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Integrating Mental Skills into a Physical Activity Program for Children and Adolescents with Intellectual Disabilities

Intégration des capacités intellectuelles à un programme d'activité physique pour les enfants et les adolescents ayant une déficience intellectuelle

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Abstract

Past studies have found physical activity (PA) programs can be effective in promoting mental skills; however, no research has examined a PA program that incorporates mental skills training for children and adolescents with intellectual disabilities (ID). The purpose of this study was to examine the potential benefits experienced by children and adolescents with ID as they engaged in a 6-week PA and mental skill routine-based program. Participants included four children and adolescents aged 8-15 with ID, and their mothers. Mental skills training was integrated into existing PA program activities to enhance young people's confidence, focus, and anxiety management. Data were collected through parent interviews, parent questionnaires, and the researcher's field notes, and examined through content analysis. Results highlight themes related to confidence, focus, and anxiety management, as well as participants' enjoyment of gym sessions and ongoing challenges. Findings suggest mental skills training in a PA setting should be further examined as an alternative therapy for young people with ID.

Résumé

Même si, dans le passé, des études avaient conclu que les programmes d'activité physique (AP) pouvaient enrichir les capacités intellectuelles (CI), aucune ne s'était penchée sur un programme d'AP intégrant la formation axée sur les capacités intellectuelles à l'intention des enfants et des adolescents ayant une déficience intellectuelle. La présente étude visait donc à examiner les bienfaits éventuels d'un programme routinier de six semaines axé sur l'activité physique et les capacités intellectuelles pour des enfants et des adolescents ayant une déficience intellectuelle. Le groupe de participants réunissait quatre enfants et adolescents de 8 à 15 ans ayant une déficience intellectuelle et leurs mères. Intégrée aux programmes d'éducation physique existants, la formation axée sur les CI avait pour objet d'accroître la confiance en soi des jeunes, d'améliorer leur concentration et de les aider à mieux gérer leur anxiété. Les données ont été recueillies à l'aide des entrevues menées avec les parents, des questionnaires

administrés aux parents et des notes d'observation des chercheures. Ces dernières ont ensuite procédé à des analyses de contenu. Les résultats ont fait ressortir des thématiques associées à la confiance en soi, à la concentration et à la gestion de l'anxiété, ainsi que le plaisir que tiraient les participants des séances d'AP et les défis chroniques qui se posent. Ces résultats portent à croire qu'il faudrait explorer plus à fond le recours à la formation axée sur les CI dans des contextes d'AP comme mode alternatif de thérapie pour les jeunes ayant une déficience intellectuelle.

Introduction

In recent years, much emphasis has been placed on the important role of physical activity (PA) in promoting children's healthy physical, emotional, social, and intellectual development. PA involvement in childhood has been associated with improved cardiovascular fitness, weight control, muscular strength, flexibility, and health in later adolescence and adulthood (e.g., Powell, Thompson, Caspersen, & Kendrick, 1987). It has also been suggested that through active play, children learn skills of co-operation, compromise, self-regulation, awareness, and empathy (Burdette & Whitaker, 2005). In addition, youths' involvement in PA has been positively correlated with academic performance in numerous studies (e.g., Dwyer, Sallis, Blizzard, Lazarus, & Dean, 2001). However, past research has also highlighted the importance of suitable PA programs for children. For example, many sport programs are developmentally inappropriate, poorly organized, or over-structured, and for this reason may hinder a child from experiencing positive developmental outcomes (Danish, Forneris, Hodge, & Heke, 2004; Fraser-Thomas, Côté, & Deakin, 2005). As such, it is important that a safe and enjoyable play environment is established for young people in order for them to feel comfortable (Kien & Chiodio, 2003).

Physical Activity for Children and Adolescents with Disabilities

Appropriately structured and designed PA programs are particularly important for individuals with ID. While young people with disabilities are often motivated to participate in PA and interact with peers, they may lack the skills to do so. Further, low self-esteem is common among young people with disabilities (Siegel, 1995) as these individuals often experience daily stressors such as an inability to maintain control of a situation and apprehension regarding their future (Siegel, 1995); consequently, they may become discouraged, shy away from their current activities, and avoid other familiar tasks. For these reasons, it is important that PA environments for children with ID be positive to help ease the frustrations and anxieties that young people may have (Grosshans & Kiger, 2004). However, Murphy, Carbone, & the Council on Children with Disabilities (2008) report children with disabilities are greatly limited in their ability to participate in leisure activities such as PA due to the lack of opportunities available. Researchers in the field are generally in agreement that PA for children with disability not only has the potential to help improve their physical health (i.e., cardiovascular function, weight management, muscular endurance and flexibility), but to also optimize their overall well-being (i.e., confidence, social interaction, and positive attitude; Durstine, Painter, Franklin, Morgan, Pitettie, & Roberts, 2000).

