International Journal of Research in Education Humanities and Commerce

Volume 07, Issue 01 "January - February 2026"

ISSN 2583-0333

EFFECTS OF AN ADAPTED TAEKWONDO INTERVENTION PROGRAM ON BALANCE ABILITY IN INDIVIDUALS WITH INTELLECTUAL DISABILITIES

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https://doi.org/10.37602/IJREHC.2025.7118

ABSTRACT

This study aimed to assess the balance improvements observed in individuals with intellectual disabilities following their engagement in a tailored Taekwondo intervention. Four male and four female adolescents, aged sixteen to eighteen years, who had intellectual disabilities, participated in the study. A diagnosis of Down syndrome was confirmed for two individuals. Pre-measurements were first performed in order to assess the participants level of balance, followed by a six-week intervention with a frequency of twice/week, lasting 60 minutes. A final measurement for balance assessment was conducted subsequent to the program's conclusion. Balance ability was assessed utilizing the standing stork test. Specifically, participants received instruction in fundamental stances, defensive maneuvers, kicks, punches, hand strikes, and the initial poomsae. Results indicated no substantial disparity between the preliminary and final assessments for either limb. The findings suggest that the basic Taekwondo intervention program for individuals with intellectual disabilities did not enhance their balance capabilities. This outcome may be attributed to the infrequent session schedule and the limited duration of the intervention. Future research should incorporate a higher training frequency, extended intervention periods, and additional balance-specific exercises to better determine the effectiveness of Taekwondo interventions for this population.

Keywords: Intervention Program, Balance, Taekwondo, Intellectual Disability, Motor Skills

1.0 INTRODUCTION

Intellectual disability (ID) is defined by notable constraints in cognitive abilities and adaptive functioning, encompassing conceptual, social, and practical competencies. This is a chronic condition that manifests prior to the age of eighteen and may present with varying degrees of severity, from mild to severe. Individuals with ID may necessitate different degrees of assistance, ranging from support for particular activities to continuous care. ID may impact an athlete's capacity to comprehend, acquire, and adhere to intricate rules or protocols, a consideration pertinent to para sports, encompassing anti-doping stipulations and competitive guidelines (Zhang, 2025).

Taekwondo is a martial art that upholds the traditions of ancient Korean combat systems. The indicators employed are specific artifacts originating from ancient Korea (Moening & Minho, 2016). In the early 1970s, the Korean government recognized the potential of martial arts as a sport. Once Tae kwon do was established as a sport available to amateurs and professionals alike, a demonstration occurred during the 1988 Korean Olympic Games in Seoul. In 1994,

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ISSN 2583-0333

WT (World Taekwondo) achieved formal recognition as a sport for the 2000 Olympic Games in Sydney. This event represented a significant initial achievement within the sport's historical progression (Dimitrov, 2022).

Adapted for athletes experiencing upper limb deficiencies, whether due to congenital causes, amputation, or neurological injuries, Para taekwondo is a full-contact martial arts sport. This sport adheres to principles and methodologies akin to conventional taekwondo, incorporating striking techniques, and prioritizes muscular power, nimbleness, and equilibrium as crucial elements for successful execution. The benefits of participating in para taekwondo, much like in other sports, are well-established for individuals with disabilities, offering contributions to greater self-confidence, improved social integration, and a higher engagement in daily routines. Research suggests that Para taekwondo athletes demonstrate improved functional balance in comparison to sedentary healthy participants. Conversely, individuals with upper limb impairments at or below the elbow level could experience diminished static balance relative to their non-impaired peers (Akınoğlu & Kocahan, 2025).

Individuals with ID participating in adaptive sports encounter distinct obstacles. This encompasses challenges in comprehending and adhering to regulatory frameworks, including anti-doping protocols, and the requirement for customized assistance and instruction. The classification framework and competitive organization should accommodate the distinct requirements and capabilities of athletes with intellectual disabilities to facilitate equitable and valuable involvement. Moreover, the integration of athletes with intellectual disabilities into para sports is shaped by overarching social, cultural, and policy dynamics, which in turn can affect the availability of opportunities and the trajectory of athletic careers (Zhang, 2025).

