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Increasing Exercise Awareness in Individuals with Intellectual Disabilities Among Sports Science Students: An Educational Application

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A B S T R A C T

Objective: The primary aim of this research is to examine the awareness levels of students studying at the Faculty of Sports Sciences regarding the importance of exercise for individuals with intellectual disabilities and to contribute to developing this awareness. Considering the physical, psychological, and social benefits of exercise programmes for individuals with intellectual disabilities, increasing this awareness is crucial both for developing students' professional knowledge and skills and for contributing to the quality of life of individuals with intellectual disabilities.

Methods: The 'Attitude Scale Towards Sports Activities of Individuals with Intellectual Disabilities' developed by İlhan and Esentürk (2015) was administered to 68 participants studying at the Faculty of Sports Sciences in order to collect pre-test data. In the next stage, participants underwent a 120-minute training programme covering the definitions of mental disability, the characteristics of individuals with mental disabilities, and the benefits of exercise. Participants who completed the training were paired one-on-one with individuals with intellectual disabilities and underwent a 240-minute exercise programme, which was carried out over 2 days, 120 minutes per day. After the exercise programme was completed, the same attitude scale was re-administered to the participants to collect final test data. The data obtained were transferred to IBM SPSS 26 software for analysis. When evaluating the study data, the Shapiro-Wilk and Kolmogorov-Smirnov tests were used to check the normality of the numerical measurements, and the dependent samples t-test was used to examine changes over time.

Findings: The results of the study revealed a statistically significant increase in the participants' pre-test and post-test mean scores on the attitude scale and sub-dimension scores regarding the sporting activities of individuals with intellectual disabilities over time.

Conclusion: The research is significant in terms of contributing to the development of positive attitudes towards individuals with intellectual disabilities by future sports educators and the training of more conscious and equipped sports scientists in this field.

Keywords: *Intellectual Disability, Exercise, University*

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1. Introduction

Disability is a complex condition that affects individuals' daily activities and participation in society, directly impacting their quality of life. Information on global disability rates varies depending on the source. The World Health Organisation stated in 2011 that 15 per cent of the global population lived with various types of disability and that this rate continued to increase (1).

The participation of people with intellectual disabilities in physical and sporting activities is extremely important for the development of physical health, psychological well-being and social skills. In addition to all this, regular exercise activities improve the cardiovascular endurance, muscle strength, flexibility and motor skills of individuals with intellectual disabilities, while also increasing their self-confidence, self-esteem and level of social interaction (2).

Research shows that continuous physical activity helps prevent secondary health problems such as hypertension and diabetes in individuals with intellectual disabilities and has beneficial effects on motor development. In addition, regular exercise has positive effects on cognitive functions. Numerous studies support the notion that aerobic exercise enhances attention and memory performance (3).

Mindfulness can be defined as focusing attention on the present moment and accepting and embracing the moment as it is, independent of past events or feelings and thoughts expected to occur in the future (4).

Humans are social beings and live together in communities. Society is not homogeneous due to the influence of diversity. Disability awareness is combined with the cultural characteristics of the community. In developed societies, the inclusion of disability issues in the education system increases individuals' sensitivity. The education, health services and employment opportunities provided to people with disabilities facilitate their participation in social life. In developing societies, however, health problems, inadequate services, and legal shortcomings make it difficult for disabled individuals to participate in social life (5).

Undoubtedly, sport has an active place in the range of opportunities offered to disabled individuals. Sport is a biological, pedagogical and social phenomenon that improves the individual's physical and psychological health, regulates their social behaviour, and brings their mental and motor skills to a certain level. Therefore, sport should be considered as a tool in the process of achieving the social integration of individuals with disabilities (6).

Particularly in the final stages of the educational process, such as at universities, students who have reached a certain level of maturity are expected to adopt a more attentive and unbiased approach. However, individuals with disabilities face problems arising not only from deficiencies in their environment but also from the attitudes and behaviours of other people (7).

Awareness: is the act of a person using their senses to comprehend their environment, as well as being knowledgeable about necessary topics, focusing on a situation that needs to be understood, or showing sensitivity (8).

The benefits of exercise programmes for disabled individuals are increasingly supported by ongoing research. This study also aims to provide university students with an opportunity to gain awareness of these benefits, enabling them to undergo a conscious period of study before starting their professional lives and to develop themselves in this area.

2. Methods and Materials

2.1 Design

This research employed a single-group pre-test-post-test quasi-experimental design based on quantitative research methods. The aim of the study was to examine changes in awareness and attitudes regarding the importance of exercise for individuals with intellectual disabilities among students enrolled in the Faculty of Sports Sciences.