A growing body of research has examined inclusion of individuals with disability in physical education classes with findings suggesting that full inclusion is a realistic objective provided instructors and professionals are well educated about young peoples' disabilities and how to adapt the physical education curriculum or physical activity program to meet their needs; appropriate adaptations include modifying rules in team sports (i.e., allowing two hands to dribble), using softer balls for safety precautions (i.e., Nerf balls), and allowing students with disabilities to have partners to assist them (Block, 2000). While such research has advanced understanding of how to improve the physical development of young people with disabilities, much less research has examined how other forms of adaptive PA can improve psychological and social development.

Children and adolescents in the present study were diagnosed with three specific ID: Down Syndrome, Autism Spectrum Disorder, and Attention Deficit Hyperactivity Disorder (ADHD); as such, we briefly highlight some of the current research relating to young persons with these specific disabilities and their development through PA. Children with Down Syndrome have been shown to engage successfully in PA, however they are often limited by their poor motor skills (Voleman, Visser, & Lensvelt-Mulder, 2007). Heller, Hsieh, and Rimmer (2004) found that adults with Down Syndrome who took part in a fitness and health education intervention program displayed significant improvements in their perceived ability to exercise properly, their attitudes, and their life satisfaction, as well as a decreased perception of cognitive and emotional barriers. There is a significant lack of research in regards to Autism and the role of PA (Pan & Frey, 2006); however, Pan and Frey (2006) suggested that benefits of PA reported by the general population can also be assumed in individuals with Autism (e.g., increased self-confidence, a greater sense of happiness). With regard to ADHD, 30-50% of children have been found to have coordination problems (Gillberg, 1998; Kadesjo & Gillberg, 1998); however the examination of motor coordination specifically in PA settings has gone widely overlooked in the literature on young people with ADHD (Fliers et al., 2008).

Mental Skills Training with Children and Adolescents

Mental skills refer to the mental abilities an individual develops to cope with challenges in a productive manner (Bull, Albinson, & Shambrook, 1996). Terry Orlick's (2000) Wheel of Excellence is a mental skills framework based on a lifetime of research and applied experience among individuals who successfully apply mental skills in their lives. The framework proposes seven critical components necessary to achieve individual success. The foundational core (or inner) elements of commitment, confidence, and focused connection allow the individual to better understand their personal goals. The four outer elements of positive imagery, distraction control, ongoing learning, and mental readiness allow the individual be better prepared to achieve the tasks, goals and performance that will allow them to be successful. While this mental skills framework originated from research in sport contexts, it has been successfully applied and adapted in a variety of other contexts including the workplace, and has also been found effective across age groups (Orlick, 2000).

Past research has used mental skills training to teach children positive mental skills such as those included in the Wheel of Excellence (e.g., Gilbert & Orlick, 2002; Orlick, 2002). Specifically, mental skills training has been associated with improved relaxation, decreased anxiety, improved concentration, improved ability to overcome distractions, increased capability to cope with stress, and an improved level of self-confidence among children. Gilbert and Orlick (2002) suggest that having a child develop mental skills can greatly enhance the way the child perceives themselves and their abilities. Specifically, these skills can strengthen the child's ability to have a positive outlook, which will help them better cope with stressors, and consequently improve their quality of life. However, Gilbert and Orlick (2002) outline that many children are never taught positive mental skills, which can indirectly have a negative impact on their lives.

Physical Activity and Life Skills Among Children and Adolescents with Disabilities

While an extensive literature search did not yield any research specifically examining mental skills interventions in PA settings among children and adolescents with ID, related research has looked at the effectiveness of PA programs in promoting certain broader life skills among children with disabilities. For example, Sterba, Rogers, Frances, and Vokes (2002) examined an 18-week recreational horseback riding program as an effective means of sport therapy for 17 children with cerebral palsy; while not a direct objective of the study, parents noted that their children showed improvements in self-confidence, emotional well-being, and verbal communication. Further, Jobling,Virji-Babul, and Nicholas' (2006) study highlighted that dance could be used to allow children with Down syndrome to better understand their own movements and better express themselves through movement, and that combining dance with language skills (i.e., direction, body parts) may lead to increased confidence and independence. In another study, Grenier, Rogers, and Iarrusso (2008) studied a child with Down Syndrome who participated in an adapted physical education adventure program; the child gained a sense of belonging, developed improved communication with peers, and showed a greater sense of confidence when completing progressively more difficult tasks.

