THE IMPORTANCE OF RECREATIONAL SPORT AND SPORTS PROGRAMS DURING REHABILITATION AND POST-REHABILITATION OF THE PHYSICALLY DISABLED

Stjepan Heimer and Mirko Relac

Faculty of Physical Education,
University of Zagreb, Zagreb, Croatia

Profesional paper
UDC: 796.035(362.65)
Received: June 12, 1997
Accepted: March 12, 1998

Abstract:

This paper gives the survey of the contemporary approach to the application of sports-recreational and sport activities during and after the rehabilitation of the persons with a disability. Special attention is paid to the results of the scientific researches of the influence of sports-recreational programs on the improvement of psychological, functional and motor characteristics of persons with a disability. The suggested procedures are directed towards the application of the sports-recreational programs for the improvement of the psychosomatic characteristics during the clinical rehabilitation, immediately after such rehabilitation, as well as upon the arrival at home. The roles of the organization 'Sport for all' and of the wider social environment are emphasized in this paper – the designing of organizational, professional and executive procedures necessary for engaging the persons with a disability into the programs which apart from their medical effects also have the goal to increase the quality of life, among other things by establishing the communication with other people and by raising the level of self-acceptance.

Key words: persons with a disability, sports recreation, fitness, functional abilities

Zusammenfassung:

DIE BEDEUTUNG DES SPORTS UND DES ERHOLUNGSSPORTS WÄHREND UND NACH DER REHABILITATION DER BEHINDERTEN PERSONEN

Die Entwicklung des zeitgemäßen Zugangs zur Benutzung sowie des Sports als auch des Erholungssports während und nach der Rehabilitation der behinderten Personen wird in diesem Artikel besprochen. Die besondere Aufmerksamkeit wurde den Ergebnissen der wissenschaftlichen Forschungen über den Einfluß des Erholungssportsprogramme auf die Verbesserung der psychischen, funktionellen und motorischen Eigenschaften der behinderten Personen geschenkt. Die vorgeschlagenen Maßnahmen sind auf die Anwendung der sportrekreativen Inhalte zur Verbesserung der psychosomatischen Eigenschaften während der klinischen Rehabilitation, unmittelbar danach und nach dem Rückkehr nach Hause gerichtet. Betont wird die Rolle der Organisation "Sport für alle" sowie der Sozialgemeinschaft beim Ausarbeiten von den Organisations- und Durchführungsmaßnahmen sowie bei der Versicherung der materiellen und anderen Bedingungen, die für das Einschließen der behinderten Personen in die Programme notwendig sind. Neben der unmittelbaren heilenden Wirkung, zielen diese Progamme auch zur Verbesserung der Lebensqualität, unter anderem durch das Anknüpfen neuer Gesellschasftverbindungen und das Stärken des Selbstbewußtseins.

Schlüsselwörter: behinderte Personen, Sport, Erholungsport, Fitness, funktionelle Fähigkeiten

Introduction

Training and fitness activities for the disabled entail a whole range of both medically indicated and optional procedures, ranging from those being an integral part of the medical treatment and rehabilitation to those whose primary aim is to raise the level of physical and psychosocial health, in other words the improvement of the quality of everyday life upon the termination of hospital treatment. The aim of the therapy-related programs is to accelerate and advance the procedures of medical rehabilitation, render the patients capable of a better physical independence and foster confidence in their own capabilities and prospects. Optional treatment has on the one hand a supplementary role to the medical treatment and on the other hand,

apart from its physical and kinesiological role, it removes the feeling of helplessness and abandonment, by gradually developing feelings of stability, self-respect and social integration. Participation in adapted sports competitions, from those at the local level to the national, international and Olympic level, contributes, along with the recreational activities, to social integration.

Historical overview

Sport for the disabled has its roots in the Spinal Injuries Centre of the Stoke Mandeville Hospital, England when in 1948 Sir Ludwig Guttman introduced archery as a therapeutic treatment. Guttman organized the first international competition for the physically disabled with the participation of Dutch and English paraplegics in 1950. The competition was so successful that competitions continued to take place every year, with the addition of new sports. The number of member countries increased, and in 1960 competitions moved to the Roman Olympic sports grounds, and a few years later to Tokyo. The Olympic Games for paraplegics took place in Tel Aviv, then Heidelberg where there were more than a thousand athletes from 38 countries; 44 countries participated in the Toronto Games, and in Arnheim in the Netherlands there were 2500 participants from all over the world. Today numerous regional and continental summer and winter sport competitions take place all over the world, which have been included into the regular calendar of sport events, and the top event are the Paralympic Games which take place every fourth year and attract athletes with all types of disability (Davis et al., 1993). 4000 athletes from over 100 countries entered for the Paralympic Games in Atlanta.

