

PERSPECTIVES OF PARENTS ON HEALTH BENEFITS ASSOCIATED WITH TAEKWONDO FOR ADOLESCENTS AND YOUNG ADULTS WITH INTELLECTUAL AND DEVELOPMENTAL DISABILITY

Junhyoung KIM¹, Yongseop KIM¹, Jennifer PIATT¹, Minjoon JI²

¹ School of Public Health, Indiana University, Bloomington, IN, United States of America

² College of Health Sciences, Kyungnam University, Changwon, South Korea

ABSTRACT

Taekwondo may serve as an important therapeutic programme to promote physical, social, cognitive and emotional health among adolescents and young adults with intellectual and developmental disability (IDD). Little research has explored the value of Taekwondo for health benefits among adolescents and young adults with IDD living in the United States. The purpose of this study was to capture health benefits associated with Taekwondo among adolescents with IDD from the perspectives of parents and observations. Using semi-structured in-depth interviews with eight participants, four salient themes were identified as health benefits that Taekwondo participation provided for their child: (a) emotional benefits, (b) social benefits, (c) cognitive benefits, and (d) physical benefit. The findings of this study indicate that Taekwondo can improve the physical, social, emotional, and cognitive functioning of adolescents and young adults with IDD and may be considered an effective mind-body exercise programme for promoting their health and well-being in these domains.

Keywords: Health; Qualitative approach; Taekwondo; Intellectual disability; Developmental disability.

INTRODUCTION

People with intellectual and developmental disability (IDD) experience high levels of emotional and cognitive problems that are often a result of a variety of life challenges in communicating, learning and socialising. These problems include, but are not limited to anxiety, depression and dementia (Myers & Pueschel, 1991; Kim *et al.*, 2000; White *et al.*, 2009). For example, children with autistic spectrum disorder (ASD) reported higher rates of anxiety and depression than children without it (Kim *et al.*, 2000). In addition, Mazurek *et al.* (2013) found that people with IDD exhibit maladaptive and aggressive behaviours and demonstrate deficient social and communication skills (Mazurek *et al.*, 2013). They also showed that aggressive behaviours are associated with self-injury, sleep problems and sensory problems. Thus, reducing emotional distress and maladaptive behaviours and increasing health and well-being are critical issues for public health researchers.

Prior studies have stressed the importance of participation in physical activity for the health and well-being of adolescents and young adults with IDD (Tsimaras & Fotiadou, 2004; Izquierdo-Gomez *et al.*, 2015). They demonstrated that physical activity has been associated with improved physical functions of adolescents and young adults with IDD, such as executive functioning and delayed onset or prevention of Alzheimer's disease. In addition, participation

in physical activity allows people with IDD to socialise with others, resulting in increased sense of belonging and connectedness and enhanced self-esteem (Balan & Marinescu, 2015; Fiorilli *et al.*, 2016). For example, Ciocan *et al.* (2016) provided evidence that participation in physical activity helped children with IDD develop social skills, such as mutual learning and teamwork, as well as a sense of camaraderie.

Given the health benefits of physical activity, Taekwondo, a Korean form of martial arts, can be an effective programme for promoting the physical, social, cognitive and emotional health of adolescents and young adults with IDD. Taekwondo involves dynamic physical movements, such as various stances, punching, kicking and self-defence techniques as invigorating components (Krstulovic *et al.*, 2010). In addition to the benefits of these movements to the physical functioning of adolescents and young adults with IDD, researchers have explored Taekwondo's emotional and cognitive benefits and found that Taekwondo participants enhanced their self-confidence, mental strength, self-awareness and cognitive abilities (memorisation of a series of movement) (Lakes & Hoyt, 2004; Tadesse, 2016). From a social perspective, Taekwondo promotes understanding of others and teaches cooperation and concern for others over self (Kim *et al.*, 2012). For example, a study conducted by Ortenburger *et al.* (2017) provides evidence that Taekwondo students aspired to share learning experiences and passion for their involvement in the art and displayed effective social skills when dealing with life conflicts.