Rationale and Purpose

Past literature has suggested that PA is particularly important for children and adolescents with disabilities, given the physical, motor, cognitive, and social limitations they may experience. While much research has focused on the physical benefits that PA can offer young people with disabilities, studies examining psychological and social development have been limited. PA appears to offer a ripe environment for teaching mental skills to children and adolescents with disabilities. As such, the purpose of this study was to integrate a 6-week mental skills training program into a routine-based PA program for children and adolescents with ID, and explore young peoples' experiences of confidence, focus, and anxiety management.

Method

Context

This study was conducted in a well-established adaptive gym program in a large city in Ontario, Canada. The adaptive gym program allowed children and adolescents with intellectual and/or physical disabilities to engage in structured PA programs, with one-on-one interactions with instructors. Instructors were educated on the children and adolescents' conditions as well as appropriate adaptations for these specific conditions (e.g., Block, 2000). More specifically, instructional modifications (e.g., teaching style, method of communication, level of difficulty) and equipment use (e.g., beginner trampoline with minimal bounce versus traditional trampoline) varied across children and adolescents. Further, instructors encouraged movement modifications based on individuals' skill and coordination levels. While all participants had similar pre-established PA routines, activities performed by each participant varied depending on ability and interest, and consequently, instructors' rules and expectations varied for each participant. The program encouraged positive experiences through PA while focusing on improving children and adolescents' abilities to follow instructions and routines, improve gross and fine motor skills, and develop social skills. The program took place in one of two different environments: some children and adolescents worked in a fitness centre with gym machinery such as a treadmill, a rowing machine or stationary bicycle, while others worked in a fully equipped gymnastic centre with trampolines, large mats, and a monkey bar apparatus. The program ran through the school year session (October to June) with an optional summer session (July and August). The frequency of children and adolescents' PA sessions varied; however, most engaged in the program once or twice a week for 45 minutes to one hour.

Participants

Participants included eight individuals: four children and adolescents who were enrolled in the adaptive gym program (C1-4) and their mothers (M1-4). The brief description of each program participant below is based on data collected through the parent questionnaires described below, and completed prior to the study. C1 was an 8-year old female with Down Syndrome. She was able to verbally communicate her needs, but could engage in only minimal conversation. When she was familiar with a task, she had a good level of confidence, and would complete tasks with assistance; however when attempting new skills, she struggled with her confidence, and the completion of tasks. She also had a fear of heights, which often created challenges in completing tasks. C2 was a 15-year old male with Autism who was enthusiastic to engage in conversation. When he was familiar with activities, he was very confident, and able to successfully complete activities with minimal assistance; however, he struggled to deal with changes in his daily routines. C3 was an 8-year old male diagnosed with both Autism (Pervasive Development Disorder - Not Otherwise Specified; PDD-NOS) and ADHD. He had well developed conversation skills and an extensive imagination; however, he had difficulties maintaining focus and energetic outbursts made it difficult for him to complete activities successfully. C4 was a 7-year old male diagnosed with Autism. He had underdeveloped verbal skills, struggled to maintain focus, and required a high level of supervision. C4 was athletic and energetic about completing weekly activities; however, he often

placed himself in high risk situations, as he did not appear to have awareness or comprehension of danger. All children and adolescents provided informed assent to participate in the study; all mothers provided informed consent for their own participation, as well as on behalf of their children. Ethics approval was attained by the affiliated university's Human Participants Review Committee and conformed to the standards of the Canadian Tri-Council Research Ethics Board.

Integration of the Mental Skills Program

The integration of the mental skills component into the existing PA program occurred from January to March 2008. The location and duration of each weekly PA session was pre-established. C2 engaged in his session at the fitness centre, while C1, C3, and C4 had their sessions at the gymnastic centre. C1 had a 45-minute session, whereas C2, C3 and C4 had a one hour session.

Parent questionnaires. Prior to the integration of the mental skills program, parents completed a questionnaire. The purpose of this questionnaire was to help the primary researcher gain a more comprehensive understanding of each child and adolescent's strengths and challenges from a psychological and social perspective, while also to ensure that the primary researcher made appropriate adaptations to meet the needs of each participant throughout the 6-week period. Sample questions included: (a) What are your child's physical and mental strengths? (b) Describe your child's focus when he/she is learning a new skill. (c) What are your child's social strengths? It is important to note that the intent of the questionnaire was not to gain a pre-program measurement of children and adolescents' mental skills, but rather to provide critical information to the primary researcher, in order for her to optimally design the mental skills program for each child and adolescent.

