Journal of Physical Education and Sport ® (JPES), 17(3), Art 184, pp.1892 - 1898, 2017
online ISSN: 2247 - 806X; p-ISSN: 2247 – 8051; ISSN - L = 2247 - 8051 © JPES

Original Article

Ways that people with a chronic spinal cord injury participate in sport in the Republic of Slovenia

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Published online: September 30, 2017
*(*Accepted for publication September 03, 2017
DOI:10.7752/jpes.2017.03184

Abstract:
Regular physical activity of persons with physical disabilities brings physical, health, social, and psychological benefits. The purpose of the research was to determine the effects of spinal cord injury on dealing with sport and the inclusion of adults with spinal cord injury in the field of sports in Slovenia. We were interested in differences regarding the level of spinal cord injury, current age, the age when spinal cord injury occurred, the years of disability and gender differences. The study relies on descriptive and causal-non-experimental methods of empirical pedagogical research. The sample consists of 125 persons with genetic and acquired spinal cord injury aged 19 to 70. The results findings indicate that the frequency of sports engagement increases after spinal cord injury, for example, the recreational sport is reduced after spinal cord injury and the sports engagement at a competitive level is increased. The greatest influences on dealing with sport have the functional capabilities of an individual associated with the level of spinal cord injury. The results of this research suggest that in order to increase the inclusion of persons with physical disabilities in the field of sports in Slovenia, it is necessary to establish a systematic training system for all those related to sports activities, from kindergarten teachers to teachers of classroom education, sports teachers, and trainers of various sports disciplines.
Key Words*:* Sport, persons with disabilities, spinal cord injury, recreational level, competitive level.

Introduction

Physical inactivity is nowadays a global health issue that causes many diseases. Less active are women, older adults, individuals from lower socio-economic backgrounds and persons with disabilities (World Health Organization, 2003). Regular physical activity improves general health, reduces the risk of many diseases, strengthens bones and muscles, lowers blood pressure, slows heart rate, increases lung capacity, improves immune system, balance, and coordination of movements. It also improves psychophysical abilities, affects overall well-being and the quality of life. Good physical fitness is particularly important in times of serious health problems or disabilities because it prevents the development of new functional limitations (Fentem, 1994; Nemcek, 2016; Marincek, 1981, Sherrill, & Williams, 1996). Sport has a positive impact on the development of positive self-esteem and positive self-image, enables the increased control of self-determination and social inclusion and has a positive impact on the quality of life of persons with disabilities since it equips them with important lifelong knowledge and empowers them for social integration in the community (Rimmer, Braddock, & Pitetti, 1996; Sherrill, & Williams, 1996). Physical inactivity of persons with disabilities is also limited by architectural barriers, social exclusion and the trend of physical inactivity (Fentem, 1994). High quality physical education in childhood and adolescence gives an important contribution to educational achievements, to the whole personality development and the health of the child with disabilities, influences movement development and builds the foundation for dealing with sport in adulthood, affects social and cognitive development, prevents behavioural problems and brings others long-term benefits (Doll-Trepper, & Scoretz, 1999). Inclusive physical activities are crucial for social integration since it allows society to accept differentiation and increases tolerance on one hand and it allows persons with disabilities greater independence and increases their self-image on the other hand (Bürgel, & Carstens, 2012; Faganel, & Tusak, 2004; Sherrill, & Williams, 1996). Introduction should be comprehensible to the general reader. Give a clear statement of the purpose of the paper and provide relevant context to support the basis for the paper and the significance of the work. Do not exhaustively review the literature.