The impact of programmed physical activities on some sports-physiological characteristics of the physically disabled

Competitions and top level results are only a tip of the iceberg of the physically disabled included into sport programs. Much broader and from the social aspect much more important types of sport activities of the physically disabled are a province of sports recreation. Sports recreation by its facilities, intensity and locations can offer such persons numerous acceptable forms of individual and group activities which apart from being a way of spending free time have far more important objectives and aims. Sport and exercise to a great extent aid the success of medical therapy even during the process of treatment and rehabilitation in short-term stay clinics. Many years ago Weiss and Beck (1873) found that supplementary sport exercises in the course of post-traumatic treatment accelerate an increase of strength of the upper limbs rather than by using traditional physiotherapy only. Pachalski and Mekarski (1980) note that standard rehabilitation programs do not improve cardiopulmonary ability of the paraplegics whereas by applying the program of endurance by swimming four times a week during the same period four times better results are attained. There are several authors (according to Davis et al., 1993) who claim that even the use of a wheelchair for long term use in everyday activities neither stimulates to a satisfactory degree the oxygen transportation system (primarily of the cardiovascular segment) nor prevents the atrophy of the muscles of the upper part of the body.

Nakamura (1973) attributes the special importance to sport in the function of the improvement of the working achievement of the disabled persons. He presents data showing the acceleration of rehabilitation and improvement of working ability. There is much less absenteeism from work and higher monthly earnings in persons with an injury of the spinal cord practicing sport than in those with sedentary habitus.

Participation in sport activities stimulates the development of different physiological characteristics. Wheelchair athletes are not only better than their non-athletic counterparts but frequently achieve results related to aerobic and strength capacity superior to able-bodied persons with sedentary habitus (Kofsky et al., 1980; Roberts, 1974; Zwiren et al., 1973; Emes, 1977)

Marcineka's (1980) results show no difference in the physiological reaction of an organism to submaximal load between healthy students and those with a mild paraplegic injury, provided that the latter have been included into appropriate sport programs since the time they have finished their rehabilitation. According to the author's data they completely compensated for their physical impairments. Emes' (1977) results are very similar. He found that the test of working capacity (PWC170) by arm ergometer does not show any statistically significant differences between wheelchair basketball players and the healthy ones. Numerous other indicators also support the insights related to the beneficiary impact of sport activities on the structural and physiological changes of non injured parts of the locomotor system. Sports training in a certain way not only compensates for the present impairment but also enables the development of capacities which equate those in highly trained persons.

The impact of physical activity on the psychological status of the disabled

Though the issue of impact of physical activities on the mental state in able-bodied athletes is very important, it is even more so in disabled persons. In such persons the current mental status is determined by their attitudes, view points and frame of mind prior to injury. Social environment, threshold of tolerance and acceptance of healthy persons are additionally important. All that, along with the type of injury significantly affect the outcome of rehabilitation and acceptance of one's own physical status as a disabled person (Simon, 1971; Schonz, 1978; Vargo, 1978). All the aforementioned also relates to persons with an innate or traumatic disability (Harper, 1978).

Quite a few authors emphasize the positive impact of sport activities related to a better self-concept and self-acceptance. Hence, it is, with a certain caution (Davis et al. 1993), justified to rank sport activities for the disabled not only as procedures to improve physiotherapeutic but also psychotherapeutic measures.

Fitness development in physically disabled persons

While designing a program of sports recreational activities as well as sports training, it is necessary to, along with the characteristics and requirements related to the activity, know the somatic and functional characteristics of the participants taking part in a program. It particularly holds good for physically disabled persons, the knowledge of whose disability classification relative to their impairment, mental impairment neurological injuries is crucial. In this respect for the needs of wheelchair sport, medical classification of the International Stoke Mandville Games Federation, ISMGF, proved to be acceptable.

Sport physiological features present the second group of parameters when designing program activities. It is quite understandable that the majority of physically disabled persons show a lower level of certain functional and motor fitness than the general population. It is an interesting finding (Cumming et al., 1971) that persons with hearing difficulty in principle have a much more active habitus and level of fitness than their healthy peers.

