

Martial arts as methods of physical rehabilitation for disabled people

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Summary

The origins of disabled sports date back to the nineteenth century. Compared to the Olympic sport, it has much shorter tradition, although the idea of using physical activity in rehabilitation of disabled people has developed rapidly. It is due to the foundation of the International Paralympic Committee in 1989, which inaugurated a new trend in dealing with disabled athletes in terms of sporting, social, professional and scientific aspects. A number of sports for disabled people have been created for the past several decades, some of them, seemingly inappropriate for people with impairments, such as martial arts and strength sports. However, it appears that fencing and judo, as well as arm-wrestling are sport disciplines successfully practised by disabled people. They are a great alternative for those lonely, idle and helpless people. They are also an opportunity for comprehensive rehabilitation. A sport training has primarily a curative, preventive and psychological function. According to the opinion of disabled people, practising combat sports and strength sports gave them the opportunity to be more self-sufficient, assertive and financially independent. Their self-esteem has improved due to the sport, they feel important and needed. The research shows how important the sport is for disabled people; according to these studies the athletes themselves gave up hospital rehabilitation for sport. The sport practised under the supervision of a physical therapist and a sports medicine doctor is an important part of rehabilitation and a way to a new better life [1,43,44,45].

The aim of this study is to present a selection of martial arts used for physical rehabilitation of disabled people. Based on the available scientific literature, we attempt to show and verify the values of sports practised by disabled people (illustrated with examples of the above-mentioned sports disciplines).

Introduction

Fighting off or avoiding the complications associated with illness or accident, restoring the maximum physical function and regenerating the motor functions, which have been affected, are the key objectives of physical rehabilitation. An equally important task is to adapt disabled people to difficult and entirely new living conditions that force us to come to terms with the loss of physical fitness. Accomplishing the goals of therapeutic rehabilitation requires a team of specialists, both medical and paramedical, to cooperate closely; and just taking care of people affected by disability should be interdisciplinary. Over the years there has been a debate over the possibility if disabled people can go in for sports. Originally, the physical activity was used for the rehabilitation and rapid restoration of health. Sport activities of disabled people, however, have become a therapeutic and prophylactic factor, and the training itself can be a continuation of hospital treatment [1-7].

Sport activities for disabled people have gained importance as a method of comprehensive physical rehabilitation. Sports disciplines should be selected depending on the state of health and functional capacity of patients. Scientific stud-

ies, describing this form of rehabilitation, suggest that by choosing the appropriate sport and by taking into account the body functional capacity, sport for disabled people is one of the best forms of continuing care and rehabilitation. They mention also that people who exercise can improve and maintain (due to sports) their physical fitness, and consequently the increased physical activity is important to compensate for the lost functions. Sport that is practised by disabled people increases their endurance and strength, which guarantees their self-reliance in life [1-7].

The aim of this study is to present a selection of martial arts used for physical rehabilitation of disabled people. Based on the available scientific literature, we attempt to show and verify the values of sports practised by disabled people (illustrated with examples of the above-mentioned sports disciplines).

Rehabilitation and sports

Physical activity is extremely important for human health in the broad sense. Disabled people, due to the nature and extent of their illness, are bound to reduce most forms of exercise. Frequently, this makes them self-contained and reluc-

tant to take any action. In spite of this, therefore, their physical activity should be increased in order to improve health, physical and mental condition, as well as their functioning in everyday life [8-10].

„Motor rehabilitation is a process aimed at restoring, improving or maintaining the psychophysical performance of temporarily or permanently disabled people, using special treatments and exercises” [11].

While defining the tasks and objectives of sports for disabled people, you should pay particular attention to the physical activity that has the following functions:

- therapeutic,
- anatomical-physiological,
- educational-psychological,
- integration,
- compensatory [12].

Many authors [1,2,12,13,14] believe that with proper selection of sports that are adequate to the type of dysfunction of disabled people, as well as to the functional capacity of organs involved in training, sport for disabled people is the best form of follow-up treatment and rehabilitation of the patient.

A large part of Polish athletes with a physical disability, who compete in the Paralympic Games, have given up their hospital and health resort rehabilitation; and in their opinion sport has prevented development of the disease [1].