In Slovenian primary and secondary schools the inclusion of children with physical disabilities in the field of sports is determined by the legislation, but due to the inaccessibility of the infrastructure and the

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professional competence of sports personnel is often of poor quality and inefficient (Filipcic, 2006; Kolar, Jurak, & Kovac, 2010; Krivonog, 2013; Stiftar, 2014; Strumbelj, & Zakrajsek, 2012; Verhovnik, 2012).
The main organization for the majority of sports for the persons with disabilities is the Paralympic Committee of Slovenia - Sports Federation for the Disabled of Slovenia. Research shows that the sport of persons with disabilities in Slovenia is rising (Strumbelj, & Zakrajsek; 2012).
There is no systematic education of personnel in the field of sports for persons with disabilities in Slovenia. Subjects that are related to the education of sports for persons with disabilities are at the faculties only optional. The best knowledge of sports activities for persons with disabilities is provided by special and rehabilitation pedagogues as well as by class teachers in primary school (Fidler, 2016).
The main purpose of the research was to determine the effects of spinal cord injuries (SCI) on dealing with sport and the implementation of inclusion of adults with chronic SCI in the field of sports in Slovenia. We were interested in differences regarding the level of SCI, current age, the age when SCI occurred, the years of disability and gender differences.

Material & methods

The study relies on descriptive and causal-non-experimental methods of empirical pedagogic research. The research approach is quantitative.
The participants in this study were members of the Slovenian Paraplegic Association. At the level of the applied inferential statistic, the sample was considered as a sample, random sample from the hypothetical population. The hypothetical population is infinite, and it is similar to our sample. There were 150 questionnaires distributed, of which 125 were fully completed and valid. The sample (N = 125) includes respondents with genetic and acquired SCI, thereof 66.1% males and 33.9% females.

The sample (N = 125) represents adults aged 19 to 70, the average age of participants is 46.2. The maximum age of the respondent to receive SCI is 60 years, some respondents had it from birth and the average age is thus 24.0. The minimum period of disability of respondents is 1 year, the maximum is 60 years, and the average is 22.8 years. The sample covers 8.7% of persons with Cervical SCI C1-C4, 23.6% of respondents with Cervical SCI C5-C7, 14.2% of respondents with Thoracic SCI T1-T5, 22.0% of respondents with Thoracic SCI T6-T11, 20.5% of respondents with Lumbar SCI T12-L3, and 3.9% of respondents with SCI below L4. The sample covers the majority of respondents with paraplegia (55.9%), fewer respondents with tetraplegia (19.7%), tetraparesis (13.4%), and paraparesis (11.0%). 79.5% of respondents use a manual wheelchair, 21.3% of them use an electric wheelchair, 15.0% of them use crutches or other stents, 1.6% of them for the movement does not need accessories. 17.3% of respondents have primary or lower secondary education, 20.5% of them has secondary and postsecondary non-tertiary education, 62.2% of them has tertiary education. 62.2% is retired, of which 58.3% retired before SCI appearance. 24.4% of the respondents are employed, of which 16.5% are part time employed, 7.9% are full time employed. 7.1% of the respondents are unemployment. 4.8% are students.
The first data were experimentally gathered with a questionnaire on a small sample (N = 8). Based on the comments, we repaired the questionnaire, tested experimentally on a new sample (N = 10) and prepared the final form and at the final meeting in December 2014 at the end of the year, it was answered by the members of the Paraplegic Association of all regions. The survey was conducted anonymously and voluntarily. It was carried out individually and unguided.

The questionnaire consists of 44 questions: 3 open questions and 11 multiple-choice questions with one answer and 30 questions with three or four-point scales. The first part of the questionnaire consists of the questions related to the independent variables, the second part of the question is linked to the factors of occupational choice of persons with SCI, and the third part issues the involvement of persons with SCI in sports. This paper presents a part of the involvement of persons with SCI in sports.
The validity of the questionnaire was provided with a review of existing literature and with the experimental use. The objectivity was provided with the multi-choice questions with given answers, with open questions for which answers are short and with the implementation of data collection, which was individually and unguided. In the phase of reading, we did not change anything, so there was no subjective influence. The reliability was provided with detailed instructions and specific questions. The reliability of the grading scales was checked with α-Cronbach's coefficient (α = 0.800). The results showed that the grading scales of the questionnaire are reliable sufficiently.
Data were processed with the SPSS statistics software. Analysis of individual statements is based on the means of the five-item agreement scale (1 - I disagree, 2 - I neither agree or disagree, 3 - I agree). Descriptive statistics (frequency distribution) and inference statistics (nonparametric statistical tests: Kruskal-Wallis (K-W) test, Mann-Whitney (M-W) U test, Wilcoxon (W) signed ranks test) were analyzed.

