

# **BENEFITS OF PRACTICING JUDO IN A POPULATION WITH INTELLECTUAL DISABILITIES. DIFFERENCES BETWEEN INCLUSION AND ISOLATION: A PILOT STUDY**

## **AUTORS**

Cristina Curto. Ramon Llull University. Faculty of Sports Sciences Blanquerna. Spain

Jose Morales. Ramon Llull University. Faculty of Sports Sciences Blanquerna. Spain

Emanuela Pierantozzi. University of Genoa. Department of Neuroscience, Rehabilitation, Ophthalmology, Genetics, Maternal and Child Health. Italy

## **ABSTRACT**

This study examined the effects of Judo lessons on people with intellectual disabilities (ID) and compared the effects of inclusive versus isolated situations. The results of the study indicated that both groups showed improvements in motor skills as measured by the Test of Gross Motor Development-3 (TGMD-3) over the control group, and there were no significant differences between the two groups that participated in Judo lessons in terms of improvements in motor skills. The study suggests that Judo is a beneficial activity for people with ID and that both inclusive and isolated situations can be effective for motor skill development. The results of the study are important because they suggest that Judo can be an inclusive activity for people with ID and that it can be an effective way to improve motor skills. The study also has implications for clinical practice and physical education. The results suggest that health professionals and physical educators may consider Judo as an activity to improve motor skills in people with ID. Furthermore, the results suggest that both inclusive and isolated situations can be effective for motor skill development. In summary, the pilot study suggests that Judo is a beneficial activity for people with ID and that both inclusive and isolated situations can be effective for motor skill development.

## **KEY WORDS**

Adapted judo, inclusive practice, isolated practice, motor skills, mental handicap.

## **INTRODUCTION**

The benefits of participation of children and adolescents with intellectual disability (ID) in specific organised sports programmes have long been investigated, e.g. swimming and aquatic exercise programmes (Fragala-Pinkham et al., 2011; Pan, 2011), participation in an adapted basketball programme aimed at improving physical fitness and social skills (Cai et al., 2020),

programmes based on adapted football games (Regaieg et al., 2020) or the effect of swimming on body composition in people with Down syndrome (Suarez-Villadat et al., 2020).

The practice of judo is perfectly adapted to the population with ID, as it is an activity that integrates moderate to vigorous intensity of activity with an added cognitive and emotional component, such as concentration and self-control (Garcia et al., 2019). The systematic review developed by (Pečnikar et al., 2020) highlights the improvements in health parameters and social skills through the inclusion of people with ID in adapted judo programmes. This type of activity has been shown to be attractive to young people with ID due to the repetitive structure of its exercises (Bell & Allen, 2016) and a recent study even demonstrated the feasibility of a family-based adapted judo programme for children with ASD (Garcia et al., 2022). The practice of judo has shown positive results in short-term programmes, with improvements seen in repetitive behaviours, social interaction and communication, and emotional response (Morales et al., 2021). This is evidenced by the improvements reported in an eight-week intervention study (Rivera et al., 2020), which found a reduction in aggressive behaviour in children with ASD who participated in an adapted judo programme. On the other hand, other research has demonstrated the feasibility and effectiveness of this type of programme, with high rates of acceptance and enjoyment found, and a high desire to continue the practice after the programme (Tomey, 2017).

Recent studies have demonstrated improved motor skills in children with ID who participated in an adapted judo programme over the course of a school year (Morales et al., 2022). This is particularly relevant as people with ID demonstrate difficulties in the motor domain (Colombo-Dougovito, 2015; Crucitti et al., 2020), which can impact on their ability to successfully interact and participate in the environment and social life (Bodison, 2015). There is considerable evidence of deficits in motor skills, with studies finding poorer development in children with ID in various motor domains, such as balance, postural control and general coordination (Downey & Rapport, 2012) or impairments in gait, laterality and fine motor skills (Kaur et al., 2018).

Traditionally, learning opportunities for people with ID have taken place in artificially segregated contexts and isolated sheltered workshops with the intention of better serving them (Thorn et al., 2009). Current trends seek to include people with disabilities in a fully normalised environment, where they are educated in the same space and under the same conditions as people without disabilities. Before proceeding with this argument, it is necessary to clarify the

terms integration and inclusion, recognising that they can be interpreted differently in different languages and often even in the same language (Sandri, 2014).

