

THE IMPACT OF ACTIVE PARTICIPATION IN SPORTS ON THE QUALITY OF LIFE IN INDIVIDUALS WITH INTELLECTUAL DISABILITIES: A PILOT STUDY

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Abstract: *The integration of individuals with intellectual disabilities in our country, as well as in the countries of the Western Balkans, remains slow and fragmented. In many cases, even the activities for which adequate resources and infrastructure exist are not utilized within integration efforts. One domain that has been empirically shown to positively influence both social inclusion and the general health of individuals with intellectual disabilities is sport. This paper aims to raise public awareness about the significance of sport, specifically swimming, on the psychophysical abilities of athletes with intellectual disabilities, in order to promote positive attitudes toward them and affirm inclusive values. The research was conducted on an initial sample of 10 swimmers (6 men and 4 women) with intellectual disabilities, aged 18 to 37 years. Data were collected on various physical health parameters (personal history, lung and heart function, pulse, blood pressure, ECG, height, weight, body mass index, spirometry, and vision), as well as information about the training process and competition results. Data were gathered at three different time points, allowing for longitudinal monitoring of changes in health indicators and athletic performance. The analysis showed that all physiological parameters in the participants were relatively stable and within acceptable ranges throughout the entire period. This stability was interpreted as a result of continuous swimming and its positive effect on physical health. In the final part of the paper, the athletes' sports achievements were analyzed, with a special focus on their potential impact on quality of life. The initial findings indicate that professional sports can significantly contribute to improving the quality of life of people with intellectual disabilities. These results open up opportunities for further research into psychophysical abilities and the development of positive public attitudes toward athletes with intellectual disabilities.*

Key words: *sport, swimming, intellectual disabilities, longitudinal monitoring*

Introduction

Individuals with intellectual disabilities (ID) face a range of difficulties after completing their education, primarily because their employment process is hampered and limited to sporadic examples, which hinders the quality of life for this vulnerable segment of the population. Bosnia and Herzegovina is a signatory to a number of

international documents that promote the rights and inclusion of persons with disabilities; however, research points to various barriers, a situation also seen in other Western Balkan countries [1,2,3,4,5]. In addition to unemployment, the quality of life of adults with ID is also affected by the fact that they spend most of their time within a narrow circle of family and friends without the opportunity to integrate and gain new experiences in the community. Some individuals with intellectual disabilities are active in associations that offer various project activities for people with ID and are located in larger cities, while individuals from smaller towns and villages are largely excluded. Simultaneously, some of these associations provide support for adults with ID through the application of various sports activities, which positively affects the quality of life of these individuals.

The quality of life defined by the World Health Organization takes into account: "broad ranging concept incorporating in a complex way the person's physical health, psychological state, level of independence, social relationships, personal beliefs and their relationships to salient features of the environment." [6] Sports activities can positively influence the aforementioned factors in individuals with ID. Quality of life, sport, sports organizations, and swimming are concepts explained in the International Classification of Functioning, Disability and Health (ICF) under the components: Activities and Participation and Environmental Factors [7]. Promoting these components provides a starting framework for affirming sports activities in the daily lives of individuals with ID in our country. However, sports activities are still not sufficiently represented in all phases of life for individuals with ID, and the public is insufficiently informed about the issues this population faces. A brief chronological overview provides insight into facts that point to shortcomings regarding the implementation of sports activities, training, and swimming instruction. Preschool education in Bosnia and Herzegovina is not compulsory, and there is no record of the sports skills children with ID acquire at an early age. During primary and secondary school attendance under the curriculum for children with ID, physical activities take place within a scope of 3 to 5 classes per week. The original name of the subject, *Development of Psychomotor Skills and Physical Education*, is changed to *Physical and Health Education* in the new curriculum. In this curriculum, swimming is not included throughout the entire nine-year period of primary education. Following this, the program for students with moderate and severe intellectual functioning involves a final three-year educational unit, where swimming instruction is not foreseen [8]. This indicates insufficient participation of individuals with ID in sports activities during their schooling, which is also reflected in later life. Acquisition of swimming skills is left to the family, primarily the parents. They enroll their children, and later adults with ID, in swimming training at a sports association only if one exists in the community where they live. Reduced participation of individuals with ID in swimming activities has been identified in other environments and cultures as well. In this sport, a slightly higher participation rate has been recorded among individuals with Down syndrome [9]. There is a need to promote water-based exercise for individuals with ID because it contributes to their physical health; however, the impact on motor skills, cognitive function, and mental health has not been sufficiently researched [10, 11]. Research analyzing the impact of sports on the social inclusion

