care (care for proper hygiene and appearance) were graded by parents, in average, at 2.5 points. Considerable differences between the groups were not recorded only in the area of school-curriculum abilities (fig. 2).

Children (from both groups) characterized by severe mental retardation received the worst results in every adaptive category. The average of grades (in any category) did not exceed three points. Children from group 1 with mild and temperate mental retardation received the best score in the area of socialization and lifestyle. Girls practicing judo received higher scores than boys from the same group (Tab. 3).

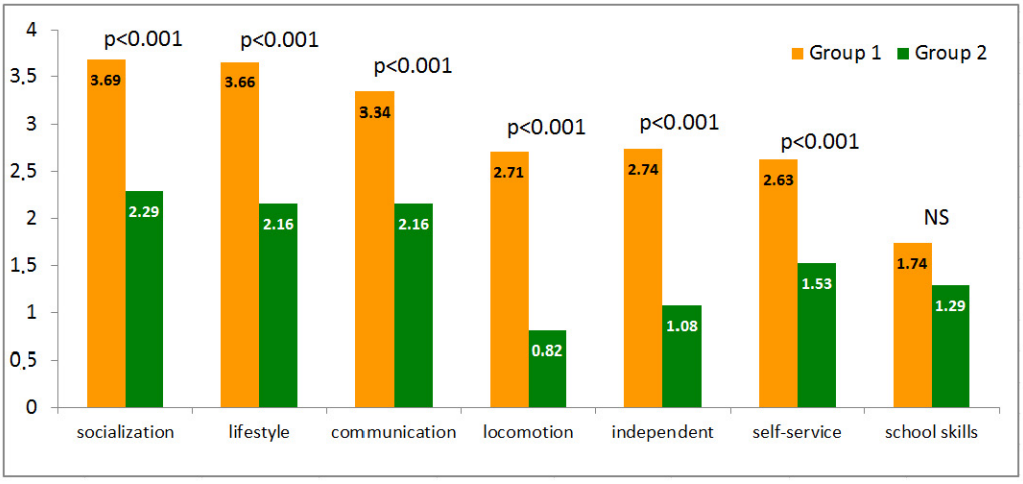

Fig. 1. Improvement of selected elements of the physical fitness of children practicing judo and non-practicing (mean values).

Tab. 2. Improvement of selected elements of the physical fitness of children practicing judo and non-practicing – having regard to the division by sex and degree of disability (mean values)

gender	degree of disability	groups	motor coordination	muscle tone	motion	improve posture	spatial orientation	range of motion	maintenance of posture
girls	light	Group 1	2.60	2.00	2.00	4.40	2.40	4.40	4.00
		Group 2	1.50	1.00	0.00	2.50	1.50	1.00	1.00
	moderate	Group 1	3.71	1.43	1.43	4.00	3.14	3.86	3.14
		Group 2	1.25	0.19	1.06	2.88	1.13	2.13	0.50
	substantial	Group 1	1.83	0.83	0.83	2.67	1.00	2.50	2.83
		Group 2	2.00	0.00	1.00	4.00	1.00	2.50	1.50
boys	light	Group 1	3.50	1.25	1.25	4.50	1.25	3.75	3.50
		Group 2	0.50	0.00	1.50	3.25	0.50	1.25	0.25
	moderate	Group 1	2.91	1.91	1.91	3.73	2.00	3.55	3.09
		Group 2	1.44	0.33	1.33	3.00	1.33	2.22	1.00
	substantial	Group 1	1.50	0.50	0.50	2.00	0.50	1.00	1.50
		Group 2	2.40	0.20	2.60	3.20	2.80	2.60	2.20

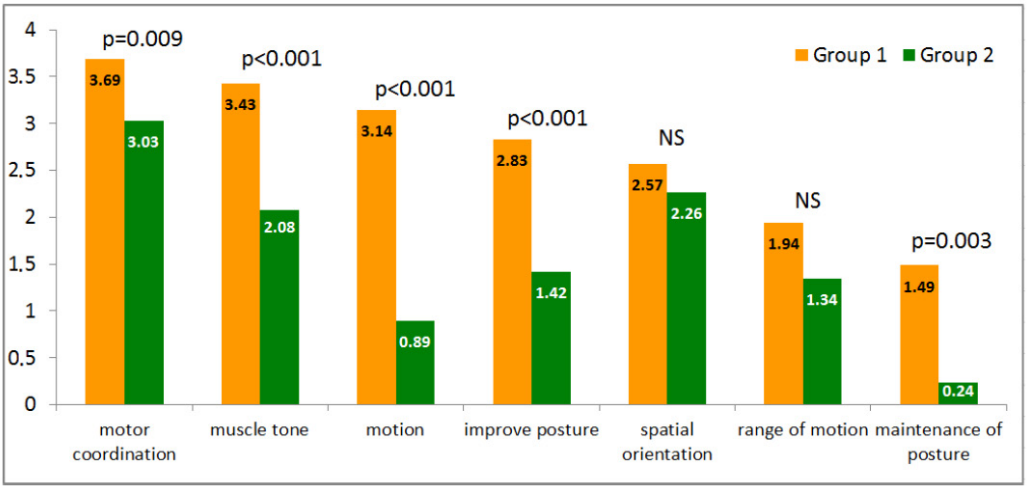

Fig. 2. Improving the adaptability of selected skills of children practicing judo and non-practicing (mean values).