Wheelchair persons significantly differ in the level of their cardiovascular capacity and muscular strength. Whereas there are those whose capacity is far below average, there are also those who can be compared with moderately trained healthy persons. Zwiren and Bar-Or (1975) compared a group of persons with a disability of lower limbs with a group of able-bodied persons. They established that there is no difference in the maximum heart frequency nor the strength of the dominant hand (right or left handed) between the disabled athletes and non-athletes. However, cardiorespiratory capacity in wheelchair athletes was only 9% lower than the one in the able-bodied, and 50% higher than in wheelchair persons not engaged in any sport activity. Similar findings are supported by a number of other researchers (quotation according to Davis et al., 1993). Lundberg (1980) found in Swedish wheelchair basketball players maximum oxygen uptake (VO2max) to be close to 47 ml/kg)min measured on the wheelchair ergometer with the concentration of the

lactose (HL) in blood of 15.5 ml/l. Wicks et al. (quotation according to Davis et al, 1993) tested a number of persons who had suffered spinal cord injuries and who were Paralympic level athletes. VO2max values varied relative to the type of injury. So the value of 14.1 ml/kg/min was found in athletes suffering from quadriplegia, whereas the value of 37.8 ml/kg/min was found in athletes with a mild type of paraplegia. In women athletes of an international level values were slightly lower. The extent of a maximum oxygen uptake ranged from 11.7 to 32.7 ml/kg/min. Glen et al. got VO2 max 25.1 ml/kg/min in wheelchair sedentary persons, and 40.2 ml O2/kg/min in wheelchair athletes. However, the data showing that for the VO2max level the extent of everyday activity is much more important than the severity of spinal cord injury which is much more challenging.

Long-lasting rehabilitation and an absence of physical activity in a medical establishment causes to a greater or lesser degree muscle atrophy and an increase of body mass. It is quite plausible that these changes, along with hypokinesia cause a decline in the cardiorespiratory (aerobic) fitness. Decreased maximal heart rate, decreased cardiac output and poor periphery circulation (quoted according to Davis et al, 1993) are some of the serious physiological deficiencies that can to a substantial degree restrain the fitness level of the paraplegics.

A significant difference between physically disabled athletes and sedentary disabled persons has been assessed in the volume of muscular strength and endurance. Davis et al. (1981) proved statistically significant difference between physically disabled athletes and non-athletes when testing muscular strength and endurance. Grimby (1980) found that the static and dynamic strength of the arms in physically active disabled persons is up to 30% higher than in an average able-bodied control group.

Yet, one should not disregard the opinions and findings of some scholars (Hjeltenes and Vokac, 1979; Knutsson et al., 1973) who report, in principle, the very low energetic and dynamogenic capabilities of the physically disabled resulting in their limited mobility in an ordinary wheelchair. No wonder then, that it is very hard to include physical activity as a complement to traditional physiotherapy in the course of rehabilitation in a number of the disabled because of their extremely low physical capabilities.

Conclusion and proposed measures

Based on the aforementioned and an overview of past research and departing from the current practice, we can conclude that meaningful procedures and social measures are essential in order to involve recreational sport and sports programs into the everyday life of people with physical disabilities. It can be done during their free time during the process of rehabilitation, during their stay in convalescent/rest centres (seaside, mountain, summer, winter etc.) and upon their return to their place of residence. Only such a comprehensive approach may yield the desired results mentioned earlier.

1. During the rehabilitation process sports recreational programs are a complement to the rehabilitation process and a very important factor of the quality utilization of free time during a stay in a medical institution. In practice, unfortunately, the patients are left to their own resources and their personal interests. Hence, special hospitals and convalescent nursing homes must lay the foundations for the introduction of the adapted program, organizational, material and personnel assumptions for sports recreational activities as an integral part of the fundamental physical and work therapy. This type of activity has been ignored for quite a long time in this environment. The first experiences have been obtained in the health (thermal) resort Varaždinske Toplice.
2. Sports recreational programs in the health resorts are particularly important in their function of the convalescence of people with physical disability. An organized and programmed active rest in numerous seaside resorts and spas may be a very efficient ingredient in the preservation and promotion of health. Meaningful programs and trained personnel are required who would at acceptable prices fill up the

vacancies in tourist destinations off season heated premises, warm closed systems and other facilities for sports recreation. Such facilities should be compulsory in the existing specialized recreation centres for the physically disabled. Unfortunately, catering is almost the only service offered by the existing centres for rest and convalescence.

3. Upon returning home, into everyday life, physically disabled persons should have the opportunities to get involved into regular sport and recreational activities several times a week. The activities can vary in purpose and can be conducted:

   a) in specialized sport centers intended for the recreation of the disabled which can function in bigger urban environments with the assistance of professionals providing services to persons with different degrees of disability;

   b) in organizations for sport activities of the physically disabled persons for the ones who want to get involved in the system of sport training and participate in appropriate competitions. Such activities are consolidated (integrated) by the Croatian Federation for the Sport of the Physically Disabled in the framework of the Croatian Olympic Committee. In this context unnecessary and frequent trips and the formation of a system on the model of the current sport should be avoided, and the international sports meetings adjusted to the current economic possibilities of the country.

   c) in all the centres for sports recreation in the framework of the committee, association or organization "Sport for all" as well as in all sport facilities of the sport organizations or clubs adapted for the activities of the physically disabled persons (particularly boules courts, bowling alleys (centres), shooting ranges, swimming pools, fitness centres, table tennis, etc.). However, adapted sport activities necessitate organizational prerequisites, in other words a number of organizers - prime movers out of the disabled who would in cooperation with the trained and qualified personnel carry out sport activities.