In the Anglo-Saxon culture, the concept of integration is interpreted as the adaptation of the person with a disability to the school context, where the content is adapted to facilitate learning and thus access to education, usually in spaces where all participants need adaptations. Inclusion, on the other hand, takes into account the right of everyone not to be excluded and advocates the timely integration of people with ID into the same educational environment as people without ID (Sandri, 2014). Grandisson et al. (2012) examined various factors involved in the sports integration of adolescents with intellectual disabilities alongside non-disabled athletes and concluded that inclusive sports can generate many benefits for people with intellectual disabilities, their parents and non-disabled athletes.

In the case of judo, there are no studies that compare the effects of judo programs on people with ID based on the grouping of participants. The observation of different experiences shows that in many cases the training of people with ID in judo sessions is done in isolation, that is, the participants are exclusively people with ID, on the other hand, it is also possible to find numerous experiences in which people with ID are trained in the same sessions as people without ID. The main objective of this study is to compare the effects in the motor domain of the participation in judo sessions of people with ID in isolation or in inclusion with people without ID, it is hypothesized that the group that participates in inclusive sessions will obtain better results.

## **METHODS**

### **Participants**

Twenty-one boys and girls with aged 13.41 ( $\pm$  1.56) years, with a height of 159.91 ( $\pm$  13.79) cm and a weight of 59.03 ( $\pm$  18.61) kg from different associations of families of children with ASD and schools for children with special needs participated in the study. All participants had been diagnosed with ASD according to the criteria of the Diagnostic and Statistical Manual of Mental Disorders - Fifth Edition (DSM-V), and their ID was rated as low to moderate. Individuals were excluded if they had a medical condition that precluded physical activity. All participants participated on a voluntary basis, and parents or guardians signed an informed consent form, and children signed a consent form explaining the aims and development of the programme. This research complies with the requirements specified in the 1975 Declaration of

Helsinki and its subsequent revisions. This study has been approved by the Research Ethics Committee of the Universitat Ramon Llull with file number CER URL\_2019\_2020.

### **Procedure**

A three-month longitudinal study was designed with pre- and post-intervention measures. The intervention consisted of participation in a judo programme with different methodologies. A convenience sample was used that had been participating in an adapted judo programme exclusively for people with ID for one year. This group was divided into an inclusion group (n=7) to participate in regular judo classes with children without ID and an isolated group (n=8) that participated in judo sessions exclusively for children with ID. In parallel, a control group (n=6) was recruited who did not engage in any physical activity or participate in any sports programme. Each participant was assessed twice, at the beginning of the programme and at the end of the programme, under stable conditions in the same room where the judo sessions took place.

### **Intervention**

The groups that participated in the judo sessions were provided with volunteer support staff for the development of the practice who were instructed to act only in case of need. The sessions were held twice a week with a duration of 1h in a dedicated judo facility with a tatami surface of 120 m<sup>2</sup> and with all the elements that preserved the safety of the practitioners. The main content of the sessions included: Falling techniques, judo analytical techniques and judo games, ground control techniques and throws, and repetitions of basic movements in different forms (pulling, pushing, holding, lifting).

### **Assessment Instruments**

All participants were assessed twice, at the beginning and at the end of the six-month intervention, with the Test of Gross Motor Development (TGMD-3) (Ulrich, 2019).

The primary function of the TGMD-3 is to identify delays and deficits in gross motor development in children and to serve as a research tool to explore and compare the gross motor development of both typically developing children and children with atypical movement function. The assessment includes two subtests of locomotor skills and ball skills representing fundamental motor skills. After analysis, the scores of the locomotor subtest and the ball skills subtest were summed to provide a raw score.

### **Statistical analysis**

All descriptive data for the dependent variables are presented as mean  $\pm$  standard deviation (SD). The normal distribution of each variable was tested using the Shapiro-Wilks test. To test the hypotheses, a one-way ANOVA test was used to compare the variation in the results of the three groups. When univariate contrasts showed statistically significant effect, pairwise comparisons were made using the Tukey correction. The variation in scores was calculated in absolute terms by subtracting the pre-test scores from the post-test scores. All statistical analyses were performed using the Statistical Package for Social Science version 24.0 (SPSS, Inc., Chicago, IL, USA). A significance level of  $p < 0.05$  was used for all tests.

## RESULTS

The application of the one-way ANOVA test shows that there is an effect depending on the judo practice group in the variation of the pre-post-test results of the TGMD-3-Locomotion variables ( $F_{(2,18)}=20.39$ ;  $p<0.01$ ) and TGMD-3-Total ( $F_{(2,18)}=13.03$ ;  $p<0.01$ ), while the variable TGMD-3-Ball did not show any significant effect. Table 1 shows the descriptive statistics and the comparison between pairs of the post-hoc tests. The pairwise comparison shows that the groups that participate in judo sessions have statistically better results than the control group in the results of locomotion skills and the result of the total score of the TGMD-3. The group that participates in inclusive judo sessions does not show significant differences in any of the variables compared to the group that participates in exclusive sessions for children with ID.