Children attending judo classes made greater progress in the area of communicating with the environment, which was recorded by 80% of the parents. Significant progress was also recorded in the field of self-confidence and assertiveness (69% of the indications). The differences between the judo group and the reference group were statistically significant ($p<0.001$). Considerable differences between the groups were not recorded only in the area of pronunciation and word choice.

Evaluation of everyday activities revealed significant differences in each of the selected categories (apart from eating meals). Children from group 1 performed most of their activities fully unaided. They performed some activities (dressing up, eating meals, relieving physiological needs and washing up in the morning) with partial aid. Children from group 2 were characterized by a lower ability to perform everyday activities. Most of the children could not dress up, relieve physiological needs or wash up in the morning unaided (tab. 4).

General progress in the rehabilitation of children attending judo classes has been graded for 4.71 points

Tab. 3. Improving the adaptability of selected skills of children practicing judo and non-practicing – having regard to the division by sex and degree of disability (mean values)

gender	degree of disability	groups	socialization	lifestyle	communication	locomotion	independent	self-service	school skills
girls	light	Group 1	4.20	4.60	3.80	3.20	3.40	3.20	2.20
		Group 2	2.00	2.00	2.00	1.00	1.00	0.50	1.50
	moderate	Group 1	4.14	4.14	4.00	2.85	3.29	3.57	2.86
		Group 2	2.44	2.44	2.13	0.68	0.88	1.31	1.19
	substantial	Group 1	3.00	2.67	2.33	3.00	2.17	2.00	1.33
		Group 2	2.00	2.50	2.50	2.00	0.50	3.00	0.00
boys	light	Group 1	4.25	4.50	4.25	2.00	3.00	2.50	1.25
		Group 2	2.25	2.25	2.50	0.50	1.50	1.00	1.50
	moderate	Group 1	3.73	3.45	3.27	2.72	2.55	2.55	1.45
		Group 2	2.22	1.67	2.22	0.56	1.11	1.78	1.33
	substantial	Group 1	1.50	2.00	1.50	1.50	1.50	0.50	0.50
		Group 2	2.20	2.00	1.80	1.40	1.60	2.00	1.80

(in a five-point scale). This is much more than in the case of children from the reference group (3.55) – the differences was $p<0.001$. Children from group 1 were eager to participate in training sessions – no negative reaction to the therapy applied was recorded. The majority of children treated the judo classes as playtime. They could not wait for the next training. The therapeutic methods applied in the reference group have been taken less enthusiastically by the children. A part of them exhibited no interest in the classes whatsoever (10% of the answers) or attended the classes without enthusiasm (17%). Every third (34%) child from this group responded positively to rehabilitation sessions.

DISCUSSION

The application of martial arts in the rehabilitation process is not popular. This is, most of all, because their impact on the condition of patients has not been fully and thoroughly examined and described. We may, however, assume that this discipline will develop further and will gain more and more supporters. For instance, aikido training was successfully applied with children suffering from multi-layer spinal curvatures. Thanks to regular exercises, the symmetry of the spine and the pelvis was considerably improved [21, 22]. Positive impact of other martial arts (judo, jujitsu, karate) on shaping spinal curves has been proven [3,4,23]. Considerable improvement in the area of maintaining proper posture was recorded by the parents of the children attending judo classes as part of this research as well. The biggest differences between the groups were obviously recorded in the area of motor development. Training in martial arts may, therefore, be a way to improve and maintain physical fitness of people of all age, also the disabled [24-27].

The research proves that children practicing judo made an incredible progress in the emotional and social sphere. The biggest progress was recorded in the level of socialization – the ability to abide by social standards and principles, the control of emotions, engaging in new acquaintances as well as in the lifestyle aspect – the ability to function within home and neighbourhood environment. According to the parents filling in the surveys, the classes contributed to raising the children's self-esteem and self-confidence. The children became more assertive, they engaged in contacts with other people more easily and communicated with the environment better. Moreover, they expressed emotions better and became more self-reliant. Thanks to the presence of peers striving through similar problems, the children became more open to the environment. Healthy competition, which is an indispensable element of the judo training system, resulted in the children wanting to improve in what they were doing,