Taekwondo may serve as an important therapeutic programme to promote physical, social, cognitive and emotional health among adolescents and young adults with IDD. However, the majority of previous studies have focused on physical functioning associated with Taekwondo exercises (Cromwell *et al.*, 2007; Kim *et al.*, 2016). While a few studies have provided evidence of Taekwondo's positive effects on social and mental health in Eastern countries (Lee, 2009; Kim *et al.*, 2018), there has been little exploration of the social, cognitive and emotional benefits associated with Taekwondo participation among adolescents and young adults with IDD living in Western countries, including the United States, which could provide valuable insights to help practitioners design and implement Taekwondo programmes for their clients with IDD. In addition, this study may add to the body of knowledge about evidence-based interventions related to martial arts programmes for adolescents and young adults with IDD.

Taekwondo and health benefits

Taekwondo, a form of Korean traditional martial arts, is considered the most prevalent form of mind-body exercise among adolescents and young adults in South Korea and gaining popularity throughout the world. According to a national survey conducted by Kukkiwon, the World Taekwondo Headquarters, there are 10 million Taekwondo blackbelt holders in 205 countries worldwide (Kukkiwon, 2018). One of the reasons Taekwondo has gained popular momentum is the intersection of mind and body experiences. The essence of martial arts is to cultivate inner strength through various physical movements and develop self-discipline. Thus, unlike most sports, Taekwondo is a whole-body activity that involves disciplined training in offense and defence movements that emphasises personal growth through the training process rather than competition. This training helps adolescents and young adults of martial arts to understand Taekwondo's inherent value of internal growth through discipline, self-control and understanding of others and apply it to their lives (Lakes & Hoyt, 2004; Tadesse, 2016).

Prior studies have demonstrated that Taekwondo can be effective in promoting physical functioning among people with disabilities and older adults (Cromwell *et al.*, 2007; Kim *et al.*,

2016). Cromwell *et al.* (2007) found that 20 older adults gained improved balance, multidirectional reaching ability, walking velocity and gait stability after 11 weeks of training. Kim *et al.* (2016) implemented an eight-week Taekwondo programme for 14 children with autism spectrum disorder, after which participants reported greater improvements in a single-leg stance balance with eyes closed condition than non-participants. Carter and Horvat (2016) investigated the relationship between increasing lower body strength and balance through Taekwondo among people with Down syndrome. The result suggested that the Taekwondo participants showed a significant improvement in lower body strength and balance after 10 weeks of training and a decrease in strength after detraining.

Kim *et al.* (2018) investigated the association of Taekwondo with social competence and quality of life among 320 athletes with a variety of disabilities including IDD at a rehabilitation hospital in Korea. They found that Taekwondo experience positively affected such competencies as social stability and leadership, which resulted in improved quality of life. Lee (2009) studied the development of sociality of six mildly developmentally disabled children, who participated in Taekwondo for 16 months and found that Taekwondo participation not only reduced their aggression and increased their physical fitness, but also improved their self-control, relieved their anxiety and facilitated their access to peer groups. Although these prior studies have demonstrated the impact of Taekwondo on health outcomes, these authors found no prior research that specifically examined the role of Taekwondo on addressing cognitive, emotional and physical concerns among adolescents and young adults with IDD.

PURPOSE OF RESEARCH

Given these findings, as well as the need for research focusing on adolescents and young adults with IDD living in Western countries, the aim of this study was to explore how Taekwondo participation helps adolescents and young adults with IDD from their parents' perspectives. Furthermore, this study aimed to determine the health benefits associated with Taekwondo participation among adolescents and young adults with IDD living in the United States. Considering the various cognitive levels of adolescents and young adults with IDD, this study was designed to extract health benefits as a result of Taekwondo participation from parents of adolescents and young adults with IDD.

METHODOLOGY

Research design

To capture the health benefits of Taekwondo participation for adolescents and young adults with IDD disabilities, a qualitative observational approach was used. DeWalt and DeWalt (2002:92) proposed that "the goal for design of research using participant observation as a method is to develop a holistic understanding of the phenomena under study that is as objective and accurate as possible given the limitations of the method". They suggest that a qualitative observational research allows researchers to have an in-depth understanding of a phenomenon and its social context under certain circumstances. This was also the most appropriate for this population, as self-administered surveys would be difficult due to the various cognitive levels of the participants.