An anatomical and physiological function of physical activity means in particular the activity, which allows you to maintain appropriate parameters for the entire body. With increased physical activity:

- the risk of heart disease can be reduced by improving blood circulation,
- weight control is facilitated,
- cholesterol levels are lowered,
- maintaining the blood pressure within the normal range is facilitated,
- the bones are strengthened and osteoporosis can be prevented,
- resistance to stress is increased,
- falling asleep is facilitated, sleep quality is improved,
- general physical and mental state is improved, optimism is increased,
- muscle strength is increased,
- overall physical performance is increased [8].

Sport activities of disabled people affect human mental state. Due to physical activity disabled people become more independent and buoyant. Participation in the sports competition allows you to forget about everyday problems, including those problems that are related to motor dysfunction, or disease [8]. This is confirmed by research into disabled women, which was conducted by Joanna Sobiecka. The author has shown that sport practised by the people tested has contributed to the acceptance of their disability. It has also helped to develop their comprehensive interests, and willingness to continue education and professional development [1,15].

One of the purposes of sport for disabled people is the integration. Sport creates many opportunities for integration

into the society, both among other athletes, as well as on a daily basis at school, work, and in other public places which have never been visited by disabled people before the period of their training. A sports community by organizing meetings, competitions, common for able-bodied people and disabled people, allows you to participate and compete together in the sports contests. Sometimes at such competitions disabled athletes perform better than non-disabled athletes, and this gives the disabled athletes reasons for further training and keeps them in the belief that disabled people cannot be considered as worse, because even in sports they may do better than healthy people [16].

An equally important aim of disabled sport is the compensation that triggers natural alternative possibilities that exist in every human being. Using the appropriate exercises disabled people can successfully compensate for lost functions. This is important not only for people with reduced mobility, but also for the blind. People with visual impairment can perfectly compensate the lack of vision by developing the ability to use other senses, and thus, they have better spatial orientation [1].

Fencing

Fencing is a discipline that has a rich tradition in the sport. A fencing tournament was featured already during the first modern Olympic Games in Athens in 1896. The sport of fencing is divided into three weapons: foil, épée and sabre, which in addition to the type of weapons also differ in the target area and refereeing rules [17].

Fencing matches take place on a strip, called a 'piste', that is 14 meters long by 1.5-2 meters wide. At the beginning, the fencers salute each other before putting their masks on to begin a bout. There are several methods of doing this, but the most common is to bring the sword in front of the face so that the blade is pointing up in front of the nose. And the fencers shake with the non-sword hand after a bout. Beginning of each combat and its resumption, after having granted one of the players a point, starts with the fencers standing on the so-called fencing posture line. A valid point is registered by special electronic scoring boxes. Each weapon also has different rules for where hits can count [18].

Wheelchair fencing is one of the first sport disciplines practised by the disabled people. Its origins date back to 1948, i.e. the period after World War II, when wheelchair fencing was introduced in the rehabilitation centre in Stoke Mandeville founded by Dr. Ludwig Guttmann, and it was considered a method and form of rehabilitation. Fencing was very popular among the patients, who were war veterans and former soldiers. Competitions and fencing duels held in the hospital had many advantages, they helped patients release their emotions, overcome stress caused by disability itself, and improve their self-esteem. They also nobilitated former soldiers and increased their self-confidence. Last but not least, fencing has given disabled people the opportunity to get physically fit [19].

Wheelchair fencing was one of the Paralympic sport disciplines and appeared at the first Paralympic Games in 1960 in Rome. However, its rapid development occurred in the 1990s of the twentieth century. This was due to the teams from Asia that joined the competition, in addition to players from Europe. Currently, wheelchair fencing is practised in Europe, Asia, Australia, North and the South America; and the disabled athletes compete alongside able-bodied fencers [20].

Wheelchair fencing is an extremely dynamic sport discipline, involving many muscle groups. It is characterized by the action of the upper limbs and torso, a variety of movements, great speed and action changing fast. All these elements provide interesting sports spectacle. Currently the fencers from Hong Kong and China present the highest technical advancement [20,21].