Tab. 4. Evaluation of selected activities of daily living of children practicing judo and non-practicing

	motion			
	independently	**partly independently**	**only with the help**	
Group 1	35	0	0	chi^2=12.92 p=0.002
Group 2	29	8	1	
	sitting			
	independently	partly independently	only with the help	
Group 1	35	0	0	chi^2=14.52 p<0.001
Group 2	28	8	2	
	getting up			
	independently	partly independently	only with the help	
Group 1	35	0	0	chi^2=26.98 p<0.001
Group 2	21	14	3	
	getting dressed			
	independently	partly independently	only with the help	
Group 1	20	15	0	chi^2=8.72 p=0.012
Group 2	11	24	3	
	eating			
	independently	partly independently	only with the help	
Group 1	26	9	0	chi^2=3.72 p=0.156
Group 2	20	18	0	
	settlement of physiological needs			
	independently	partly independently	only with the help	
Group 1	23	12	0	chi^2=8.73 p=0.013
Group 2	14	21	3	
	do a morning toilet			
	independently	partly independently	only with the help	
Group 1	22	13	0	chi^2=6.07 p=0.048
Group 2	13	25	0	

to stand out from the others, which, on the other hand, motivated them to work hard, to self-improve. Perhaps this is why the results for this group are so high. The impact of training in martial arts on the mental condition of the youth is scientifically proven. Various research indicates that martial arts trainees are less aggressive, rarely undertake unhealthy activities, are more assertive and resilient to stress, in comparison to people not attending any training in martial arts [9,10,28-32]. Exercises with elements of martial arts are used as an addition to the basic rehabilitation of mental dysfunctions, although this is a new direction, which has not been sufficiently researched and described yet [24,33].

Christoph Baumann [24] from the Children's and Adolescents' Psychiatric Clinic in Germany was the first one to research on the impact of judo on the development of children suffering from mental retardation. His experiment was carried out on the children staying in the stationary and out-patients' ward, who have been assigned to attend judo classes. The research was carried out on a group of 45 patients in the age of 9-13, suffering from various mental disorders (hyperactivity, attention deficit disorder, difficulties in learning, motor development disorders, emotional disorders and conduct disorders). The judo training sessions took place twice a week. During the sessions, the children developed and perfected their physical abilities. An observation of the groups under research was conducted over the three years of the course. The author of the research recorded a significant progress in motor abilities in the majority of patients participating in the experiment. He also recorded a considerable improvement in the

children's self-esteems as well as their development in the emotional and social area. Baumann claimed that, apart from the obvious curative values, one of the most important aspects of judo is that it is a form of quality time and entertainment for the children. This is why they are more willing to attend judo than other forms of therapy. At the end of the experiment, children integrated, they were able to cooperate with one another not only during the classes, but also, and most of all, in their everyday lives. It should be emphasized that judo classes contributed, to a large extent, to eradicating the social isolation of the patients caused by their diseases. After the end of the research, over a half of the children expressed will to attend in classes involving sport and physical activity, and 17 patients undertook regular training at sports clubs [24].

The search for diversified, non-standard methods of working with the disabled should lead to achieving complex and effective forms of therapy and rehabilitation. As a result of a well-chosen therapy, involving the presence of peers, children become more open to the world, to new experiences. They begin to accept their flaws and see their virtues [34-36].

Research regarding the effectiveness of the methods of supporting the therapy of children suffering from mental retardation should be continued and carried out on bigger and more diversified groups. Moreover, it should apply objective research tools and should be based on long-term observations. The research should examine the physical fitness of children, the way they move, their motor coordination, their muscle tonus and their self-care abilities, and check their progress in the aforementioned aspects after the duration of a preset period of therapy.

Non-standard methods of facilitating therapy (e.g. judo) are not very popular at the moment. There are only a few facilities which conduct extracurricular classes. This may be a serious obstacle to patients willing to undertake diversified forms of treatment. The knowledge of the medical environment of alternative forms of facilitating therapy is unsatisfactorily insufficient. Moreover, there are scarce scientific studies dedicated to this issue, which subsequently results in the lack of knowledge of the patients themselves. One of the greatest advantages of non-standard forms of therapy is the fact that, through games and play, children improve their condition in the area of physical fitness and in the area of emotional and social awareness, which are not achieved through typical therapy. Hence, alternative forms of facilitating therapy result in improving the child's quality of life in a pleasant way, which is generally the primary goal of 21st century therapy [16].

CONCLUSIONS

Classes in judo dedicated to children with mental retardation are a therapeutic form which has not been fully recognized yet. However, the results achieved by the group of children participating in the research indicate its high effectiveness. This confirms the source goals of judo as a utilitarian form of movement.

Evaluation of the therapy performed by the parents indicated considerable differences between the standard and non-standard therapy methods (for the benefit of judo). This justifies the need to seek other, alternative forms of facilitating therapy for handicapped children.

The research conducted may serve as the basis for further scientific exploration – cyclic research on larger, randomized groups, applying objective research tools.

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