Participants

A criterion-based sampling strategy was employed to recruit participants. The inclusion criteria were parents of adolescents and young adults who were diagnosed with IDD, who had been learning Taekwondo for a minimum of six months. The research team contacted a local YMCA that offered an adapted Taekwondo programme for adolescents and young adults with IDD. With permission from the programme director, fliers were posted to recruit potential participants to be interviewed. Eight participants (7 females and 1 male), ranging in age from 43 to 70 years (Mean=56.125), voluntarily participated in this study (Table 1a.). In terms of their children's demographic information (Table 1b), four were males and three were females. Four were diagnosed with Autistic Spectrum Disorder and three had Down Syndrome. The average age of their adolescents and young adults was 18.2 years old, ranging from 10 and 24 years old, and the average length of their Taekwondo training period was over 3.3 years. In terms of data saturation, this study reached a saturation point when the sixth participant was interviewed, after which additional themes were not identified.

Table1a. DEMOGRAPHIC INFORMATION

Participants	Information
<i>Interviewees</i>	
Age (yrs)	43-70 Mean=56.125
Gender	Female=7 Male=1
<i>Children</i>	
Age (yrs)	10-24 Mean=18.2
Gender	Female=3 Male=4
Training (yrs)	2-5 Mean=3.3

Table1b. CHILDREN: PERSONAL INFORMATION

No.	Name	Gender	Age	Type of disability
1.	Madelynn	F	21	Down syndrome
2.	Matthew	M	24	Autism
3.	Dayton	M	14	Autism
4.	Madison	F	21	Down syndrome
5.	Brayden	M	10	Autism
6.	Jane	F	18	Down syndrome
7.	Paul	M	18	Autism

Ethical considerations

This research project complied with research ethics and norms, the codes and practices by the sponsoring university Institutional Review Board. Every research participant was given necessary forms and information (consent/assent form, the purpose of the study and withdrawal procedures). The protocol number approved is 1909198382.

Interview protocol

A semi-structured, in-depth interview with each participant was conducted at a private location of his/her choice, such as his/her home, a cafeteria, or the YMCA. Interviews lasted between 40-60 minutes. The interview protocol consisted of five main questions that incorporated a content mapping and content mining strategy into the interview process. Examples of content mapping questions were, 'please tell me your overall observations about Taekwondo' and 'tell me about your experience while your child has been learning Taekwondo'. These questions helped the researchers to explore the parent's general involvement with their child's experience of Taekwondo.

Content mining questions were used to capture participants' views of specific benefits from Taekwondo. Examples of these questions included, 'what benefits do you think that your child has gained?', 'based on your observations, what role, if any, has this Taekwondo programme played in helping to improve your child's health?' and 'have you thought that Taekwondo may affect your child's life in any manner?' These questions were asked to participants in the same order. To acquire reliable data from participants, one of the researchers initiated and conducted each interview. After each interview, participants were asked to provide demographic information that included age, family background and the time span of Taekwondo practice.

Data analysis and trustworthiness

Creswell's (2009) five steps of data collection and analysis were followed in this study, which included: (a) raw data generation (interview transcriptions and field notes); (b) data organisation and preparation for analysis; (c) data comprehension; (d) code production and (e) data interpretation for meaning. For data analysis, the constant comparative method suggested by Merriam (1998) was used, whereby three researchers created and interpreted themes and subthemes from each data source independently while comparing and contrasting them concurrently and later negotiated any differences to reach consensus.

To increase credibility of the data analysis, a member-checking method suggested by Peterson *et al.* (2007) was used, which involved showing participants direct quotes from their interviews with our interpretations so they could express their level of satisfaction with our understanding. A member-checking process after three-month data analysis was evaluated. In addition, an independent investigator was invited to review the data process and data interpretations to verify the accuracy and consistency of the findings. This triangulation strategy applied by the investigator was helpful to reduce researcher bias and to increase the credibility of data analysis (Carter *et al.*, 2014).

FINDINGS

Participants identified various aspects of health benefits through their adolescents or young adults' Taekwondo participation from their observations. Based on their statements and experiences, four salient themes were identified as health benefits that Taekwondo participation provided for their child: (a) Emotional benefits, (b) social benefits, (c) cognitive benefits, and (d) physical benefits. These themes indicate that Taekwondo can be an effective treatment programme for health promotion among adolescents and young adults with IDD.