This model involves measurements taken on the same group to evaluate the effect of an intervention (educational programme and applied exercise process). At the beginning of the study, an attitude scale was administered to the participants, and after the completion of the research process, the same scale was re-administered to analyse the difference.

2.2 Participants

The participants in the study were volunteer students studying at the Faculty of Sports Sciences of a state university. The convenience sampling method was used in the selection of participants. The criteria considered in the selection of participants were:

1. Their willingness to participate in the study on a voluntary basis,
2. Their lack of experience working with individuals with intellectual disabilities,

3. Committing to participate fully in the entire training and application process.

Prior to commencing the research, an approval certificate was obtained from the Bartın University Social and Human Sciences Ethics Committee at the meeting dated 08.01.2025 and numbered 2024-SBB-1072.

2.3 Data Collection Tool

The 'Attitude Scale Towards Sports Activities of Individuals with Intellectual Disabilities' developed by İlhan and Esentürk (2015), which is openly accessible, was used to collect data in the study (9). The scale is based on a 5-point Likert-type rating system and consists of a total of 21 items and 4 sub-dimensions:

1. Physical Competence,
2. Psycho-Social Development,
3. Attitudes Towards People with Disabilities,
4. Exercise Opportunities.

The Cronbach Alpha internal consistency coefficient of the scale was determined to be 0.85, making it a reliable and valid tool.

2.4 Data Analysis

The study was conducted on 68 participants. The data were transferred to IBM SPSS Statistics 26 software for analysis. When evaluating the study data, the Shapiro Wilk and Kolmogorov Smirnov tests were used to check the normality of the numerical measurements. For parameters that were not suitable, the arithmetic mean, mode, and median were found to be equal or close, skewness and kurtosis coefficients close to 0 within ±1 limits, and skewness and kurtosis indices close to 0 within ±1.96 limits, calculated by dividing skewness and kurtosis coefficients by their own standard errors. Thus, the suitability of normal distribution was considered as evidence, and parametric tests were used. (10-14). Frequency distributions (number, percentage) were provided for categorical variables, and descriptive statistics (mean, standard deviation) were provided for numerical variables. The dependent samples t-test was used to examine changes over time. One of the most frequently used criteria in assessing scale reliability is Cronbach's alpha, a measure of internal consistency. Calculations were performed for the scales, and Cronbach's alpha value was calculated as 0.899 for the pre-test and 0.844 for the post-test of the scale measuring attitudes towards sporting activities of individuals with intellectual disabilities. These values are higher than the generally acceptable value of 0.700 (15). Additionally, Cohen's d value was provided for effect size, and $p<0.05$ was accepted for significance.

The power analysis conducted using the GPower 3.1.9.7 programme revealed that the power level for detecting changes over time in the attitude scale towards sporting activities among individuals with intellectual disabilities was 0.997, with a Type I error of 0.05, an effect size of 0.577, and n = 68 individuals.

3. Results

92.6% of participants were aged 19-25, 50% were female, 38.2% were sports management students, 23.5% were physical education and sports teaching students, 22.1% were recreation students, 16.2% were coaching students, and 67.6% were in Year 3.

Table 1. Analysis of demographic information (n=68)

		n	%
Age	Under 18	3	4.4
	19-25	63	92.6
	Over 25	2	2.9
Gender	Female	34	50.0
	Male	34	50.0
Department	Coaching education	11	16.2
	Physical education and sports teaching	16	23.5
	Recreation	15	22.1
	Sports management	26	38.2
Class	1st grade	8	11.8
	Year 2	8	11.8
	3rd grade	46	67.6
	4th grade	6	8.8

A statistically significant increase was observed in the scale and subscale scores of attitudes towards sports activities among individuals with intellectual disabilities over time ($p < 0.05$).

Table 2. Examination of changes over time in scale and subscale scores regarding attitudes towards sports activities for individuals with intellectual disabilities (n=68)

	mean	ss	t	p	Cohen's d (95% CI)
Positive attitude towards sporting activities (pre-test)	87.65	9.99	-4.477	0.000*	0.502 (0.122–0.805)
Positive attitude towards sporting activities (final test)	93.51	8.35			
Negative attitude towards sporting activities (pre-test)	27.34	7.31	-3.205	0.002*	0.345 (0.025–0.703)
Negative attitude towards sporting activities (final test)	30.03	5.26			
Attitude scale towards sporting activities of individuals with intellectual disabilities (pre-test)	114.99	14.55	-5.134	0.000*	0.577 (0.267–0.953)
Attitude scale towards sports activities for individuals with intellectual disabilities (final test)	123.54	12.13			

t: Dependent samples t-test*: $p < 0.05$

A statistically significant increase was observed in the attitude scale and subscale scores regarding the sporting activities of individuals with intellectual disabilities over time among both women and men ($p < 0.05$).