Participation in resistance training programs has been shown to increase muscle strength in individuals with ID. The purpose of the study by Carter and Horvat (2016) was to establish if Taekwondo training could lead to improvements in lower limb strength and balance among young adults presenting with Down syndrome. A total of 22 individuals with Down syndrome, comprising 10 women and 12 men between the ages of 21 and 30, constituted the research sample. Participants had the option of either participating in Taekwondo classes two days a week for a total of 10 weeks (n=22) or participating in the control group (n=22). The individuals in the control group continued their usual daily activities, such as walking. Furthermore, they committed to abstaining from all other organized athletic pursuits or physical engagement activities during the intervention period. Each Taekwondo class comprised a sixty-minute session, with sessions scheduled twice weekly throughout a ten-week semester. The results of the study showed that strength increased in the Taekwondo group by 44% from the preliminary test at 5 weeks of training and by an additional 25% from 5 to 10 weeks of training. A decline in physical capability was noted following a period of inactivity. The strength measurements for the control group exhibited stability. The researchers' findings indicated that Taekwondo may serve as an effective method for increasing strength in individuals with Down syndrome (Carter & Horvat, 2016).

The purpose of this study was to appraise the outcomes of a foundational Taekwondo skills intervention concerning balance in individuals with ID.

2.0 METHODS

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2.1 Participants

A sample of four individuals, aged between sixteen and eighteen years old, who have ID, was included in the research. The participants were involved in activities at a creative employment center in the prefecture of Central Macedonia in Serres, Greece. Individuals experiencing injuries that could impair their performance or elevate health risks were not included in the investigation. The eligibility criteria stipulated that all participants must have a diagnosis of ID and/or Down syndrome, as individuals with other disabilities were not excluded.

2.2 Measuring instruments

To evaluate the static balance of the participants, the measurement was performed with a stopwatch on a Samsung Galaxy A53 5G smartphone, and the effort was recorded in seconds.

2.3 Materials

Taekwondo targets of varying sizes, including bananas and shields, alongside medium-sized hoops and balance stones (river stones), were utilized.

2.4 Task

The Standing Stork Test, which assesses balance ability, was used to measure static balance. This is a method commonly used by athletes and coaches to assess their static balance with the aim of minimizing injuries, while for non-athletes it is used to improve their balance (Johnson & Nelson, 1979). The Standing Stork Test was carried out using only a pen, pencil, a piece of paper and a mobile smartphone to record the results. Before the test, instructions were given to the participants. All parameters that could affect the participants' health were checked with the subjects' consent. A 10-minute warm-up was performed before the test began (Johnson & Nelson, 1979). During the procedure, participants remove their shoes and place their hands on their hips. Then they placed their bent foot on the inner knee of their balance foot. Participants were given one minute to practice their balance before measurement. The time measurement started as on as the wheel was lifted from the floor and ended when the wheel was back on the floor. Once the measurement was complete, the participants rested and repeated the procedure with the other foot. It was important that the participants lifted their support to their foot to allow themselves to balance on the centre of their foot. The timer could be stopped before the end of the measurement in the following cases: 1. In the case where the hands remained on the hips, 2. In the case where the support foot moved, i.e. if it bounced in any direction and the other foot lost contact with the knee, or 3. If the wheel of the support did not touch the ground. Three attempts were made for each support foot and the total trial time was recorded in seconds. The final score was the average of the best trial for the right and left foot.

2.5 Procedure

The director of the creative employment center was briefed on the program's particulars, including its purpose and tenure, during a meeting held one week prior to its initiation. Formal declarations were disseminated to guardians of participants, seeking approval for individuals with ID to engage in the program. Following the acquisition of signed declarations from the guardians, the program was initiated.

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All sesssions were held at the center for creative endeavors. During the initial session, held on March 22, 2025, attendees received comprehensive details regarding the program's operational framework and the specific domain for their practical exercises. Following consent to engage in the program, baseline assessments of postural stability were conducted utilizing the stork stance test. Two individuals encountered challenges in stabilizing the plantar aspect of their swinging foot medial to the knee. They were instructed to attempt to bring the interior of their ankle into contact with the knee of their weight-bearing leg.