Mental skill activities. The mental skill activities were conceptualized and developed prior to the start of the study based on the Wheel of Excellence framework (Orlick 2000), previous effective interventions (e.g., Orlick, 1995), the researchers' knowledge and experience, and information received about each participant through the parent questionnaires; activities were further modified and adapted throughout the 6-week program based on the individuals' responses to each activity. The mental skills activities were designed to increase participants' confidence and focus and to help them better manage their anxiety. The means in which the mental skill activities were integrated into the PA program varied depending on the participant. Generally, as participants learned how to apply a mental skill in their activity, they would be further challenged to attempt a more advanced mental skill and/or physical activity. While mental skills were taught in the adaptive gym setting, participants were encouraged to use the same skills throughout the week in their daily living. Sample mental skill activities are described below.

To increase confidence and focus, participants were encouraged to set goals. Past research suggests goal setting is associated with improved performance (Burton, 1993) while recent work by Danish and colleagues (e.g., Forneris, Danish & Scott, 2007) has found goal setting interventions to be effective in helping adolescents better understand the importance of goal setting, and how to set specific personal goals to increase goal achievement. Similar to past interventions, goal setting activities in the current study involved encouraging participants to develop their own manageable personal goals so that they felt

invested in their goal; however, the primary researcher helped to guide participants to set goals that were attainable and realistic so that they would not become discouraged if their expectations were not met (Julien, 2002). For example, at the start of each session participants were asked what activity they wanted to "do a good job in"; this allowed participants to have a consistent focus in mind for the duration of their session. Further, participants were encouraged to set a desired goal before starting a new task. Throughout the 6-week program, participants' goals gave them something to strive for, and offered them a sense of accomplishment when they achieved them.

Also to increase participants' confidence and manage anxiety, the primary researcher consistently framed dialogue positively. This facilitated young people's positive thinking as they began a new task, or became discouraged. For example, when talking to a participant, the primary investigator would say, "You are going to do a good job on the trampoline!" versus "Are you going to do a good job on the trampoline?" The primary researcher also aimed to increase confidence by encouraging participants to contribute their ideas and inputs, and promoting autonomy among participants (Burnett, 1996; Butler, 1981; Ellis, 1976; Meichenbaum, 1977).

Other mental skill activities used to increase focus and decrease anxiety included relaxation and imagery. Given that relaxation is often difficult for individuals with ADHD (Stück, Reschke, Tanjour, Hartwig, Enke, Kuhn, & Breiter, 2002), breathing exercises were done when participants seemed to become agitated or overwhelmed. "Santa Clause Belly" or "Jelly Belly" (Orlick, 1995) involved a large inhalation and slow exhalation to help the participants calm down and regroup. Past research highlights that imagery has been successfully used to facilitate both motivational and cognitive aspects of skill learning and performance in sport and PA settings (e.g., Daw & Burton, 1994; Hall & Rodger, 1989). In this study, both forms of imagery were used. For example, at times participants were asked to close their eyes and imagine completing a task or a component of a task successfully; other times they were encouraged to take on the role of a "character" such as a superhero, which motivated them to complete a skill.

Parent interviews and researcher field notes. At the end of the 6-week program the primary researcher conducted semi-structured interviews with parents. Interviews were conducted with parents rather than program participants, given participants' varying levels of cognitive functioning, coupled with the assumption that parents were more likely to offer a realistic and unbiased portrayal their child's progress over the 6-week period. Interview questions were developed from the primary objectives of the study, and as such, focused on children's progress in the areas of confidence, focus, and anxiety management. Sample questions included: "In the last six weeks have you noticed any change in your child's behaviour?" "Have you noticed any change in your child's confidence in the past 6 weeks?" "Have you noticed any changed in your child's focusing skills in the past 6 weeks?" Interviews with mothers ranged from 45 minutes to one hour and were conducted either in participants' homes or at a coffee shop or restaurant without the children present. Data triangulation was used throughout the 6-weeks, as the primary research kept detailed field notes which documented each participant's progress and achievements, as well as their

difficulties and changes in behaviour; these notes were completed immediately after each child's session each week.

Analysis

Parent interviews were analysed through content analysis, following previously established guidelines (Côté, Salmela, Baria, & Russell, 1993; Patton, 2002; Tesch, 1990). Parent interviews were digitally reordered and transcribed verbatim and read extensively with meaning units being highlighted and 'tagged' with appropriate terms. Meaning units were in turn grouped into themes, and themes organized into five categories. A deductive approach to analysis was used given the study's focus on key outcomes (i.e., confidence, focus, and anxiety management); however, an inductive approach was also used to allow additional themes to emerge from the data. A secondary researcher, a professor with extensive experience conducting qualitative research, independently reviewed transcripts and deduced similar findings as the primary researcher, with a high level of inter-rater reliability. Any discrepancies between findings were discussed until a consensus was reached on appropriate procedure. Field notes were carefully analysed in a similar fashion, and were used as a source of data triangulation, to compliment or extend the findings deduced from the parent interviews. Given that the study's small sample (i.e., n = 4 program participants), analysis did not reach saturation, however this was seen as appropriate given the exploratory nature of the study.