Emotional benefits

Emotional benefit was the most salient theme that emerged from the data. All the participants indicated that their children's happiness, confidence and enjoyment increased as outcomes of Taekwondo. Based on their observations during and outside Taekwondo sessions, they reported that their children expressed excitement and happiness about learning Taekwondo. Megan (female, 55) stated that without her son's Taekwondo sessions, he would spend a significant amount of time alone. She also indicated that he had become an enthusiastic Taekwondo learner and that Taekwondo made him happy and satisfied. Similarly, Cassey (female, 64) stated, 'I think that Taekwondo makes him [her son] always happy. He's always happy, bouncing around.' He is listening somewhat to directions on what is expected. She also mentioned that her son was excited about Taekwondo class and enjoyed interacting with other learners.

Some participants indicated that experiencing progress in gaining Taekwondo skills made their children happy and excited and eager to demonstrate their Taekwondo skills and techniques. In Taekwondo, different belt colours represent different skill levels. Participants mentioned that their children put significant efforts into attaining next levels of belt colours, an achievement that gave them a gratifying sense of accomplishment. Their participation in Taekwondo demonstrations also increased their confidence and excitement and delighted their parents. For example, Penelope (female, 70) stated:

They (parents who have children without a disability) don't understand the joy we get from seeing them progress. Trevor the other day said how excited he was to get his yellow belt. The person that works with him during the day said that's all he talked about all day long.

She also mentioned that her son's achievements not only made him happy and excited but also helped him develop perseverance and become mentally stronger.

In a similar manner, Max (male, 44) said that his son was excited about his advancing Taekwondo skills and techniques. Max mentioned that he was proud of his son's enjoyment and achievement, saying that:

He was very excited about it [achieving the next level]. He asked us [his mother and I] to take pictures. And he knows the order of the belts as well. Who got what colour? He was really excited to get it and then was like "now I will get the next colour".

The parents found that the experience of progress gained from the concrete achievement of rising to the next level was encouraging for their children, whose happiness they shared.

Another benefit, some participants perceived their children gained from Taekwondo participation, was improved self-control, pointing out the value to their children of the meditation component of Taekwondo. For example, Cassey (female, 64) indicated that her son became calmer and more self-controlled himself through Taekwondo. Jane (female, 61) emphasised that Taekwondo provided structures to her son in terms of body movement, rules, and mind-body harmony. Such structures helped him remain calm and self-controlled. Lilly (female, 43) stated:

The meditation has been good for him. I didn't know how that was going to go. He still tries to ask questions, but it's been good discipline for him to try to be quiet during that time. I can tell he's really trying to make sure that during that five minutes he's not talking, which I know is really hard for him. He's got everything going on in his mind.

In a similar manner, according to Tessa (female, 58):

They [students] didn't think it was going to work, and it didn't at first, but now they sit quiet. One kid will come in, and if he's late he will come and sit quiet all by himself. The new boy even knows. They're not always quiet but they have to be quiet when they meditate.

These examples show that Taekwondo learners experienced happiness and excitement, enhanced confidence and self-esteem, and improved self-control through the structured movements and the discipline of meditation of Taekwondo. These benefits can contribute to emotional health.

Social benefits

All of the participants mentioned that Taekwondo provided their children with opportunities to socialise with other learners, volunteers and an instructor and establish personal friendships. For example, Megan (female, 55) stated that her child maintained and developed friendships with other learners, with whom she participated in other activities, such as watching movies, playing other sports and studying. In addition, Penelope (female, 70) emphasised the importance of Taekwondo as a way for her child to initiate conversations with others. She stated:

He (her child) could talk to them like “oh, what belt are you? How long did it take you to get your green belt?” This is improved socialisation for him. He learned another part of life and learned about other students’ interests and activities and just expanded his horizons.

She also indicated that Taekwondo was beneficial for her child to develop communication skills and experience positive social interactions.

Development of social skills was another beneficial outcome the participants observed. They mentioned that their children felt more comfortable interacting with others as they learned the unique cultural aspects of Taekwondo. Max (male, 44) indicated that his child learned how to respect others in a more culturally appropriate manner, such as bowing or using two hands. In addition, Penelope (female, 70) indicated that her child gained more confidence as she learned to express her emotions and feelings in an appropriate manner that took into account the feelings of others. For example, she observed that her child praised fellow students for their Taekwondo demonstrations. Lilly (female, 43) also stated, “It amazes me that here are these individuals with their own challenges, but here they are so worried about other people and have become so positive”.