of individuals with ID shows varying attitudes among respondents. Smith et al. state that sports activities in which individuals with ID participate do not automatically improve community participation, belonging, or self-esteem for all young people with ID [12]. It has been identified that group swimming sessions encourage social interaction in this population [13]. Studies with a control group involving individuals with Down syndrome show a healthier body composition and a higher physical fitness score than untrained individuals [14]. Individuals with ID have different clinical profiles, and specific characteristics follow each individual in this population, which is necessary to consider when analyzing the impact of sports and training like swimming.

Considering the importance of acquiring swimming technique as well as continuous training, the local Special Sport Club Banja Luka (SSC "*Aktiviraj se*") has been conducting long-term training for adults with ID. These activities include regular medical examinations, anthropometric measurements, and the collection of other important data related to the health of every individual with ID involved in the training. Simultaneously, records are kept of participation and achievements in swimming competitions, which we will present in this paper. Our goal is to bring the importance of sport, specifically swimming, to the general public, primarily focusing on the psychophysical abilities of athletes with intellectual disabilities, in order to create a positive attitude towards them and affirm inclusive values in our society. Affirming the achievements of individuals with ID is important for their family members and for the entire community, as it is an opportunity to draw attention to members of this population who do not have the opportunity to participate in sports activities or to independently advocate for an improved quality of life.

Material and methods

This pilot study was conducted to observe two aspects of adults with ID who are involved in swimming training. The first aspect represents the longitudinal monitoring of health indicators, which included medical history records (anamnesis) and anthropometric measurements. The second aspect demonstrates how important participation and achievements in competitions are for the quality of life, building positive attitudes toward this population, and their social inclusion. The data for this research analyzes anthropometric measurements at three time points, which enabled the longitudinal tracking of changes in health indicators as well as competitive achievements over more than a decade of training. Swimming competition achievements spanning the period from 2018 to 2024 were also analyzed. Data processing was performed using descriptive and comparative statistics procedures.

This pilot study was conducted on a small sample of members of the Special Sport Club Banja Luka. The sample consists of 10 swimmers, seven male and three female, who are involved in swimming training twice a week, utilizing the resources of the City's Olympic Swimming Pool Banja Luka. Of the total number of subjects, eight have moderate intellectual disability (mental retardation) and two have mild intellectual disability (mental retardation). Six of the subjects have Down syndrome (three male and three female), and one male subject has Marfan syndrome and diagnosed epilepsy. The participants range in age from 18 to 37 years old. The

competitions in which they participated are: *Oasis Sports Games (SIO)* and *Special Olympics*.

Results and discussion

The results of the anthropometric measurements for individuals with ID, which include body composition in relation to the BMI value, are provided in Table 1.

Table 1. Descriptive characteristics anthropometric measures of swimmers with ID

	Variables	Males (n=7) M±SD	Females (n=3) M±SD	Total (n=10) M±SD
1 st	Years of training	1.61±1.58	1.40±1.44	1.55±1.46
	TV/cm	166.71±17.36	144.67±5.86	160.10±17.94
	TT/KG	56.14±13.92	59.33±4.93	57.10±11.70
	BMI	19.89±1.79	26.70±2.66	21.93±3.81
	Pulse	67.71±9.71	62.33±2.52	66.10±8.45
2 nd	Years of training	4.86±2.67	5.33±1.53	5.00±2.31
	TV/cm	171.07±12.52	146.00±3.61	163.55±15.94
	TT/KG	65.14±13.23	60.67±2.08	63.80±11.06
	BMI	22.27±3.96	28.60±2.31	24.17±4.58
	Pulse	69.14±7.43	58.0±8.89	65.80±9.13
3 rd	Years of training	10.20±2.17	10.50±2.12	10.29±1.98
	TV/cm	170.40±10.62	145.50±4.95	163.29±15.06
	TT/KG	67.00±14.68	62.00±5.66	65.57±12.45
	BMI	23.36±5.93	29.50±4.81	25.11±6.02
	Pulse	68.80±8.32	58.50±2.12	65.86±8.49