Results

Table 1. Numbers (f) and structural percentages (f %) in the degree of agreement with the statements related to the persons with SCI dealing with sport.

Statement	I disagree		I neither agree or disagree		I agree	
	N	f%	N	f%	N	f%
Before SCI, I dealt with sport more than after the injury.	56	44.8	24	19.2	45	36.0
After SCI, I deal with the same sports discipline.	91	72.8	18	14.4	16	12.8
Before SCI, I dealt with a recreational sport.	27	21.6	22	17.6	76	60.8
After SCI, I deal with a recreational sport.	38	30.4	22	17.6	65	52.0
Before SCI, I dealt with a competitive sport.	73	58.4	19	15.2	33	26.4
After SCI, I deal with a competitive sport.	50	40.0	18	14.4	57	45.6
I deal with sports activities together with my colleagues that also have disabilities.	31	24.8	11	8.8	83	66.4
I deal with sports activities together with my colleagues without any disability.	60	48.0	18	14.4	47	37.6

Table 1 shows that 36.0% of respondents dealt with sport more before SCI than after the injury. 72.8% of persons changed the sports discipline due to a SCI. Before SCI, more respondents dealt with the recreational sport (60.8%) than after the injury (52.0%). Less respondents (26.4%) dealt with the competitive sport before SCI than after the injury (45.6%). 66.4% of respondents deal with sports activities together with their colleagues that also have disabilities, however only 37.6% respondents deal with sports activities with their colleagues without any disability.

Table 2. The results of the Kruskal-Wallis (K-W) test of differences in dealing with sport before and after SCI.

Statement		Before SCI, I dealt with sport more than after the injury.		After SCI, I deal with the same sports discipline.	
The level of SCI	N	MR	K-W test	MR	K-W test
C1-C4	10	65.75	$\chi^2 = 14.132$ p = 0.015	51.15	$\chi^2 = 11.681$ p = 0.039
C5-C7	30	76.98		49.07	
T1-T5	18	48.50		50.31	
T6-T11	28	49.14		74.67	
T12-L3	26	54.90		59.54	
≥ L4	5	51.90		66.60	

The results of the Kruskal-Wallis test (table 2) show statistically significant differences in the more frequent involvement in sport before SCI than after SCI (p = 0.015). Mean ranks show that the persons with SCI at the cervical level (C1-C7) dealt with sport more before SCI than the persons with SCI at the thoracic and lumbar level do. The results of Kruskal-Wallis test do not indicate statistically significant differences in this according to the current age, the age when SCI occurred and the years of disability (p > 0.05). The results of Mann-Whitney U test do not indicate statistically significant differences in this according to the gender (p > 0.05). The results of Kruskal-Wallis test (table 2) show statistically significant differences in dealing with the same sports discipline before and after SCI (p = 0.039). Mean ranks show that the persons with SCI at higher levels of SCI changed their sports discipline after SCI than the persons with SCI at lower levels of SCI. The results of Kruskal-Wallis test do not indicate statistically significant differences in this according to the current age, the age when SCI occurred and the years of disability (p > 0.05). The results of Mann-Whitney U test do not indicate statistically significant differences in this according to the gender (p > 0.05). Sports disciplines that persons with SCI deal more after the injury than before it are basketball, diving, swimming, chess, shooting, sports fishing, table tennis, and to a lesser extent darts, sports dancing, and archery.

Table 3. The results of the Wilcoxon (W) signed ranks test of differences in dealing with recreational and competitive sport before and after SCI.