A statistically significant increase was observed in the attitude scale towards the sporting activities of individuals with intellectual disabilities over time and in the sub-dimension scores of negative attitudes towards sporting activities among students in the coaching department, while a statistically significant increase was observed in the attitude scale towards the sporting activities of individuals with intellectual disabilities over time and in the sub-dimension scores of positive attitudes towards sporting activities among students in physical education and sports teaching and sports management. ($p < 0.05$), no statistically significant change was found in the attitude scale and sub-dimension scores towards the sporting activities of individuals with intellectual disabilities over time among recreation students ($p < 0.05$).

A statistically significant increase was found in the sub-dimension scores of negative attitudes towards sporting activities over time among 1st/2nd grade students, and in the attitude scale and sub-dimension scores towards the sporting activities of individuals with intellectual disabilities over time among 3rd/4th grade students ($p < 0.05$).

Table 3. Examination of changes over time in scale and subscale scores regarding attitudes towards sporting activities among individuals with intellectual disabilities (n=68)

		Pre-test mean±SD	Post-test mean±SD	t	p	Cohen's d (95% CI)
Gender						
Female	Positive attitude towards sporting activities	89.82±9.63	94.38±8.99	-2.307	0.027*	0.383 (-0.159-0.800)
	Negative attitude towards sporting activities	28.44±7.10	30.76±4.86	-2.455	0.020	0.380 (0.009–0.969)
	Attitude scale towards sports activities for individuals with intellectual disabilities	118.26±14.82	125.15±12.82	-2.897	0.007*	0.468 (0.019–0.982)
Male	Positive attitude towards sporting activities	85.47±10.00	92.65±7.68	-4.166	0.000*	0.644 (0.153–1.128)
	Negative attitude towards sporting activities	26.24±7.45	29.29±5.60	-2.185	0.036	0.333 (-0.175-0.782)
	Attitude scale towards sports activities for individuals with intellectual disabilities	111.71±13.70	121.94±11.37	-4.375	0.000*	0.693 (0.207–1.186)
Section						
Coaching education	Positive attitude towards sporting activities	85.91±12.37	89.91±9.14	-1.015	0.334	0.271 (-0.583-1.096)
	Negative attitude towards sporting activities	22.64±7.65	29.36±5.73	-4.534	0.001*	1.281

						(1.071–2.906)
	Attitude scale towards sports activities for individuals with intellectual disabilities	108.55±16.39	119.27±13.33	-2.291	0.045*	0.635 (-0.187-1.526)
Physical education and sports teaching	Positive attitude towards sporting activities	86.56±9.35	96.25±6.12	-3.482	0.003*	0.736 (-0.098-1.335)
	Negative attitude towards sporting activities	26.63±8.00	30.88±5.32	-1.668	0.116	0.352 (-0.422-0.974)
	Attitude scale towards sports activities for individuals with intellectual disabilities	113.19±14.06	127.13±9.68	-3.638	0.002*	0.788 (0.004–1.442)
Recreation	Positive attitude towards sporting activities	85.27±11.53	90.20±10.68	-1.755	0.101	0.437 (-0.261-1.187)
	Negative attitude towards sporting activities	26.07±8.34	27.47±6.10	-1.279	0.222	0.333 (-0.065-1.376)
	Attitude scale towards sports activities for individuals with intellectual disabilities	111.33±17.32	117.67±15.34	-2.080	0.056	0.514 (0.027–1.482)
Sports management	Positive attitude towards sporting events	90.42±8.11	95.27±6.83	-2.583	0.016*	0.470 (-0.153-0.949)
	Negative attitude towards sporting activities	30.50±4.58	31.27±4.11	-0.685	0.500	0.128 (-0.442-0.646)
	Attitude scale towards sports activities for individuals with intellectual disabilities	120.92±10.40	126.54±9.44	-2.273	0.032*	0.426 (-0.198–0.901)
Grade						
1st/2nd grade	Positive attitude towards sporting activities	88.69±11.03	92.00±9.06	-1.044	0.313	0.239 (-0.487-0.904)
	Negative attitude towards sporting activities	25.44±7.99	30.38±5.04	-2.499	0.025*	0.535 (-0.164-1.247)
	Attitude scale towards sports activities for individuals with intellectual disabilities	114.13±16.05	122.38±13.33	-1.838	0.086	0.424 (-0.322–1.079)
3rd/4th grade	Positive attitude towards sporting activities	87.33±9.74	93.98±8.15	-4.718	0.000*	0.605 (0.186–0.973)
	Negative attitude towards sporting activities	27.92±7.07	29.92±5.36	-2.211	0.032*	0.277 (-0.086-0.686)
	Attitude scale towards sports activities for individuals with intellectual disabilities	115.25±14.21	123.9±11.86	-5.037	0.000*	0.650 (0.351–1.140)