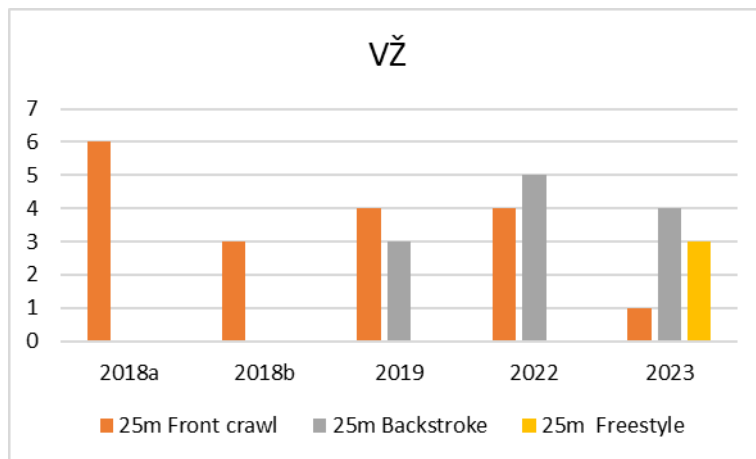
The results in Table 1 show that the female participants were overweight according to the BMI value in all three measurement periods, while the values for the male athletes were within normal limits. It is evident that the BMI values increased among the subjects from the first to the third measurement. However, a comparison of the BMI in the first (M=21.93) and second measurement (M=24.17) showed that the registered differences were not statistically significant, meaning there was no significant change in the subjects' BMI ($t(9)=-1.845$; $p=.098$). The same finding was obtained when measuring the differences between the second (M=24.17) and third measurement (M=25.11). In this case too, the difference obtained via the t-test did not reach statistical significance at any level ($t(6)=-1.330$; $p=.232$). It should be noted here that the t-test was calculated for the total sample of subjects only, without separating men and women. In addition, it is important to state that the third measurement included a total of 7 subjects (2 women and 5 men). Due to the specificity of the clinical profile of individuals with ID who have Down syndrome and Marfan syndrome, the data obtained from measurements such as BMI should be taken with caution [14]. Finally,

Table 1 also shows the pulse values for the subjects across all three measurements. A comparison of the arithmetic means of the subjects' pulse at the first ($M=66.10$) and second measurement ($M=65.80$) showed that the observed differences were not statistically significant, indicating the absence of a relevant change in pulse values ($t(9)=0.099$; $p=.923$). A similar finding was obtained when comparing the results of the second ($M=65.80$) and third measurement ($M=65.86$). In this case, the difference also did not reach the level of statistical significance according to the t-test ($t(6)=1.951$; $p=.083$).

An insight into the medical documentation shows that the athletes with ID have various (multiple) associated disorders in addition to their primary diagnoses. Four athletes have been diagnosed with different cardiac defects that are under the control of a cardiologist (Mitral valve prolapse, Bradycardia). Also, four individuals wear corrective lenses. Scoliosis was diagnosed in six individuals and kyphosis in two individuals. There are no indications of lung disease among the athletes with ID.