Theory and methodology of teaching wheelchair fencing is similar to fencing for able-bodied people. Similar rules and technical elements (attacks, ripostes, combinations of actions) apply in it. Mental preparation plays an important role both in wheelchair and able-bodied fencing. Rules of the International Fencing Federation (FIE) are obviously modified for disabled people. Wheelchair fencing features three different weapons: foil, épée and sabre; but the sabre is reserved for men only. In addition to the competitions that are split by gender, the wheelchair fencers are divided into three categories, according to the different level of impairment:

- Category A – people after lower limb amputation or paraparesis, having ease of movement of the torso and upper limbs,
- Category B – athletes with spinal cord injury with paraparesis and/or paresis of the upper limbs,
- Category C – the disabled with complete paralysis of lower limbs and upper limb paresis (they cannot participate in the Paralympic Games) [19,22].

All fencers wear the regular outfit and equipment and additional cover for the lower limbs. Hits are also indicated by equipment electrically coupling the players' weapons and clothing. Valid hit is similar (a foil targets the torso; an épée targets the entire body, including clothing and equipment; a sabre targets the entire body above the waist). Wheelchairs, on which the fencers sit, are attached to the special fencing platforms so that athletes can make fast and dynamic movements, without collapsing. It seems that the distance between the fencers is fixed. A very intensive action of the torso provides great opportunities and it replaces the footwork of able-bodied fencers; moreover, aggressive swings forward and the rear wheel deviation correspond to lunges and escape moves [23, 24].

The development of wheelchair fencing is possible due to integration tournaments, which are being held on a regular basis. For many years in Poland, France and Germany there have been both regional and international joint social events for able-bodied and disabled people, which are popular among the fencing community. According to the able-bodied athletes the wheelchair competition has many advantages. They claim that it contributes to strengthening the arm, improving the speed of reaction and fighting skills at close dis-

tance. Wheelchair fencing is much more dynamic and due to the small distance between the competitors and the inability to escape on foot, it requires an action of the torso, which is often used by disabled athletes when fighting with able-bodied fencers. At such competitions the able-bodied athletes are fighting with each other normally; but if the able-bodied fencer meets with an athlete in a wheelchair, then the able-bodied player also fights in a wheelchair to equalize opportunities. This allows you to fight from the same position, reduces the differences between players, and also shows that equal opportunities are possible. An example of such combat was an integration duel organized during the World Cup in 2006 between the best female épée fencer in a wheelchair – Yu Chu Yee from Hong Kong and the world épée champion – able-bodied fencer Danuta Dmowska, that was won by a disabled representative of Hong Kong 15:10 [25-27].

The importance of sport in the rehabilitation of disabled people cannot be overestimated. It may be a part of the overall activation process, which is necessary during rehabilitation. It plays an important role in accelerating and controlling the compensation, adaptation and regeneration processes. Wheelchair fencing practised by disabled people helps improve overall physical fitness, increase muscle strength, make ligaments and muscles more flexible, enhance physiological parameters, and in particular it prevents complications associated with inactivity and maintains physical fitness already acquired. People who are engaged in this sport discipline, improve their physical performance during a hard training so that they become more independent in life, which is the basis for the continuation of their social or professional work [2,28].

Besides the physical benefits associated with improving the body condition, the role of wheelchair fencing should also be emphasized. Integration tournaments which are being held are a very good way for disabled people to go beyond the disabled community. It gives them the opportunity to open up to other people, and it is a chance to forget about their disabilities and to raise their self-esteem [2,28].

Judo

Judo is a sport created in Japan. It is derived from Jujitsu – an ancient martial art. Professor Jigoro Kano is considered to be the founder of this combat sport; he collected, systematized and improved techniques of various schools of ju-jutisu giving them (in 1882) a common name – judo. Jigoro Kano eliminated the techniques that could be a threat to life and health of the athletes, introducing many new techniques [29-31].

Rules applicable in the modern judo are based on principles of old Japanese close combats. Although it is derived from the wartime martial arts ("a life-or-death battle"), at present the most important goal of this discipline is to use judo techniques to self-defence. At the same time a systematic judo training gives the possibility of a comprehensive physical development and achieving high performance during competitions. The most important goal, which is "self improvement", put forward by the creator Jigoro Kano should be remem-

bered [32]. Practising judo promotes comprehensive development of both the motor features (strength, speed, stamina, physical coordination, suppleness) and volitional traits (composure, self-control, concentration, perseverance, resilience, courage), and so it can provide a comprehensive system of education for the young people [32-34].

Judo is the only discipline for disabled people, designed mainly for visually impaired or blind athletes. It might seem that Judo is not the appropriate sport discipline for blind people. However, it appears that they practise this demanding sport, and even compete with able-bodied athletes, succeeding on the tatami [35-36].