The Primary Researcher

As in any qualitative research, it is important to outline the position of the primary researcher. The primary researcher started working with the adaptive gym program 16 months prior to the start of the study. She had worked with C2 and C3 for the entire 16-month period and had worked with C1 and C4 for three months prior to the start of the study. At the time that data was collected, she was an upper level undergraduate student in kinesiology and health science, familiar with the disabilities of each of the participants involved in the study; she had been educated to work with individuals with disabilities through course work, job training, and practical experience. This position was very beneficial as it facilitated the ease with which she developed a rapport with the participants prior to the start of the study, and provided her with a more comprehensive understanding of her participants as she designed and implemented the mental skills program. It should be noted however that this position could also have led to some predispositions, selective perceptions, and/or biases.

Results

Five main categories emerged from the data: confidence, focus, relaxation, enjoyment, and ongoing challenges. Table 1 displays an overview of the themes that emerged within each category and includes the total number of meaning units for each theme and the total number of parents that commented on that theme.

Table 1
Summary of Results: Categories and Themes

Category	Theme	# Meaning Units	# of Parents
1. Confidence	1. Increased independence and determination	9	3
	2. Improved confidence in relationships and social interactions	6	3
	3. Improved confidence in other activity contexts	6	3
	4. Improved confidence in gym sessions	3	2
2. Focus	1. Improved focus in quality of life and daily living skills	14	3
	2. Improved focus in gym sessions	5	3
	3. Improved focus in other leisure activities	4	3
	4. Improved focus in school and school work	2	2
3. Relaxation	1. Reduced stress from mental skills training	3	3
	2. Reduced stress from PA	3	2
	3. Improved relaxation in daily living	3	2
4. Enjoyment	1. Enjoyment of gym sessions	9	4
	2. Enjoyment of PA	2	2
5. Ongoing challenges	1. Challenges in daily living activities	3	3
	2. Challenges in academic settings	2	2

1. Confidence

1. Increased independence and determination. Three mothers discussed their child acquiring a greater level of independence and determination throughout the program. This independence was also highlighted in the primary researcher's field notes.

M2 stated:

> He wants to do that [kind of stuff], and depending on what it is I'll definitely let him do it. I am training him, well not training him - okay training him is the word – to go get the mail. The mail key house is around the corner, and I time him – you know whatever. But that's a huge step. He is just thrilled beyond belief – 'Can I go get the mail? Can I go get the mail?' (...) I'm really nervous about it, but he's got to learn to do this kind of stuff by himself.

Consistent with M2's comments, the primary researcher observed a greater level of independence in C2 throughout the program. In week 6 the following was noted, "C2 wanted to complete his 5-minute stationary bike ride alone in the small room. I allowed him to do so as I watched him through the glass wall. C2 completed this task successfully in a mature manner."

> M1 also commented on her child's determination to complete a desired task: The gym - I can see that she - that she really doesn't get as frustrated as she used to. So I can see that she kinda really tries to do that task. Whatever task that you guys are doing at that time - which is nice - she won't give up as easily. And um – at home, she still doesn't give up as easily (...). (M1)

Similarly, the following was stated by the researcher in week 4: "C1 was very focused and determined in wanting to lift her feet off from the mat on her own without any assistance. After several minutes she gained the confidence to lift her feet away from the mat."

2. Improved confidence in relationships and social interactions. Three mothers noted positive changes in how their child interacted in social settings and other personal relationships. Mothers noted that their children appeared to be more talkative with others and more interactive in social environments. M3 stated: "...I mean overall he's just in general improving. He's more talkative, creative - but I don't know what to attribute that to." M4 also stated: "I find him a little more interactive if you can believe it. But yeah, a little more chatty, a little more."

3. Improved confidence in other activity contexts. Three mothers also discussed how their child showed an increased level of confidence in other activities outside of the gym during the six-week PA and mental skills building program. In particular, they discussed how children exhibited improvements in such activities as swimming, playing video games, and working at school.