A social benefit for the participants themselves was that they established and developed intimate friendships with other parents through the Taekwondo programme. They mentioned that they shared similar life experiences and valuable information about community-based resources for their children. Through sharing experiences and useful information, they provided emotional and social support for each other. For example, Maria (female, 54) stated that she embraced new parents who came into the programme and easily bonded with them because of their similar experiences as parents. Also, Meagan (female, 55) said:

All the parents ... get together [on days] besides Fridays when we’re there. We’re all in the same boat. We all have kids with disabilities, and we all understand each other. We know each other’s kids and if they’re having a good day or a meltdown or whatever, nobody judges each other. Everybody’s been through it. When we have new families come in, we try to embrace them. We try to bring them in and let them know the ropes. I think it’s just one big happy family. It’s been a great journey with the parents.

These examples indicate that the children of participants were allowed to interact with others in the context of Taekwondo and develop social skills and friendships. In addition, participants created and fostered intimate friendships and exchanged valuable resources and information among themselves, showing that Taekwondo is conducive to social benefits not only for Taekwondo learners but also their parents.

Cognitive benefits

Some participants believed that practising Taekwondo helped their children to internalise a series of physical movements that stimulated their brain functions, for example, when they successfully performed a series of *Poomsae* (Taekwondo movements) and moved to the next level of advanced skills with a different colour of belt. Meagan (female, 55) believed that her child showed better cognitive abilities by demonstrating advanced Taekwondo skills and techniques, stating that “I never expected to see her successfully execute Taekwondo forms”.

In addition, they indicated that by following the directions of Taekwondo, their children improved concentration and attention skills. For example, Max (male, 44) indicated that setting goals to achieve different levels of Taekwondo belts encouraged his son to concentrate on Taekwondo movements. Megan (female, 55) also mentioned the learners’ ability to follow the directions of the movements. She stated,

It’s good for brain development because they have to remember all that stuff. They have to retain their next move. That keeps them focused and I like that. For kids that really need to focus, this is a great class for them to get in there and do that.

She also mentioned that her child made efforts to remember each course of physical movements and enjoyed demonstrations.

In a similar manner, Maria (female, 54) said that Taekwondo allowed her child to focus on each form of *Poomsae* and to test her understanding and memory skills for next belt examination. Through this process, she believed that her child improved in cognitive functioning and experienced brain development. In addition, by demonstrating her ability for each *Poomsae*, she gained more confidence and satisfaction, which contributed to her cognitive development. Lilly (female, 43) stated:

Taekwondo helps the development of participants’ understanding ability because training is done through the interactions between trainees and leaders. In addition, the training process helps them improve their concentration.... It’s fun to watch him, especially during his test. It’s better because now you can see him actually thinking about what movement he’s supposed to do whereas before he didn’t do that. I think it’s helped with his focus, [with] thinking about what he’s supposed to do, and focusing on that.

She observed that her son had become better at responding to instructions and following directions.

These examples show that participants observed the development of their children’s cognitive abilities through Taekwondo participation. By following directions and successfully demonstrating the series of physical movements of each *Poomsae*, Taekwondo participants improved their concentration and attentions skills, suggesting that Taekwondo may contribute to cognitive skills.

Physical benefits

Improved physical functioning was another salient theme that emerged from the data. Participants mentioned that Taekwondo’s dynamics of physical movements, such as holding various stances, punching, kicking, and practicing self-defence enhanced their children’s physical functioning in such areas as coordination, balance, gross motor skills and physical strength. Penelope (female, 70) mentioned the benefits her son gained from Taekwondo’s series of physical movements that required coordination and balance. She stated,

We found out that he had something called a central auditory processing disorder. It was during the diagnosis of that that I learned about the weak connection between the two

hemispheres of his brain. We had been doing many things that would make him cross the midline of his body physically, but I didn't realise until after he was finished with Taekwondo that it had actually helped with some of those connections.

She believed that by participating in Taekwondo, her children improved their auditory processing ability, as well as listening skills.

All the participants believed that Taekwondo was an effective physical exercise that allowed their children to be physically active. They mentioned that their adolescents and young adults enjoyed practising Taekwondo activities while gaining physical strength. They used similar expressions to describe the physical benefits of Taekwondo, such as "it is really good for her strength", "she has become much stronger with her kicks" and "he was sweaty, and he had gotten good exercise". In particular, they emphasised the improvement of their children's coordination and balance that they observed. For example, Lilly (female, 43) emphasised her son's improvement in both balance and muscle control:

But his balance has definitely gotten better over the years doing it. That's definitely been better. But you can also tell, he thinks about what he does and he's trying to do it right. His muscle movements tend to be choppy and quick, but I can tell he's trying, and he's gotten better.