Ranks	N	MR	W test
Recreational sport after SCI < recreational sport before SCI	43	35.56	Z = -1.948 p = 0.051
Recreational sport after SCI > recreational sport before SCI	26	34.08	
Recreational sport after SCI = recreational sport before SCI	56		
Competitive sport after SCI < competitive sport before SCI	27	43.94	Z = -2.547 p = 0.011
Competitive sport after SCI > competitive sport before SCI	56	41.06	
Competitive sport after SCI = competitive sport before SCI	42		

The results of the Wilcoxon signed ranks test of differences in dealing with recreational sport before and after SCI (table 3) show statistically significant differences (p = 0.051). In our sample is the majority of persons who have dealt with recreational sport before and after SCI. Slightly fewer are the ones who have dealt with recreational sport less before SCI than after the injury. The minority of persons who have dealt with recreational sport more after SCI than before the injury.
The results of the Wilcoxon signed ranks test of differences in dealing with competitive sport before and after SCI (table 3) show statistically significant differences (p = 0.011). In our sample is the majority of persons who have dealt with competitive sport more after SCI than before the injury. Slightly fewer are the ones who have dealt with competitive sport before and after SCI. The minority of persons who have dealt with competitive sport more before SCI than after SCI.

Table 4. The results of the Kruskal-Wallis (K-W) test of differences in dealing with recreational and competitive sport after SCI according to the level of SCI.

Statement		**After SCI, I deal with a recreational sport.**		**After SCI, I deal with a competitive sport.**	
Level of SCI	N	**MR**	**K-W test**	**MR**	**K-W test**
C1-C4	10	19.60	$\chi^2 = 30.158$ p = 0.000	37.20	$\chi^2 = 13.822$ p = 0.017
C5-C7	30	46.78		53.37	
T1-T5	18	65.94		75.22	
T6-T11	28	77.41		53.61	
T12-L3	26	64.27		60.81	
≥ L4	5	47.70		86.10	

The results of the Kruskal-Wallis test (table 4) show statistically significant differences in dealing with recreational sport after SCI according to the level of SCI (p = 0.000). Mean ranks show that the most persons with SCI in the thoracic and lumbar level (T1-L3) deal with recreational sport and at least those persons with SCI at the cervical level (C1-C4). The results of Kruskal-Wallis test do not indicate statistically significant differences in this according to the current age, the age when SCI occurred and the years of disability (p > 0.05).
The results of Mann-Whitney U test do not indicate statistically significant differences in this according to the gender (p > 0.05).
The results of the Kruskal-Wallis test show (table 4) statistically significant differences in dealing with competitive sport after SCI according to the level of (p = 0.017). Mean ranks show that the most persons with SCI lower than L4, in the area from T1-T5, deal with competitive sport and at least those persons with SCI at the cervical level (C1-C4). The results of Kruskal-Wallis test do not indicate statistically significant differences in this according to the current age, the age when SCI occurred and the years of disability (p > 0.05).
The results of Mann-Whitney U test do not indicate statistically significant differences in this according to the gender (p > 0.05).

Table 5. The results of the Mann-Whitney U test of differences in dealing with recreational and competitive sport after SCI according to the gender.

Statement		**After SCI, I deal with a recreational sport.**		**After SCI, I deal with a competitive sport.**	
Gender	N	**MR**	**M-W U test**	**MR**	**M-W U test**
Male	83	65.10	U = 1568.5 p = 0.344	69.19	U = 1229.5 p = 0.006
Female	42	58.85		50.77	

The results of Mann-Whitney U test (table 5) do not indicate statistically significant differences in dealing with recreational sport after SCI according to the gender (p > 0.05). However, it indicates statistically significant differences in dealing with competitive sport after SCI according to the gender (p = 0.006). More men deal with competitive sport.

Table 6. The results of the Kruskal-Wallis (K-W) test of differences in dealing with sports activities together with persons with disabilities or persons without any disability.

Statement		**With sports activities I am dealing...**			
		...together with persons with disabilities.		**...together with persons without any disability.**	
Level of SCI	N	**MR**	**K-W test**	**MR**	**K-W test**
C1-C4	10	26.35	$\chi^2 = 17.288$	43.10	$\chi^2 = 4.653$

C5-C7	30	52.60	p = 0.004	58.65	p = 0.460
T1-T5	18	72.11		57.36	
T6-T11	28	68.46		64.98	
T12-L3	26	56.19		61.29	
≥ L4	5	67.40		43.00	

The results of the Kruskal-Wallis test (table 6) show statistically significant differences in dealing with sports activities with other persons with disabilities according to the level of SCI ($p = 0.004$). Mean ranks show that the persons with SCI at the thoracic region (T1-T11) deal with sport the most with other persons with disabilities and at least those persons with SCI at the cervical level (C1-C4). The results of the Kruskal-Wallis test do not indicate statistically significant differences in dealing with sports activities with other persons without any disability according to the level of SCI ($p > 0.05$).