> Her swimming has gotten a lot better. She'll go with her instructor into the deep end and will be all fine. It's really really come along. (...) She has gained a lot of confidence in the water, which is really good. (M1)

4. Improved confidence in gym sessions. Participants exhibited enhanced self-confidence in the gym throughout the program. Improvements were noted in their confidence in strength and balance activities, as well as their overall approach to activities. The following quote outlines M1's views of her child's improvements in gym sessions:

> C1 has gained a lot of confidence with her body and movements. She is able to take her time to learn her moves in gymnastics. She is not as afraid to try something new. Her balance has come along. She is getting stronger.

Similar points regarding C1 were highlighted in week 6 in the field notes:

> C1 was able to walk across the split beam with no hesitation. She approached the activity with confidence and did a good job completing the task (...). When C1 got to the high bars, she climbed right up onto the circular mat [three feet high] and did a great job. C1 put her arms up above her head to hang on to the bar. She didn't struggle or state that she was afraid and couldn't do it [as she did during the first weeks of the study].

2. Focus

1. Improved focus in quality of life and daily living skills. Three parents discussed their child's ability to maintain an improved level of focus while engaging in different activities such as dressing independently, interacting and comprehending others, judging one's self- efforts, showing patience, demonstrating listening skills, and general behaviour. M4 stated:

> Ah, a little bit better [with his focus], a little better, a little bit more patient. (...) I know he's been very well behaved, yeah for you. [Laughs] (...) I find that he is actually listening a little bit more. (...) You know, even if we are getting out of the car, like before I was never really sure where he would go, but lately he's been like waiting or he'll go into the house actually, or the garage.

2. Improved focus in gym sessions. Three mothers discussed their child's improved ability to focus during gym sessions. For example, M3 stated, "Mentally he is showing more focus – a challenge in that noisy room." M4 also noted her child being able to better listen to instructions, complete a desired task without becoming distracted, and behave appropriately (i.e., not running off):

> In the gym like every Friday for sure [I see improvements with his focus] (...) I notice he still kinda points – like he still kinda wants to take off a little bit. (...) He hasn't run away from you guys and I think part of what keeps him interested too is you kinda have him going through the [obstacle course] (...) – that kinda movement keeps his interest I think. (M4)

3. Improved focus in other leisure activities. Three mothers also discussed their child's improved focus in other leisure activities such as playing on the computer, playing video games, and reading. Mothers suggested this improved focus also led to increased interest in these particular activities.

4. Improved focus in school and school work. Two mothers discussed changes in their child's ability to concentrate at school or while doing school related work (i.e., homework). When speaking about her child's level of attention at school, M3 stated, "Um in the class (...) their attention is graded [by the teacher] daily for us, so lately there are some [attention scores] that are higher. I've noticed that."

3. Relaxation

1. Reduced stress from mental skills training. Three mothers discussed their child's ability to relax during weekly gym sessions. In particular, parents noted that their child responded well to different breathing techniques: "No, he seems more relaxed, cause I think you're also doing different things [breathing

exercises] with him that he is responding to. So I think he is better, definitely" (M3). These comments were supported by observations made in field notes:

> C3 was very hyper and not focusing. I took him aside to do some cupping [breathing technique] on his back and he really enjoyed it. After that he was calmer and we headed over to the trampoline and he did a good job.

2. Reduced stress from PA. Two mothers spoke of their child's reduced stress and attributed it to the PA of the gym sessions. For example, M2 saw PA as a helpful means for her child to better cope with daily stressors: "I think the program you guys do - I've always thought that [it] reduces a lot of the stress for him. It's good for him to burn some of that off." (M2)

3. Improved relaxation in daily living. Two parents suggested their child was more relaxed throughout the course of their day. For example, M4 stated, "More relaxed, yeah. Not bouncing off the walls as much (...) He hasn't been as jumpy."

4. Enjoyment

All four mothers discussed their child's enjoyment of the program and program activities.

1. Enjoyment of gym sessions. All mothers made a point of emphasizing that their child really looked forward to their weekly gym session. For example, M1 stated, "She does enjoy the program. She knows when it's Friday – and that's gymnastics, and if we don't go she'll get upset [laughs]." M2 stated, "He loves to come to visit the gym!" M4 claimed that in comparison to the other programs her child was involved in, this form of PA therapy was the most enjoyable for her son. She suggested her child finds the gym session "fun" and does not relate to it as "work" as he does with the other therapies he partakes in.

2. Enjoyment of PA. Two mothers also noted the "trickle down" effect of the program in their child's enjoyment and engagement in PA outside of their weekly gym sessions. For example, M1 stated "Oh yeah! [She likes being physically active] – and it's good for her (...)"

5. Ongoing Challenges

While parents primarily highlighted improvements in the areas of confidence, focus, and relaxation during the course of the study, parents also outlined ongoing challenges in these areas.