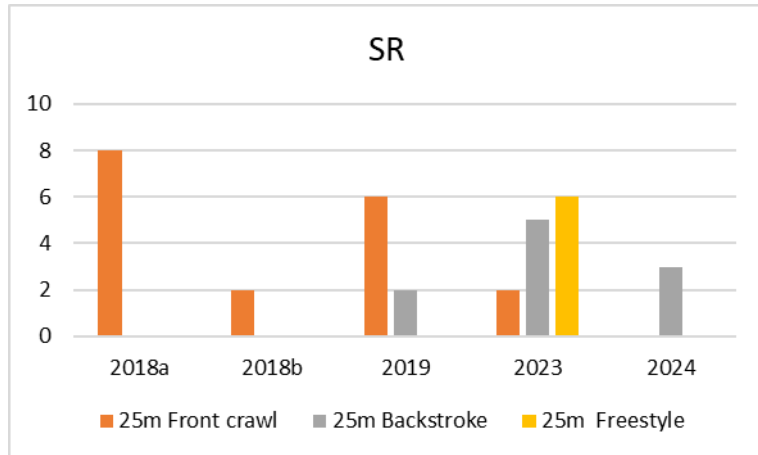
Sports achievements show that, out of a total of 48 measurements of individual successes in swimming competitions, the subjects won 27 medals (4 gold, 9 silver, and 14 bronze) based on their results, while in 21 cases they placed between 4th and 8th.

The following charts show the most significant individual swimming results achieved in competitions by the athletes in this sample. The first three charts represent the female individuals with ID who have Down syndrome.



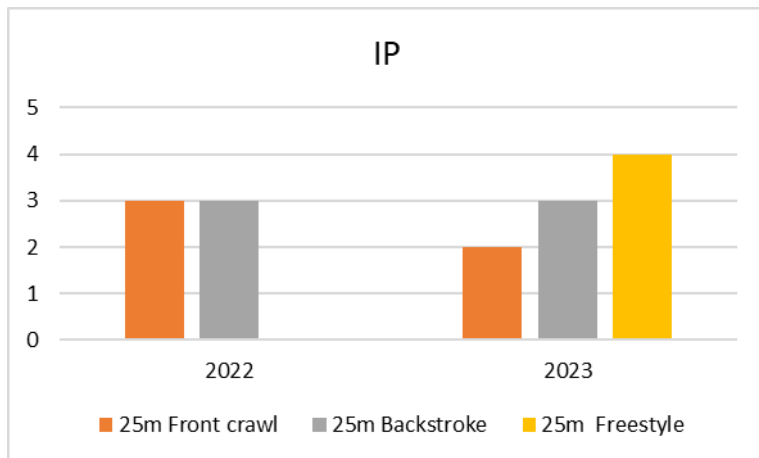
Graph 1. Results in the Category of Women with ID and Down Sy.

Over the years of training, Graph 1 shows that the female athlete with DS won 1 gold (front crawl) and 3 bronze medals (front crawl, backstroke, and freestyle). Research states that progress in learning swimming is acquired by persons with Down syndrome in small steps and requires a great deal of empathy from the coach [15]. It is evident here that the woman with DS had continuity in training and competition, perfected various swimming techniques, and managed to achieve excellent results.



Graph 2. Results in the Category of Women with ID and Down Sy.

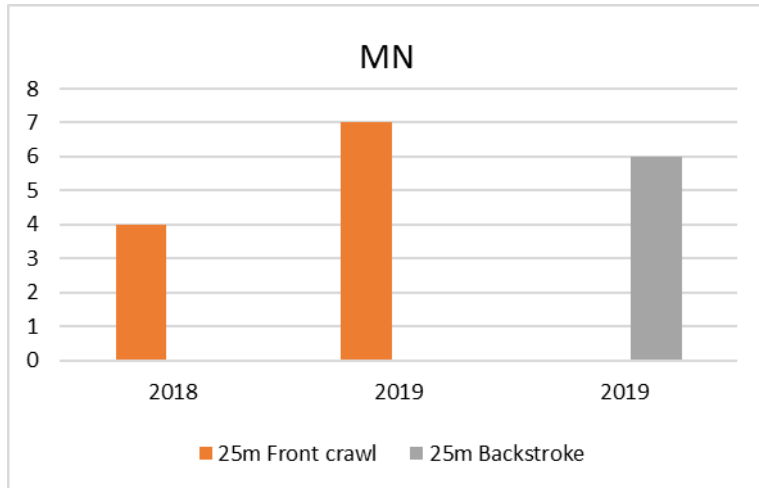
Graph 2 shows that, through continuous competition, the female athlete with DS perfected the front crawl, backstroke, and freestyle, achieving notable competitive successes over time.