She also reported that her son's gross motor skills were improved due to Taekwondo practices: "For gross motor skills, [and his ability] to follow what someone else is doing, it's fun to watch him, especially during his tests".

Improvement of coordination was another benefit of Taekwondo participation. Participants mentioned that their children became more coordinated after learning Taekwondo. Tessa (female, 58) stated that her son's eye-hand coordination and foot movements improved, which she attributed to his learning the basic movements of Taekwondo. In addition, Maria (female, 54) stated,

When she was younger, her hip was displaced because her ligaments were really loose, so her hip bone just came out of the socket. As she's gotten older, things have tightened up, her feet have gotten better. I think it has been very good. It goes along with her working out in Taekwondo, so I think it keeps her strong and coordinated.

These parents' testimonies indicate that the basic physical movements of Taekwondo improved their children's physical functioning in such areas as balance, coordination, motor skills and physical strength, confirming that Taekwondo has physical benefits for students with disabilities who invest sufficient time and energy in learning and practising it.

DISCUSSION

This qualitative study was an initial investigation into parents' perceptions of how Taekwondo can provide health benefits to their children with IDD. The findings of this study indicate that Taekwondo can improve the physical, social, emotional and cognitive functioning of adolescents and young adults with IDD and may be considered an effective mind-body exercise programme for promoting their health and well-being in these domains as it involved an invigorating component, such as various stances, punching and kicking moves and self-defence techniques.

The findings of this study support those of other studies with other disability groups that demonstrated Taekwondo participants gained self-regulation skills and mental satisfaction while reducing maladaptive behaviours (Lakes & Hoyt, 2004; Tadesse, 2016). Furthermore,

Taekwondo can promote self-confidence, self-esteem, and self-control. According to Vertonghen and Theebom (2010), children who participated in Taekwondo demonstrated greater personal growth and self-acceptance than children who did not. This study adds to the evidence that Taekwondo can help adolescents and young adults with IDD regulate their behaviours and experience other emotional benefits.

Lee (2009) emphasised Taekwondo's system of different belt colours as indicators of Taekwondo ranks and skills. Each level of Taekwondo introduces new techniques that adolescents and young adults with IDD can master and thus advance their rank. This study suggests that the cognitive work of memorising a series of movements to acquire new techniques can provide effective cognitive exercise for adolescents and young adults with IDD. In addition, the results of this study indicated that adolescents and young adults with IDD learned to set and pursue goals in order to elevate their skills and techniques and qualify for new belt colours, which served as an effective motivator for adolescents and young adults with IDD that produced both cognitive and emotional benefits.

With regard to physical benefits, Tadesse (2017) described the major components of Taekwondo as including form practices, self-defence exercises, stretching, physical fitness exercises and breathing exercises. Krstulovic *et al.* (2010) demonstrated that practising Taekwondo develops coordination, flexibility, postural control, muscular endurance and cardiovascular fitness among young children. In addition to these physical components of Taekwondo, the current study expands the body of knowledge about Taekwondo's physical benefits by suggesting that adolescents and young adults with IDD can improve balance, motor skills and coordination. This is further evidence that Taekwondo participation can help improve the physical health of adolescents and young adults with IDD.

Previous studies have also provided evidence that Taekwondo can create a context in which participants develop social skills and aspire to share their positive experiences with others (Kim *et al.*, 2012; Ortenburger *et al.*, 2017). The findings of this study indicate that both adolescents and young adults with IDD and their parents can establish and develop personal friendships and a sense of community through Taekwondo. This result suggests that Taekwondo can help adolescents and young adults with IDD have positive social interactions and interpersonal relationships with other learners as a group, and that demonstrating Taekwondo techniques and competing with other learners give them opportunities to develop teamwork and leadership skills.

Parents of adolescents and young adults with IDD who practised Taekwondo provided each other with emotional and social support and exchanged valuable information about resources for their children. Thus, Taekwondo programmes can serve as an important vehicle for social connection among both adolescents and young adults with IDD and their parents.