When planning the means from the State budget for sport activities at any level in Croatia, this activity should no doubt have priority. However, firm criteria for raising the sources should be established, primarily for the organization, personnel, facilities and only then funds for trips, apart from certain traditional sports meetings. We should aim at including as large a number as possible into activities with the other participants of sports recreation, a procedure that is already underway in some environments.

In order to accomplish the said programs it is necessary at the level of municipalities, cities, counties and the Republic of Croatia to instigate program design regarding the physically disabled and providing the means relative to each specific program and task at each and every of the mentioned levels.

For the development of "Sport for everyone" which would in the next period entail people with disability, it is necessary to do the following:

- plan areas for the construction of sport recreational centres in any large urban environment with the fundamental activity being the programs related to "Sport for everyone". The programs reflect the modern social, cultural and health needs of the people of the 21st century;

- train all profiles of personnel ranging from organizers to competent leaders with two-year post secondary school qualification and university qualification for planning and implementation of sports recreational and sport activities for the physically disabled persons.

Care for the physical activity of the disabled is not an easy task since it requires not only substantial financial means but also elaborated organizational measures, training of medical and kinesiology-related personnel and last, but not the least important, measures towards the modification of attitudes towards people with physical disability and towards their needs and wishes.

References

1. Cumming, G.R. et al. (1971). Working capacity of deaf, visually and mentally impaired handicapped children. *Arch. Dis. Chil.*, 46:490.

2. Davis, G.M. et al. (1981). Classification of psycho-physiological variables in the lower-limb disabled. *Can. J. Appl. Sport Sci.,* 6(4)

3. Davis, G.M., Jackson, R.W. and R.J. Shephard (1993). Sports and recreation for the physically disabled. *Med. Sci. Sports Exerc.* 25(4):

4. Emes, C. (1977). Physical work capacity of wheelchair athletes. *Res. Q.,* 48:209.

5. Grimby, G. (1980). Aerobic capacity, muscle strength and fiber composition in young paraplegics. In: Natvig, H. (ed.): *1st International Medical Congress on Sports for the Disabled, Oslo, Royal Ministry for Church and Education.*

6. Harper, D.C. (1978). Personality characteristics of physically impaired adolescents. *J. Clin. Psychol.,* 34:97.

7. Hjeltnes, H. and Z. Vokac (1979). Circulatory strain in everyday life of paraplegics. *Scand. J. Rehabil. Med.,* 11:67.

8. Knutsson, E. et al. (1973). Physical work capacity and physical conditioning in paraplegic patients. *Paraplegia,* 11:205.

9. Kofsky, P.R. et al. (1980). Cardiorespiratory fitness in the lower limb disabled. *Can. J. Appl. Sport Sci.,* 5(4)

10. Lundberg, A. (1980). Wheelchair driving - Evaluation of a new training outfit. *Scand. J. Rehabil. Med.,* 12:67.

11. Marcinek, C.R.T. (1980). Exercise testing of paraplegic sportsmen. In: Natvig, H. (ed.): *1st International Medical Congress on Sports for the Disabled, Oslo, Royal Ministry for Church and Education.*

12. Nakamura, Y. (1973). Working ability of the paraplegics. *Paraplegia,* 11:182.

13. Pachalski, A. and T. Mekarski (1980). Effect of swimming on increasing of cardio-respiratory capacity of paraplegics. *Paraplegia,* 18:190.

14. Roberts, K. (1974). Sports for the disabled. *Physiotherapy,* 60:271.

15. Schonz, F.C. (1978). Psychological adjustment to physical disability: Trends in theories. *Arch. Phys. Med. Rehab.,* 59:251.

16. Simon, J.I. (1971). Emotional aspects of physical disability. *Am. J. Occup. Ther.,* 25:408.

17. Vargo, J.W. (1978). Some psychological effects of physical disability. *Am. J. Occup. Ther.,* 32:31.

18. Weiss, M. and J. Beck (1973). Sport as a part of therapy and rehabilitation of paraplegics. *Paraplegia,* 11:166.

19. Wicks, J.R. et al. (1981). Elite spinal cord injured athletes (according Davis et al., - literatura pod 2)

20. Zwiren, L. i O. Bar-Or (1975). Responses to exercise of paraplegics who differ in conditioning level. *Med. Sci. Sports,* 7:94.

21. Zwiren, L.D. et al. (1973). Cardiopulmonary functions of sedentary and highly active paraplegics. *Med. Sci. Sports,* 5:63.