1. Challenges in daily living activities. Three mothers discussed ongoing challenges in children's daily routines - whether it be learning to tie their shoes, learning to apply deodorant, or being able to sleep through the night without interruptions.

> No, his focus [challenges] are not academic. I mean we did that up until last – grade seven and eight. Like if I build another pioneer village I'm gonna die – like he doesn't care, you know? I'm much more interested in him learning to brush his hair. Can you comb it back? And he doesn't get that. I mean it took me a year to teach him to put deodorant on. I started before he was nine - before he needed it. And you lift up your arm, up and down, up and down. So I wouldn't say anything. We would do that for months and months and then one day you don't say anything. 'Put your deodorant on' - And he didn't lift his arm up and he was putting it on his shoulders. [Laughs] Okay? So we are still working on this! (M2)

2. Challenges in academic settings. Further, two mothers spoke about ongoing struggles at school in regards to confidence when completing specific tasks or with certain lessons. For example, M4 stated, "But depending on the type of task... like if he finds it overwhelming then he'll just be like 'Get me outta here! Get me away from here!'" (M4).

Discussion

The purpose of this study was to integrate a 6-week mental skills training program into a routine-based PA program for children and adolescents with ID, and explore young peoples' experiences of confidence, focus, and anxiety. The present study was the first to explore the potential benefits of a mental skills program within a PA program among children and adolescents with disabilities. The PA context provided a positive learning environment for the participants to improve their confidence levels, focus skills, and anxiety management. Data suggests participants experienced improvements in their confidence by showing more independence and improved social interactions as they engaged in activities within and outside gym sessions. Participants' ability to maintain focus in daily living skills, gym sessions, schooling environments, and during leisure activities were also noted. Further, participants used relaxation to reduce stress and anxiety, and displayed enjoyment during gym sessions and other forms of PA. Overall, parents and the primarily researcher noted participants becoming more interactive in their environments and displaying greater levels of confidence and focus not only during gym sessions, but also in their daily lives.

Confidence

Findings of this study support previous work done by Grenier et al. (2008) and Jobling et al. (2006) where children with Down syndrome reported improved confidence following a PA program. In the current study, confidence was demonstrated through improved independence and determination with respect to wanting to complete challenging activities during weekly gym sessions, and in showing an interest in doing activities alone without any assistance or supervision. This was also a common finding in Heller et al.'s (2004) study in which adults with Down syndrome participated in an educational and PA program and demonstrated increased levels of self-efficacy. In the current study, participants were in an environment that continually required them to re-evaluate their ability in completing specific activities.

The current study also promoted autonomy by allowing the children and adolescents to have input into each weekly session, whether by determining the order they wanted to do their activities, how many repetitions/sets they wanted to do for a particular exercise, or what they needed to do in order to complete an activity (e.g., how to position their body to climb a tall mat). Allowing the participants to be involved in their PA routine may have helped to increase their overall levels of confidence, as they saw their suggestions being viewed as important, and saw themselves as active contributors during their sessions. These findings support Deci and Ryan's (1985) Self-Determination Theory and Cognitive Evaluation Theory, theories that highlight the basic desire for competence and autonomy, and suggest that both characteristics must be present in order to further develop an individual's intrinsic motivation (Fisher, 1978; Ryan, 1982).

Focus

Imagery was one of the primary mental skills used to enhance focus among participants in the current study. Past research in sport and PA has found that imagery can serve both cognitive and motivational functions (i.e., to help individuals learn skills and set positive mental states to better perform; Hausenblas, Hall, Rodgers, & Munroe, 1999). Further, it has been suggested that through imagery, children are better able to perfect and understand their movements (Li-Wei, Qi-Wei, Orlick, & Zitzelsberger, 1992). In the current study however, the adaption of imagery techniques posed challenging for some. For example, when attempting to do imagery with C2, she was asked to close her eyes and imagine herself reaching her arms in the air. She quickly became irritated and forcefully stated that she could not see with her eyes closed and they had to stay open. Other participants also failed to grasp the imagery component of the study. A possible explanation for this may be due to the abstract nature of imagery. While C3 was also unsuccessful in using imagery, the exercise was modified to include positive role play. This modification proved effective, as C3 would take on the role of a turtle and complete his activities successfully. Interestingly, this modification was further enhanced when C3 was given a plush toy turtle; C3 described his turtle as being a "hard-worker that always does a good job and is well behaved." Having a meaningful tangible object to hold, that represented optimal behaviour, may have assisted C3 in staying focused while engaging in the activities. The positive results of the imagery modification noted in this study should not be dismissed, and further studies should investigate whether additional modified techniques may allow for successful use of imagery among these populations.