LIMITATIONS

Some limitations of this study need to be addressed. As a qualitative study, it focused the perspectives and observation of a small group of parents for insight into Taekwondo's benefits for adolescents and young adults with IDD. Their perspectives might have been biased and provided limited information about Taekwondo's benefits. In addition, the actual voice of the adolescent and young adults participating in Taekwondo was not examined. Thus, the parent's perception may not match that of their child's lived experience. Future studies may more directly explore Taekwondo's benefits for adolescents and young adults with IDD by eliciting their perceptions.

In addition, this study did not distinguish among levels of intellectual functioning and their associated challenges. Different levels of physical, cognitive, emotional and social functioning may be associated with participation in Taekwondo. Future researchers might examine the relationships among these and similar variables. There may be a strong relationship between the length of Taekwondo training and health benefits among adolescents and young adults. It may be interesting if future researchers investigate how the length of training affects health benefits.

IMPLICATIONS AND CONCLUSION

This study provides evidence that Taekwondo can have a positive impact on the lives of adolescents and young adults with IDD, suggesting that practitioners working with clients with IDD design and implement a Taekwondo intervention for their clients. In spite of their heterogeneity, many, if not most, adolescents and young adults with IDD can experience improved health and well-being by practising Taekwondo. It would be beneficial for practitioners to design Taekwondo programmes that include people without disabilities so that their clients can experience group dynamics with others. Healthcare professionals who utilise sport and recreation as a therapeutic intervention to address health outcomes may benefit from these findings to better design programmes that address the themes identified.

Finally, Mahy *et al.* (2010) indicated that one of the facilitators for physical activity participation among adolescents and young adults with IDD is to design and implement an invigorating and fun physical activity, such as exercise programmes with music. Based on their ideas, Taekwondo practices with music can facilitate the learning process and creates an enjoyable environment for adolescents and young adults with IDD. Practitioners might incorporate music into the Taekwondo intervention to generate a positive environment and encourage clients to fully engage in the practice, and modified versions of such activity can be tailored to clients' needs.

Acknowledgement

This work was supported by Kyungnam University Research Foundation Grant, 2018.

REFERENCES

- BALAN, V. & MARINESCU, G. (2015). Sports-means of social inclusion for Down Syndrome patients. *Journal of Revista Romaneasca pentru Educatie Multidimensionala*, 7(2): 111-117.
- CARTER, K. & HORVAT, M. (2016). Effect of Taekwondo training on lower body strength and balance in young adults with Down Syndrome. *Journal of Policy Practice in Intellectual Disabilities*, 13(2): 165-172.
- CARTER, N.; BRYANT-LUKOSIUS, D.; DICENSO, A.; BLYTHE, J. & NEVILLE, A.J. (2014). The use of triangulation in qualitative research. *Oncology Nursing Society*, 41(5): 545-547.
- CIOCAN, D.M.; ALEXE, D.I. & MAREȘ, G. (2016). The role of Special Olympics Program on developing motor and social skills for individuals with Down Syndrome. *Ovidius University Annals, Series Physical Education Sport/Science, Movement Health*, 16(2): 156-163.
- CRESWELL, J.W. (2009). *Research design: Qualitative and mixed methods approaches*. Thousand Oaks, CA: Sage Publications.