t: Paired samples t-test*: $p < 0.05$

4. Discussion and Conclusion

This study revealed that the theoretical education and practical exercise intervention provided to students of the Faculty of Sports Sciences led to significant improvements in attitudes towards sporting activities among individuals with intellectual disabilities. Pre-test–post-test comparisons revealed significant increases in both positive and negative attitude sub-dimensions; furthermore, significant differences were identified in terms of department, class, and gender variables. The findings show essential similarities and some unique discrepancies when compared with the relevant literature.

Firstly, the significant increase in students' awareness and attitudes observed as a result of this study is consistent with previous research. Various studies using the scale developed by İlhan and Esentürk (2015) have also shown that sports science students' positive attitudes towards individuals with disabilities develop through education and experience (9). Indeed, Baykan, Naçar, Şenol, and Çetinkaya (2018) reported in their study conducted among academics that disability awareness is strengthened through education and information processes (5).

The model applied in this research was not limited to the transfer of theoretical knowledge but also included a practical exercise process. Similarly, Bishop and colleagues' (2004) definition of awareness emphasises that it is not only the acquisition of knowledge at a cognitive level but also the direct experience of 'living in the moment' and restructuring one's perceptions that is critical in increasing awareness (4). Therefore, the findings of this study support the role of direct contact in reducing prejudice and developing positive attitudes, as predicted by contact theory (16).

The results obtained in the subgroup analyses are also consistent with the literature. Sağlam and Altındağ (2017) noted that university students' awareness of people with disabilities developed through education, while gender differences could vary depending on the context (7). The fact

that significant developments were found in both female and male students in this study, but the effect size was higher in males, points to this contextual variability. Furthermore, the observation of a higher increase in awareness in upper classes is consistent with previous findings showing that student experience and maturity shape attitudes (6).

Similarities were also observed in terms of departmental differences. A significant increase was observed in physical education and sports teaching and sports management departments, while no significant change was detected in the recreation department. This is consistent with findings in the literature reporting that physical education and teacher candidates exhibit higher awareness and positive attitudes due to their more frequent exposure to disability-related courses and practices (17).

One of the noteworthy original findings of this study is the significant increase observed in the 'negative attitude' sub-dimension. In many studies, the negative attitude sub-dimension either remains unchanged or shows a lower level of change (17). This difference suggests that the applied exercise component has a strong effect in breaking down negative perceptions.

Another difference is that the study is based on direct exercise application. Much of the literature is limited to interventions based solely on attitude measurements or information transfer (5)(15). In this respect, the study is one of a limited number of studies that emphasise the importance of experiential learning and one-to-one interaction.

Furthermore, long-term effects were not measured in this study. However, the literature reports that while information and contact-based interventions have positive short-term effects, these effects may diminish over the long term (18). Therefore, future studies should include long-term follow-up measurements.

The results of the research are consistent with contact theory (16) and experiential learning theories. During the education process, students acquired knowledge and experienced direct interaction with individuals with intellectual disabilities, which fostered empathy development and reduced prejudice. In this context, the applied exercise process created transformation not only in cognitive but also in emotional and behavioural dimensions.

Class and department differences are directly related to the content of the curriculum. In particular, the higher rate of positive change in the teaching and management departments indicates that these programs' pedagogical and social content is more conducive to developing students' awareness. The lack of a significant increase in the recreation department may be due to the course content being more individual and entertainment-oriented.

Gender findings indicate the influence of social roles. While the literature indicates that female students demonstrate higher levels of empathy and sensitivity (7), this study also observed strong development in males. This situation demonstrates that the intervention is effective for both genders.

These findings offer various recommendations for increasing the inclusivity of sports science education:

1. Practical contact and experience-based activities should be included in curricula alongside theoretical courses.
2. Inclusive educational content should be strengthened, particularly in sections such as recreation.
3. Long-term follow-up studies should be conducted to assess the sustainability of attitude changes.
4. Students should be encouraged to establish regular contact with disabled individuals through voluntary projects, fieldwork, and internships.

Overall, the findings of this study reveal that disability awareness can be developed more effectively through applied experience alongside knowledge transfer. Alongside results consistent with the literature, the significant increase observed in the negative attitude sub-dimension constitutes the original contribution of this study. In this context, supporting sports science education with inclusive practices will both enhance students' professional skills and strengthen the social participation of individuals with intellectual disabilities.

Authors' Contributions

All authors equally contributed to this study.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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