**Tabla 1. Descriptive statistics**

	Group	N	Mean	SD
TGMD-3-Locomotion	Inclusion	7	2.143*	0.690
	Isolated	8	2.625*	0.518
	Control	6	0.667	0.516
TGMD-3-Ball	Inclusion	7	1.043	0.690
	Isolated	8	0.750	0.463
	Control	6	0.667	0.516
TGMD-3-total	Inclusion	7	3.286*	0.756
	Isolated	8	3.500*	0.926
	Control	6	1.333	0.816

\* means significant differences ( $p<0.05$ )

## DISCUSSION

This study aimed to analyse the benefit of practicing judo in a population with ID in the motor domain, comparing the possible difference between judo lesson in inclusive situation versus

isolated situation. In general, all judo students are improved in motor skills and the results are similar to those found in our previous work following an intervention over the course of a school year (Morales et al., 2022) and confirm the benefits of a systematic participation in judo. The comparison between the two situations study results don't confirm the initial hypothesis that the group participating in inclusive sessions would obtain better improvement, as most indicators showed progresses in both experimental group's scores after participating in the adapted judo program, only the control group did not display any significant changes. After the judo intervention, the ASD students in the two experimental groups recorded developments in motor skills, as measured by the total score on the TGMD-3 and the Locomotor Skills subscale. Those is possible probably because the organization of the Judo classes created enough motor stimuli in both learning situations. In inclusion lesson teacher teaches and neurotypical developmental students collaborate directly with ID peer during the exercises. In the isolated lesson, the teachers often work directly with the ID students to help the learning process, and because of the teacher skills the difficulties of ID students are compensates quicker and effectively comparing the inclusive situation, where peer must find a unknown solution to help the ID partner. The inclusive situation helps the neurotypical to learn to be collaborative but slow the rhythm of the activities compared with the traditional one.

Several previous studies have argued that inclusive practice can have many benefits for people with intellectual disabilities, their parents, and nondisabled athletes (Grandisson et al., 2012; Townsend & Hassall, 2007). To our knowledge, studies evaluating inclusive practice have done so from the perspective of the social competence of participants, both with and without disabilities, and have typically focused on how participants view intellectual disability, which has important implications for enhancing social inclusion and informing positive attitudes (Albaum et al., 2021), but not on differences from isolated practice.

The inherent limitations of this study as a pilot study call for a more comprehensive approach in the future, with a much longer intervention period, a larger number of participants, more behavioral domains analyzed, and control for participants' level of disability.

## **CONCLUSION**

This pilot study suggests that judo is a beneficial activity for people with ID and that both inclusive and isolated situations can be effective in developing motor skills.

Previous studies have mostly focused on improving social skills but have not compared the benefits in other areas. The limitations of this study call for a broader approach in the future to compensate for the lack of results in this area.