- CROMWELL, R.L.; MEYERS, P.M.; MEYERS, P.E. & NEWTON, R.A. (2007). Taekwondo: An effective exercise for improving balance and walking ability in older adults. *Journal of Gerontology Series A: Biological Sciences Medical Sciences*, 62(6): 641-646.
- DEWALT, K.M. & DEWALT, B.R. (2002). *Participant observation: A guide for fieldworkers*. Walnut Creek, CA: AltaMira.
- FIORILLI, G.; DI CAGNO, A.; IULIANO, E.; AQUINO, G.; CALCAGNILE, G. & CALCAGNO, G. (2016). Special Olympics swimming: Positive effects on young people with Down Syndrome. *Sport Sciences for Health*, 12(3): 339-346.
- IZQUIERDO-GOMEZ, R.; MARTINEZ-GOMEZ, D.; VILLAGRA, A.; FERNHALL, B. & VEIGA, Ó.L. (2015). Associations of physical activity with fatness and fitness in adolescents with Down Syndrome: The up and down study. *Research in developmental disabilities*, 36C(November): 428-436. doi:10.1016/j.ridd.2014.10.022.
- KIM, J.A.; SZATMARI, P.; BRYSON, S.E.; STREINER, D.L. & WILSON, F.J. (2000). The prevalence of anxiety and mood problems among children with Autism and Asperger Syndrome. *Autism*, 4(2): 117-132.
- KIM, M.S.; HWANG, S.H. & KIM, G.K. (2018). The influence of Taekwondo training experience on social competence and life of quality of severely handicapped. *Korean Journal of Growth and Development*, 26(1): 53-59.
- KIM, Y.; TODD, T.; FUJII, T.; LIM, J.C.; VRONGISTINOS, K. & JUNG, T. (2016). Effects of Taekwondo intervention on balance in children with Autism Spectrum Disorder. *Journal of Exercise Rehabilitation*, 12(4): 314-319.
- KIM, Y.K.; PARK, S.H. & CHUNG, Y. (2012). The relationships between Taekwondo character and Taekwondo life skills developed by Taekwondo educators. *International Journal of Applied Sports Sciences*, 24(2): 109-120.
- KRSTULOVIC, S.; KVESIC, M. & NURKIC, M. (2010). Judo training is more effective in fitness development than recreational sports in 7 year old girls. *Facta Universitatis Series: Physical Education and Sport*, 8(1): 71-79.
- KUKKIWON. (2018). The statistic status of taekwondo blackbelt holder. *Statistics and policy issue*. Hyper link: [<http://www.kukkiwon.or.kr/front/kor/information/report.action?cmd=View&seq=187&pageNum=1&searchKey=1&searchVal=>]. Retrieved on 20 May 2020.
- LAKES, K.D. & HOYT, W.T. (2004). Promoting self-regulation through school-based martial arts training. *Journal of Applied Developmental Psychology*, 25(3): 283-302.
- LEE, H.S. (2009). Taekwondo training through trained sociality of children with mild developmental disability. Unpublished master's thesis. Seoul, South Korea: Korea National Sport University.
- MAHY, J.; SHIELDS, N.; TAYLOR, N.F. & DODD, K.J. (2010). Identifying facilitators and barriers to physical activity for adults with Down Syndrome. *Journal of Intellectual Disabilities Research*, 54(9): 795-805.
- MAZUREK, M.O.; KANNE, S.M. & WODKA, E.L. (2013). Physical aggression in children and adolescents with Autism Spectrum Disorders. *Research in Autism Spectrum Disorders*, 7(3): 455-465.
- MERRIAM, S.B. (1998). *Qualitative research and case study applications in education: Revised and expanded from "case study research in education."* ERIC Number: ED415771.
- MYERS, B.A. & PUESCHEL, S.M. (1991). Psychiatric disorders in persons with Down Syndrome. *Journal of Nervous and Mental Disease*, 179(10): 609-613.
- ORTENBURGER, D.; WASIK, J.; GORA, T.; TSOS, A. & BIELIKOWA, N. (2017). Taekwondo: A chance to develop social skills. *Do Movement for Culture. Journal of Martial Arts Anthropology*, 17(4): 14-18.

- PETERSON, W.E., SWORD, W.; CHARLES, C. & DICENSO, A. (2007). Adolescents' perceptions of inpatient postpartum nursing care. *Qualitative Health Research*, 17(2): 201-212.
- TADESSE, M.E. (2016). Benefits and challenges of practicing Taekwondo to adolescents in Addis Ababa city, Ethiopia. *Revista de Artes Marciales Asiáticas* (trans.: *Asian Martial Arts Journal*), 11(1): 1-17.
- TADESSE, M.E. (2017). Martial arts and adolescents: Using theories to explain the positive effects of Asian martial arts on the well-being of adolescents. *Ido Movement for Culture. Journal of Martial Arts Anthropology*, 17(2): 9-23.
- TSIMARAS, V.K. & FOTIADOU, E.G. (2004). Effect of training on the muscle strength and dynamic balance ability of adults with Down Syndrome. *Journal of Strength and Conditioning Research*, 18(2): 343-347.
- VERTONGHEN, J. & THEEBOOM, M. (2010). The social-emotional outcomes of martial arts practise among youth: A review. *Journal of Sports Science Medicine*, 9(4): 528-537.
- WHITE, S.W.; OWALD, D.; OLLENDICK, T. & SCAHILL, L. (2009). Anxiety in children and adolescents with Autism Spectrum Disorders. *Clinical Psychology Review*, 29(3): 216-229.
-

Corresponding author: Dr. Minjoon Ji; **Email:** chanhoji@kyungnam.ac.kr

(Subject editor: Prof. Maya van Gent)