The exercise program was designed according to the physical fitness of the participants. Each program lasted 60 minutes and consisted of a 10-minute warm-up and stretching session, learning Taekwondo techniques, practicing them in various ways and methods for 40 minutes, and finally a 10-minute cool-down session. As part of the program, techniques were taught concerning stances, defenses-blocks, kicks, punches, strikes with the hands, and the first poomsae, all adapted to the needs of the participants. The term "pumse" denotes the conventional forms and patterns utilized by individuals in their progression toward achieving the next belt rank (Fachrezzy et al., 2021). The weekly instructional modules were meticulously organized and recorded in a journal. This practice served to enhance the clarity of learning outcomes and permitted the observation of participant progress, consequently enabling a gradual increase in the program's rigor. All classes were taught by an experienced Taekwondo instructor, holder of a third Dan and with 14 years of experience in the sport. The program spanned a duration of six weeks, featuring weekly sessions twice/week. Twelve sessions, each lasting one hour, were conducted.

The final measurement of balance ability was taken on the day of the last meeting on 26/04/2025, after the end of the course and after the participants had been given time to rest. Personal reasons necessitated the exclusion of two participants from the concluding balance assessment. Consequently, the final assessment of both participants was conducted on May 13, 2025, a fortnight subsequent to the program's conclusion.

3.0 RESULTS

Table 1 shows the demographic data of the survey participants.

Table 1. Demographic data of participants

Participants	Gender	Age
Participant 1	Female	17
Participant 2	Female	17
Participant 3	Male	16
Participant 4	Male	18

Table 2 shows the mean values of the initial and final performances of the participants in the Standing Stork Test for both lower limbs.

Table 2. The mean performance scores derived from the stork test are as follows: left and right lower limb

Participants	Age	Initial measurement left lower limb	Final measurement left lower limb	Initial measurement right lower limb	Final measurement right lower limb
Participant 1	17	15,70′′	16,18′′	18,09′′	18,26′′
Participant 2	17	29,62′′	30,60′′	19,54′′	20,37′′
Participant 3	16	01,59′′	01,88′′	02,04′′	02,24′′
Participant 4	18	67,48′′	77,22′′	33,79′′	53,82′′

Statistical analyses were conducted utilizing SPSS version 20. The t-test for dependent samples was used to investigate whether there were statistically significant differences between the initial and final measurements for the right foot. The results showed that there were no statistically significant differences with $t(3) = -1.074$ for $p > 0.05$.

The t-test for dependent samples was used to investigate whether there were statistically significant differences between the initial and final measurements for the left foot. The results indicated no statistically significant differences, with $t(3) = -1.252$, $p > 0.05$.

4.0 DISCUSSION

The purpose of this study was to examine the effect of a Taekwondo program with basic techniques on the balance ability of individuals with ID. More specifically, the study focused on evaluating the improvement in the static balance ability of individuals with ID after participating in a Taekwondo program.

The results of the study showed that after the intervention program, there were no statistically significant differences in the balance ability of individuals with ID between the initial and final measurements on both lower limbs of the participants. Hsu's (2016) study yielded different conclusions, as it was observed that children with ASD exhibited improved balance skills subsequent to participating in Nintendo Wii digital games. Furthermore, the findings of Fong et al. (2012) indicated that even brief engagement in Taekwondo may yield substantial improvements in unilateral balance for those diagnosed with motor coordination disorder.

The current study's results differ from those of Mikołajczyk et al. (2014), who observed an improvement in the static balance of adolescent participants with ID. The program was predicated upon functional exercises performed on unstable surfaces. Furthermore, Lee et al. (2016) structured their program with balance exercises, which participants practiced, concluding that balance exercises positively impact the balance ability of individuals with ID, irrespective of the degree of disability. Dehghani and Gunay (2015) likewise posited that by selecting appropriate exercise types and implementing a well-structured program, balance improvement is achievable.