Graph 3. Results in the Category of Women with ID and Down Sy.

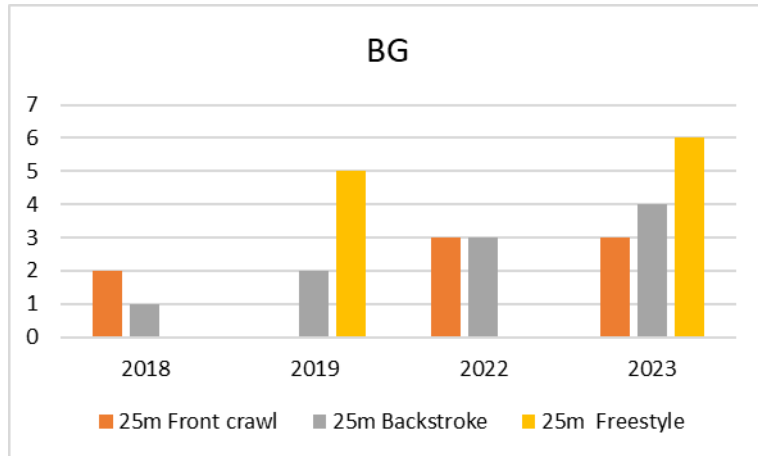
The different swimming styles shown in Graph 3 indicate the high placement of the female athlete with DS in competitions during 2022 and 2023, where she won 1 silver (front crawl) and 3 bronze medals (1 front crawl and 2 backstroke).

Of the seven male athletes with ID, two did not place in competitions. One athlete with DS participated in a competition in 2018 and won 1 silver (backstroke) and 1 bronze medal (butterfly). Another male athlete with ID placed fourth in 2023 (front crawl) and won one bronze medal the following year in 2024 (backstroke). Three male competitors achieved placements that are shown in the following charts.



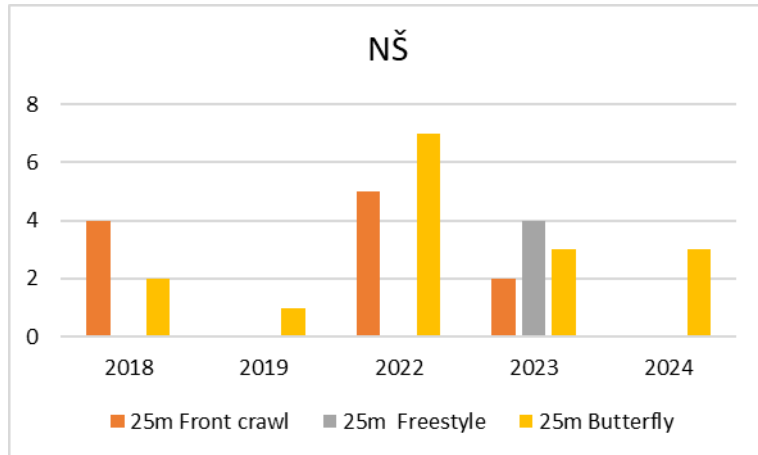
Graph 4. Results in the Category of Men with Down Sy.

An example of the challenges faced by athletes with special needs can be seen with one of the athletes with DS (Graph 4), who achieved solid overall results in his sports career: one 4th place and one 7th place (front crawl) and one 6th place (backstroke). Namely, this athlete started practicing horseback riding instead of swimming because he was diagnosed with a heart defect (Mitral valve prolapse) that requires moderate sports activities. The experience of swimming training and good placement influenced his social inclusion and led him to find a way to actively engage in another sport.



Graph 5. Results in the Category of Men with Down Sy.

Graph 5 shows that the man with DS achieved 9 placements, including 1 first place (backstroke), 2 second places (backstroke and front crawl), and 3 third places (1 backstroke and 2 front crawl). These sports successes are also significant for the family, which has actively supported this young athlete with DS throughout all the years of his training.