## REFERENCES

- Albaum, C., Mills, A., Morin, D., & Weiss, J. A. (2021). Attitudes toward people with intellectual disability associated with integrated sport participation. *Adapted Physical Activity Quarterly*, 39(1), 86–108.
- Bell, A., & Allen, M. (2016). Using Martial Arts to Address Social and Behavioral Functioning in Children and Adolescents With Autism Spectrum Disorder. *Therapeutic Recreation Journal*, 50(2), 176–181. <https://doi.org/10.18666/TRJ-2016-V50-I2-7287>
- Bodison, S. C. (2015). Developmental dyspraxia and the play skills of children with autism. *American Journal of Occupational Therapy*, 69(5), 1-6905185060p6.
- Cai, K.-L., Wang, J.-G., Liu, Z.-M., Zhu, L.-N., Xiong, X., Klich, S., Maszczyk, A., & Chen, A.-G. (2020). Mini-basketball training program improves physical fitness and social communication in preschool children with autism spectrum disorders. *Journal of Human Kinetics*, 73(1), 267–278.
- Colombo-Dougovito, A. (2015). Successful evidence-based practices for autism spectrum disorder and their use for the development of motor skills in physical education. *Palaestra*, 29(2), 34–42.
- Crucitti, J., Hyde, C., & Stokes, M. A. (2020). Hammering that nail: varied praxis motor skills in younger autistic children. *Journal of Autism and Developmental Disorders*, 50(9), 3253–3262.
- Downey, R., & Rapport, M. J. K. (2012). Motor activity in children with autism: a review of current literature. *Pediatric Physical Therapy*, 24(1), 2–20.
- Fragala-Pinkham, M. A., Haley, S. M., & O’neil, M. E. (2011). Group swimming and aquatic exercise programme for children with autism spectrum disorders: a pilot study. *Developmental Neurorehabilitation*, 14(4), 230–241.
- Garcia, J. M., Leahy, N., Rivera, P., Renziehausen, J., Samuels, J., Fukuda, D. H., & Stout, J. R. (2019). Brief Report: Preliminary Efficacy of a Judo Program to Promote Participation in Physical Activity in Youth with Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders*, 50(4), 1418-1424. <https://doi.org/doi:10.1007/s10803-019-04338-w>
- Garcia, J. M., Perry, C. T., Murray, M. L., Lavery, K. M., Brazendale, K., & Fukuda, D. H. (2022). *The feasibility of a family-based judo program for children with Autism Spectrum Disorder*.
- Grandisson, M., Tétreault, S., & Freeman, A. R. (2012). Enabling integration in sports for adolescents with intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities*, 25(3), 217–230.
- Kaur, M., Srinivasan, S. M., & Bhat, A. N. (2018). Comparing motor performance, praxis, coordination, and interpersonal synchrony between children with and without Autism Spectrum Disorder (ASD). *Research in Developmental Disabilities*, 72, 79–95.

- Morales, J., Fukuda, D. H., Garcia, V., Pierantozzi, E., Curto, C., Martínez-Ferrer, J. O., Gómez, A. M., Carballeira, E., & Guerra-Balic, M. (2021). Behavioural Improvements in Children with Autism Spectrum Disorder after Participation in an Adapted Judo Programme Followed by Deleterious Effects during the COVID-19 Lockdown. *International Journal of Environmental Research and Public Health*, *18*(16), 8515.
- Morales, J., Pierantozzi, E., Fukuda, D. H., Garcia, V., Guerra-Balic, M., Sevilla-Sánchez, M., & Carballeira, E. (2022). Improving motor skills and psychosocial behaviors in children with autism spectrum disorder through an adapted judo program. *Frontiers in Psychology*, *13*.
- Pan, C.-Y. (2011). The efficacy of an aquatic program on physical fitness and aquatic skills in children with and without autism spectrum disorders. *Research in Autism Spectrum Disorders*, *5*(1), 657–665.
- Pečnikar Oblak, V., Karpljuk, D., Vodičar, J., & Simenko, J. (2020). Inclusion of people with intellectual disabilities in judo: A systematic review of literature. *Archives of Budo*, *16*, 245–260.
- Regaieg, G., Kermarrec, G., & Sahli, S. (2020). Designed game situations enhance fundamental movement skills in children with Down syndrome. *Journal of Intellectual Disability Research*, *64*(4), 271–279.
- Rivera, P., Renziehausen, J., & Garcia, J. M. (2020). Effects of an 8-Week Judo Program on Behaviors in Children with Autism Spectrum Disorder: A Mixed-Methods Approach. *Child Psychiatry & Human Development*. <https://doi.org/doi: 10.1007/s10578-020-00994-7>
- Sandri, P. (2014). Integration and inclusion in Italy. Towards a special pedagogy for inclusion. *Alter*, *8*(2), 92–104. <https://doi.org/https://doi.org/10.1016/j.alter.2014.02.004>
- Suarez-Villadat, B., Luna-Oliva, L., Acebes, C., & Villagra, A. (2020). The effect of swimming program on body composition levels in adolescents with Down syndrome. *Research in Developmental Disabilities*, *102*, 103643.
- Thorn, S. H., Pittman, A., Myers, R. E., & Slaughter, C. (2009). Increasing community integration and inclusion for people with intellectual disabilities. *Research in Developmental Disabilities*, *30*(5), 891–901. <https://doi.org/https://doi.org/10.1016/j.ridd.2009.01.001>
- Tomey, K. L. (2017). *Effects of a Modified Judo Program on Psychosocial Factors in Typically Developing and Children with Autism Spectrum Disorder: a Mixed-Methods Study* [University of Central Florida]. <https://stars.library.ucf.edu/honorstheses/252>
- Townsend, M., & Hassall, J. (2007). Mainstream students' attitudes to possible inclusion in unified sports with students who have an intellectual disability. *Journal of Applied Research in Intellectual Disabilities*, *20*(3), 265–273.