The results of Kruskal-Wallis test (table 6) do not indicate statistically significant differences in dealing with sports activities together with persons with disabilities or persons without any disability according to the current age, the age when SCI occurred and the years of disability ($p > 0.05$).

The results of Mann-Whitney U test in dealing with sports activities with persons with disabilities or other persons without any disability also do not indicate statistically significant differences according to the gender ($p > 0.05$).

Dicussion

The purpose of the research was to determine the effects of spinal cord injury (SCI) on dealing with sport and the implementation of inclusion of adults with SCI in the field of sports in Slovenia. We were interested in differences regarding the level of SCI, current age, the age when SCI occurred, the years of disability and gender differences. Other researches show that the formation of the sporting identity of an individual is the most intensively influenced by the age when SCI occurred and the level of disability (Sherrill, & Williams, 1996). Likewise, the level of SCI, which is directly related to the level of disability, has been proven as a statistically significant factor in our research as well. The gender has proven to be a statistically significant factor only in dealing with sports at the recreational and competitive levels.

Other independent variables (current age, age when SCI occurred, years of disability) did not appear to be statistically significant in our research in contrast with other researches (Longmuir, 2000, Wu, & Williams, 2001). The results of our research indicate that the frequency of sports engagement increases after SCI, for example, recreational sport is reduced and the sports engagement at a competitive level is increased. This is not the case in other researches (Tasiemski, Bergström, Savic, & Gardner, 2000). We can assume that the results are mainly related to the big influence and great incentives by the Paralympic Committee of Slovenia - Sports Federation for the Disabled of Slovenia. They organize numerous sports practice and competitions in various sporting disciplines for persons with SCI (Fidler, 2016).

The persons with SCI at the cervical level deal with sport the least. We assume that the results are related to the functional capabilities of the individual and the lower autonomy possibilities of persons with SCI at the higher levels (Marincek, 1981; Sherill, & Williams, 1996), the poor accessibility to the sports facilities (Introductory report..., 2010), especially for persons with severe physical disabilities and furthermore, weak inclusion of children with physical disabilities in sports lessons (Filipcic, 2006; Krivonog 2013; Verhovnik, 2012; Stiftar, 2014) that has consequently also the effect on a lower level of social integration (Rimmer, Braddock, & Pitetti, 1996; Sherrill, & Williams, 1996).

The results of our research show that the same discipline of the sport was retained by 12.8% of persons after SCI. In reference to the level of SCI, we can anticipate possible functional capabilities and related sports that can be dealt with by persons with SCI (Winnick, 2005). Among sports disciplines that persons after SCI do not deal anymore are mainly those sports that persons with SCI are not possible to deal with. These are football, martial arts, handball, gymnastics, running. Some persons with SCI deal with sports activity occasionally (fitness and aerobics, parachuting). There are a lot of sports disciplines that were not organized during the research (volleyball, motorsport) in Slovenia and that is also the reason why this data was not analysed.

After SCI, 52.0% of persons deal with recreational sport. The most of them are the ones with SCI at the thoracic level and the least of them with SCI at the cervical, sacral and lumbar level. The results are most likely to be linked to the functional capabilities of an individual and the related (in)autonomy and (in)dependence of persons with SCI.

The life of the persons with lower levels of SCI (lumbar and sacral level) has not changed to such a large extent as of those with SCI at higher levels and for this reason dealing with sport has not essentially changed. These persons are more independent and more often employed compared to those with SCI at higher levels. Employment is the reason they have less free time, but at the same time, their employment already offers a certain measure of the social network that the individual needs (Eliott, Uswatte, Lewis, & Palmatier, 2000; Vornholt, Uitdewilligen, & Nijhuis, 2013). Retired persons with disabilities most often build this social network on the basis of sports activities (Hannon, 2005).