Graph 6. Results in the Category of Men with Down ID

A male individual with ID achieved 9 placements, including 1 first place, 2 second places, and 2 third places, which represents solid continuity. Graph 6 shows significant successes in the butterfly style, where one first place, one second place, and two third places are evident. High placements were consistently achieved, except for the competition year immediately following the COVID-19 pandemic. It is possible that the break from training influenced that result.

Conclusion

In this paper, we primarily observed the quality of life of individuals with ID by analyzing their anthropometric measurements, health indicators, and competitive achievements. Swimming training and the results achieved in competitions were described with the intention of demonstrating a positive effect on the quality of life of athletes with ID.

Given the presence of health issues faced by individuals with ID and the limitations on their well-being, participation in training sessions and competitions is an excellent example of improving their health and quality of life. The family and the environment have the opportunity to encourage and monitor their successes, which contributes to strengthening family ties and better emotional and social relationships. The affirmation of sport, especially swimming for individuals with ID, contributes to raising a positive image in society and promoting inclusive values. All the athletes in this pilot study live in the city and suburban settlements, which provides them with the opportunity to engage in sports and raises their quality of life, unlike those living in rural areas.

This pilot study demonstrated the need for deeper research into the psychophysical abilities of individuals with ID as well as their quality of life. Further research should encompass the psychophysical abilities of individuals with ID with a special emphasis on the prevention of obesity, postural correction, and the regulation of behavior and mood.

The limitations of this study are the lack of a control group as well as the small number of subjects.

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UTICAJ AKTIVNOG BAVLJENJA SPORTOM NA KVALITET ŽIVOTA OSOBA SA INTELEKTUALNIM SMETNJAMA: PILOT STUDIJA

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Sažetak: *Integracija osoba sa intelektualnim smetnjama kod nas, kao i u zemljama Zapadnog Balkana odvija se sporo i fragmentarno. Često ni aktivnosti za koje već postoje adekvatni resursi i infrastruktura nemaju primjenu u integracionim procesima. Jedna od oblasti za koju je empirijski dokazano da pozitivno utiče na socijalnu inkluziju, kao i na opšte zdravlje osoba sa intelektualnim smetnjama, jeste sport. Cilj ovog rada je da široj javnosti približi važnost sporta, konkretno plivanja, prevashodno na psihofizičke sposobnosti sportista sa intelektualnim smetnjama radi stvaranja pozitivnog stava o njima i afirmisanja inkluzivnih vrijednosti. Istraživanje je sprovedeno na malom inicijalnom uzorku od 10 plivača (6 muškaraca i 4 žene) sa intelektualnim smetnjama, uzrasta od 18 do 37 godina. Prikupljeni su podaci iz oblasti fizičkog zdravlja (lična anamneza, nalaz pluća, srca, puls, krvni pritisak, EKG, visina, težina, indeks tjelesne mase, spirometrija, nalaz vida), kao i informacije o trenaznom procesu i takmičarskim rezultatima. Podaci su prikupljeni u tri vremenske tačke, što je omogućilo longitudinalno praćenje promjena u zdravstvenim indikatorima i sportskim dostignućima. Analiza je pokazala da su svi fiziološki parametri kod ispitanika bili relativno stabilni i u granicama prihvatljivih vrijednosti tokom cijelog perioda. Ova stabilnost je protumačena kao rezultat kontinuiranog bavljenja plivanjem i njegovog pozitivnog uticaja na fizičko zdravlje. U završnom dijelu rada analizirana su sportska postignuća ispitanika, sa posebnim osvrtom na potencijalni uticaj tih dostignuća na kvalitet njihovog života. Prvi nalazi ukazuju na to da profesionalno bavljenje sportom može imati značajan doprinos unapređenju kvaliteta života osoba sa intelektualnim smetnjama. To nam otvara mogućnosti za dublja istraživanja psihofizičkih sposobnosti kao i pozitivnih stavova prema sportistima sa intelektualnim smetnjama.*

Ključne riječi: *sport, plivanje, intelektualne smetnje, longitudinalno praćenje*