Judo was started to be taught to the blind people worldwide in the 1980s of the twentieth century. Judo for the visually impaired was introduced at the Paralympic Games in 1988 in Seoul – such as judo for able-bodied athletes. Men and women participate in the competitions separately; the women competed in the Paralympic Games for the first time in Athens in 2004 [35].

The rules of judo for able-bodied and blind people are very similar. They differ in that there is a physical contact between blind opponents even before the beginning of the fight. Fight time in the senior category takes 5 minutes and the Judo practitioners use kicks and holds, thanks to which they score points. The winner is the person who scores the ippon first or who gains a greater number of points (*waza-ari*, *yuko*) [37,38].

Slightly more different is a training process of the blind athletes. Although visual impairment does not prevent the coaching of this discipline, learning the techniques takes a long time and requires a lot of patience, and above all the appropriate approach of the coach and practitioner. With a little help and motivation, blind people can derive just as much pleasure from the training as sighted people. Judo is a unique sport for the blind, because in practice, even sighted people cannot always rely on the senses of sight. More often the decisive factor is to feel the opponent using physical contact. Blind people have the advantage in this field because their sense of touch and the ability of spatial orientation are much more developed. Methodology of the judo training for the blind is based on the fundamental principles of training for the blind in any sport discipline. The bottom line is that all information must be communicated using specific verbal descriptions and presented individually to each practitioner. Multiple repetitions of verbal instructions allow you to locate a coach on the mat. The function of the coach is even more difficult, because it is easy to offend a blind person. To avoid such a situation, the coach should offer his assistance only if the practitioner wants it. Blind people want to participate in classes on the same conditions as able-bodied people and they expect the same requirements and maximum effort. An important psychotherapeutic factor for the blind is integration with the community, and it can be provided by training sessions with sighted people [38].

The main task of rehabilitation of the visually impaired people is to compensate for the loss of sight using other senses and to teach how to perform auxiliary activities used in

everyday life. Sport practised by people with visual impairment plays an important role in long-term process of rehabilitation and provides many benefits that contribute to improving the quality of life. Regular physical activity of visually impaired people has a positive influence on motor compensation, motor skills, comprehensive development of the body, an increase in spatial orientation, an improvement in well-being and acceptance of one's health, an improvement in concentration, an increase in sense of control, as well as on the shaping of personality. People, who practise judo, are less stressed out and anxious and they are less likely to experience symptoms of depression, hostility and anger. Another benefit from practising sport is the fact that blind people become independent in the social environment, they start to be professionally active again, they fulfil family responsibilities and take up social roles. Blind people, engaging in sports, confirm that it is beneficial and improves their functioning, and their global quality of life is more satisfactory than those who do not exercise. To participate in sports camps and competitions is also very important. Sports camps contribute to the integration of people with similar problems, and sport competition shapes the objective self-esteem and reinforces the belief in self-esteem [39, 40].

Arm-wrestling

The origins of arm-wrestling go back to ancient times. To test one's strength in close combat is so common that most people in the world have tried this kind of competition at least once in a lifetime. Arm-wrestling is most often associated with having fun in the bar, in the backyard, or during folk events. A breakthrough to overturn this stereotype was the year 1951, when Dave Devoto and Bill Soberanes organized competitions for truck drivers. This was the first professional arm-wrestling tournament. Then, in 1962 in Petaluma (USA) the first international tournament was held, and then the first federations of arm-wrestling were founded. Currently, World Armwrestling Federation (WAF) is the governing body of arm-wrestling, and it brings together 70 countries, including Poland. European Armwrestling Federation (EAF) was founded in 1991, and it organizes championships in Europe [41,42].

Arm-wrestling in Poland started in 1999, when Igor Mazurenko received a proposal to organize a tournament between Ukraine and Poland from Ukrainian Armwrestling Federation. After lost duels, Poles decided to open the first arm-wrestling club, and one year later EAF entrusted them with organization of the 10th European Championships. However, the biggest success of the FAP (Armwrestling Federation of Poland) was the 22nd World Championships, the largest in the history of WAF, which took place in Gdynia in 2001 [41,42].