Analysis of the National Programme of Sport of the Republic of Slovenia 2000-2010 (Kolar, Jurak, & Kovac, 2010) showed that in recent years the process of inclusion of persons with disabilities into the sports federations is increasing. Our research has shown that persons with SCI mostly deal with sport with other persons with disabilities (66.4%) and, only to a lesser extent, with persons without disabilities (37.6%). Persons with SCI deal with sport together with other persons with disabilities the majority of persons with SCI at thoracic level but our research did not indicate statistically significant differences in dealing with sports activities with other persons without any disability according to the level of SCI.

Conclusions

Physical education and sports is a constituent of recreation, leisure, rehabilitation and social adaptation of persons with disabilities (Rudenko, Mahliovanyy, Shyyan, & Prystupa, 2015). The inclusion into sport of persons with SCI in Slovenia is difficult due to the poor accessibility to the sports facilities, although, things are gradually improving in the area of the suitability of construction and equipment of sports facilities. A higher level of inclusion into sports federations is also difficult because of the unsystematic training and improvement training of professional staff (Kolar, Jurak, & Kovac, 2010).

Regarding the current education system, the most appropriate solution for the fastest and most successful inclusion of children with physical disabilities in sports education is seen in the elimination of architectural obstacles at sports facilities and sports fields. Further solutions would be the additional training of sports pedagogues for persons with disabilities and a much greater role of special and rehabilitation pedagogues in the field of sport. In 2013, the Paralympic Committee of Slovenia - Sports Federation for the Disabled of Slovenia started training of instructors and teachers of sports for persons with disabilities. For this reason, it is anticipated that with the increased number of professional staff in the future, the percentage of inclusion of persons with disabilities into sports federations will increase (Fidler, 2016). The implementation of inclusion in the education system is directly related to the teacher's understanding of inclusion, his subjective theories, which fundamentally direct the interpretation of phenomena, situations and, above all, lead to certain expectations of individuals and groups (Rutar, 2012). Teachers' point of view towards inclusion is influenced by their expertise in working with children with disabilities (Cagran, & Schmidt, 2011).

A review of the education programs of future classroom teachers and sports pedagogues in Slovenia shows that classroom teachers gain some basic knowledge in the field of children with disabilities, but not specific knowledge related to sport. At the Faculty of Sport at the University of Ljubljana, where future sports pedagogues study, sports subjects for the persons with disabilities are only offered as optional subjects, and consequently, only a certain percentage of future sports pedagogues are acquainted with these contents. Specialized and rehabilitation pedagogues are still the best qualified for the children with disabilities in the field of sports (Fidler, 2016). Research shows that there are three types of personal beliefs for both future classroom teachers and future sports pedagogues in Slovenia: the inclusion of children and adolescents with movement barriers in sports education is a positive experience for peers without movement barriers, inclusion means a negative experience and problems for the teacher, and inclusion means negative experience for children with and without movement barriers (Kudlacek, Blankova, & Filipcic, 2007). It would be necessary to include a wide range of knowledge about children, adolescents and adults with disabilities as a compulsory subject in the education of future sports pedagogues. As long as these matters are not regulated at the system level, the education of sports pedagogues for teaching sports to the persons with disabilities will continue depending on their interest. These results suggest that in order to increase the inclusion of persons with physical disabilities in the field of sports in Slovenia, it is necessary to establish a systematic training system for all those involved in sport, from kindergarten teachers to teachers of classroom education, sports teachers, and trainers of various sports disciplines.

The greatest limitation of our research is attributed to the study of only those with SCI, which represent only one part of persons with physical disabilities. The average age of the respondents in the survey is high and a high percentage of participants is retired. It would, therefore, be sensible to extend the research to persons with other forms of physical disabilities and to the generation of young persons with physical disabilities. We assume that due to the poor professional competence of sports personnel, the inclusion of children with physical disabilities in the field of sports will remain at a low level, but for such claims, additional research will have to be done. The research would be more comprehensive if we would also gain the opinions of class teachers and sports pedagogues about the inclusion of persons with physical disabilities, as well as the opinions of faculty professors who educate professions related to sports.

Conflicts of interest:

Authors declare no conflict of interests.

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