In their research, Carter and Horvat (2016) determined that Taekwondo presents itself as a martial art with the potential to augment the strength of individuals diagnosed with Down

syndrome. The research indicated that Taekwondo can notably enhance the physical well-being of individuals with Down syndrome. Contrary to the findings of the Carter and Horvat (2016) study, this research observed that, despite the participation of individuals with ID in the Taekwondo program, there was no improvement in their balance ability. As a result, the program yielded no beneficial outcomes for individuals diagnosed with ID.

Taekwondo is a martial art that simultaneously enhances physical conditioning and interpersonal communication among its practitioners. Individuals diagnosed with ID encounter challenges in motor function and communication during their daily routines. In conclusion, the Taekwondo intervention program, with a low training frequency, had no effect on the balance of participants with ID. Nevertheless, enhanced social interaction was noted, demonstrated by augmented social engagement and the cultivation of rapport with the investigator. Attendees consistently demonstrated enthusiasm and a readiness to acquire a novel Taekwondo technique during each session. Moreover, following the initial two sessions, participants exhibited enhanced self-assurance and conviction regarding their proficiencies. Initially, a reluctance was observed in the participants regarding the execution of high and more strenuous kicks. Nevertheless, this was not without its limitations, and as the discussions continued, apprehension noticeably diminished. Future interventions with longer durations or increased training frequency may also yield improvements in motor function.

Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

1. Akınoğlu, B. & Kocahan, T. (2025). Balance Ability in Para Taekwondo Athletes: A Cross-Sectional Study. Journal of Manipulative and Physiological Therapeutics, 48(6), 770-777. https://doi.org/10.1016/j.jmpt.2025.10.062
2. Carter, K. & Horvat, M. (2016). Effect of Taekwondo training on lower body strength and balance in young adults with Down Syndrome. Journal of Policy and Practice in Intellectual Disabilities, 13(2), 165-172.
3. Dimitrov, I. (2022). Evolution of Taekwondo from spiritual and cultural to a martial sport. Proceeding book, 435.
4. Dehghani, M. & Gunay, M. (2015). The effect of balance training on static and dynamic balance in children with intellectual disability. Journal of Applied Environmental and Biological Sciences, 5(9), 127-131.
5. Fachrezzy, F., Maslikah, U., Hermawan, I., Nugroho, H., Jariono, G. & Nurulfa, R. (2021). Kicking ability for the Eolgol Yoep Chagi Taekwondo Poomsae in terms of quality of physical condition, self-confidence, and comparison of leg muscle explosive power and core stability. Journal of Physical Education and Sport, 21, 2337-2342.
6. Fong, S.S., Tsang, W.W. & Ng, G.Y. (2012). Taekwondo training improves sensory organization and balance control in children with developmental coordination disorder: A randomized controlled trial. Research in developmental disabilities, 33(1), 85-95
7. Johnson, B.L. & Nelson, J.K. (1979). Practical measurements for evaluation in physical education.4th, Edit. Minneapolis: Burgess.
8. Hsu, T.Y. (2016). Effects of Wii Fit balance game training on the balance ability of students with intellectual disabilities. Journal of physical therapy science, 28(5), 1422-1426.

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ISSN 2583-0333

9. Lee, K., Lee, M. & Song, C. (2016). Balance training improves postural balance, gait, and functional strength in adolescents with intellectual disabilities: Single-blinded, randomized clinical trial. Disability and health journal, 9(3), 416-422.
10. Mikołajczyk, E. & Jankowicz-Szymańska, A. (2014). The effect of unstable-surface functional exercises on static balance in adolescents with intellectual disability–a preliminary report. Medical Studies/Studia Medyczne, 30(1), 1-5.
11. Moenig, U. & Minho, K. (2016). The invention of Taekwondo tradition, 1945–1972: When Mythology becomes' History'. Acta Koreana, 19(2), 131-164.
12. Zhang, A.M. (2025). Mental Health Symptoms and Disorders in Elite Paralympic Athletes: A Clinical Review. Advances in Psychiatry and Behavioral Health, 5(1), 17-25. https://doi.org/10.1016/j.ypsc.2025.02.002