Arm-wrestling duels are played according to strict rules. Arm wrestler costumes should consist of tank tops or T-shirts, shorts or tracksuit pants and trainers. People taking part in the tournament must not wear any bandages, bands, braces or jewellery on their upper limbs. Each battle takes place at a special table. Up to 1993 the world championships the com-

petitors had to stand up and sit down again. Currently, able-bodied athletes fight standing up and the sitting position is reserved for disabled people. An arm-wrestling table is made of very durable materials, because a significant load occurring during duels are transferred to its construction. Table height is fixed at 101,6 cm. The specially reinforced wooden top is covered with rubber and abrasion-resistant artificial leather, and its dimensions are 91,5 x 66 cm. Two armrests, two side pads and two steel handles for a non-wrestling hand are attached to the table top. There should be a stand with magnesia block beside the table, which is used for rubbing on the hands and elbows in order to avoid slipping the hand out of a handle and to improve elbow support on the armrest. The result of an arm-wrestling duel is decided by two referees, i.e. a side referee, called the assistant referee, and a main judge [41,42].

Arm-wrestling is a little-known sport discipline for disabled people. Few people realize that arm-wrestling, apparently considered as a sport for able-bodied and very strong people, can be practised by disabled people in a wheelchair. This sport has been trained in Poland before long, but already in 2001, the Polish national team of disabled athletes won the second place in the European championship [41].

Competitions for disabled people take place at the same time as for able-bodied armwrestlers. They are a separate category and, like the other players, they are divided by gender and weight. In the group of disabled women there are two weight categories: up to 75 kg and above 75 kg, and in the group of men: up to 78 kg and above 78 kg. Disabled athletes must observe the same rules as able-bodied armwrestlers. The only significant difference is the way of playing the competitions, which since 1994 has been clearly distinguishing disabled people, who arm-wrestle in the sitting position, from able-bodied athletes, who arm-wrestle while standing up [41].

An arm-wrestling table designed for disabled people is lower (71,1 cm high), while the top keeps its fixed dimensions. It contains all the fixed elements: two armrests, two side pads and two steel handles. Players can sit at a table in a chair without a back or in their wheelchairs [41].

The results of duels are decided by two referees. The same principles of announcing the win and granting warnings apply here. In the category of disabled people, an arm-wrestler can also be given a foul for the same offenses as an able-bodied athlete, and additionally, when they get up from a chair or wheelchair [41].

Arm-wrestling is a sport discipline for everyone, also for a disabled person. It can successfully be a form of rehabilita-

tion, and the best example is the case of Maciej Gralak. This 21-year-old disabled athlete (walking on crutches) has many achievements, including the Polish championship and the second place in Europe. In addition, he was elected Athlete of the Year 2009 by Armpower.net (the largest sports service dedicated to the wrestling). The athlete himself recommends arm-wrestling to disabled people. He believes that endurance, strength, performance and technical training is a perfect complement to rehabilitation, and it may even replace rehabilitation, as in his case. Maciej Gralak praises arm-wrestling as a sport in which there is neither division nor discrimination. Disabled people do workouts all the time, and this helps them forget about their dysfunction. As in many other sports, disabled people may compete together with able-bodied athletes here also. Maciej Gralak while competing with able-bodied athletes during Poland Championship got two bronze medals [42].

Conclusions / Recapitulation

The origins of disabled sports date back to the nineteenth century. Compared to the Olympic sport, it has much shorter tradition, although the idea of using physical activity in rehabilitation of disabled people has developed rapidly. It is due to the foundation of the International Paralympic Committee in 1989, which inaugurated a new trend in dealing with disabled athletes in terms of sporting, social, professional and scientific aspects. A number of sports for disabled people have been created for the past several decades, some of them, seemingly inappropriate for people with impairments, such as martial arts and strength sports. However, it appears that fencing and judo, as well as arm-wrestling are sport disciplines successfully practised by disabled people. They are a great alternative for those lonely, idle and helpless people. They are also an opportunity for comprehensive rehabilitation. A sport training has primarily a curative, preventive and psychological function. According to the opinion of disabled people, practising combat sports and strength sports gave them the opportunity to be more self-sufficient, assertive and financially independent. Their self-esteem has improved due to the sport, they feel important and needed. The research shows how important the sport is for disabled people; according to these studies the athletes themselves gave up hospital rehabilitation for sport. The sport practised under the supervision of a physical therapist and a sports medicine doctor is an important part of rehabilitation and a way to a new better life [1,43,44,45].

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