Positive dialogue was another technique used to facilitate focus among participants. Past literature suggests self-talk can effect a person's thoughts about their own capabilities and skills, and consequentially, effect their behaviours (Burnett, 1996; Butler, 1981). The participants in the current study often displayed negative self-talk patterns by making comments such as "I can't do it. I don't know how," or "I can't do it. I'm scared." Due to the children's limited vocabulary and comprehension, it was not feasible to ask them to elaborate on their statements. In a study performed by Manning (1990) it was suggested that self-talk patterns exhibited by students with weak verbal and language skills were more negative in nature compared to those of students who displayed higher verbal and language skills. As such, the primary researcher re-directed negative comments by participants in a positive and encouraging manner. Participants responded well to such positive dialogue as they appeared to be better focused, able to complete tasks with minimal struggle, and more confident in their abilities. These findings support past work by Burnett (1996) who highlighted the important role of significant others such as parents and teachers in influencing children's self-talk patterns. As such, it may be important that significant others use more positive dialogue, so children and adolescents have more positive self-talk patterns, which may in turn improve their focus and beliefs about their capabilities.

Relaxation

Breathing exercises (i.e., Santa Claus Belly; Orlick, 1995) appeared to have helped participants relax and refocus if they became anxious. However, past

research has highlighted that children and adolescents with ADHD often seem to struggle with relaxation exercises. For example, Stück, et al. (2002) found that the TREY-C (Training of Relaxation with Elements of Yoga for Children), a relaxation and stress management program which incorporates yoga and imagery, was not particularly effective, as children and adolescents would often misbehave, be disruptive, fall asleep, or completely disengage from relaxations exercises. Similarly, in the current study, C3 (diagnosed with ADHD) struggled when completing breathing exercises and would often misbehave instead of completing the task. As such, the primary researcher modified the relaxation exercise, and found that C3 responded better if he was taken aside to a low volume area of the gymnastic center, was spoken to in soft tones, and was asked to count to a given number (i.e., 30). C3 would repeat this counting activity until he was calm, and then sit for 1-2 minutes to mentally regroup before resuming his gymnastic activities, a technique that also turned out to be successful with other participants in the study. In sum, findings suggest that both breathing exercises and additional regrouping exercises have the potential to help relax and decrease anxiety among children and adolescents with disabilities in PA programs.

Limitations and Future Directions

Given the current study was exploratory in nature it is important to discuss the study's limitations and potential directions for further research in this area. First, in any study, there is the possibility of researcher bias; however, the primary researcher used multiple data sources (i.e., questionnaire, interviews, observation field notes) and data analysis strategies (i.e., inter-rater reliability) to limit this possibility. While having an independent researcher conduct interviews and record field notes would have helped eliminate some level of bias, it was nonetheless seen as beneficial for the primary researcher to conduct interviews, as she had gained mothers' trust, which was critical for their disclosing of information about their children. On a related note, bias due to the Hawthorn Effect (i.e., participants demonstrating behaviour change because of their increased awareness that their behaviours were being examined) could also be seen as concerning; however, this effect was likely limited given that the program participants were so familiar with the primary researcher. While this study highlights the potential of behaviour change through mental skills programs, further investigation is necessary to better understand how mental skills training can be integrated in adaptive PA programs and to determine if similar results would have been observed if the study were conducted by an individual less familiar to child and parent participants.

Second, given certain research design limitations (i.e., short duration of the mental skills program, small number of diverse participants) this study offers only preliminary conclusions regarding the effectiveness of the integration of mental skills into a PA program and transferability of findings. Future research should build on the current findings to examine overall effectiveness through a rigorous intervention model which would include pre- and post- measures of mental skills, in addition to systematic observation throughout the intervention. Further, longitudinal designs including follow-up assessments would be beneficial to better determine whether changes in behaviour can be learned and maintained over time, particularly in relation to the individuals' use of mental skills in other daily activities. It would also be beneficial to examine if the

benefits of specific mental skills activities may vary depending on the disabilities of the participants, and if a mental skills program with children and adolescents with disabilities is equally effective in a group setting as it is in a one-on-one setting. Further, investigation of whether specific traditional mental skills such as goal-setting and self-talk, or certain modified skills such as role-playing can facilitate improvements in areas of ongoing challenges, would be of interest. Finally, further research is necessary to examine the benefits of a mental skills program in different contexts (i.e., outdoor, aquatic, academic), which could in turn lead to the integration of mental skills into curricular programming.

In sum, this study made important advancements in understanding the potential positive role of integrating a mental skills program into a PA program to facilitate the confidence, focus, and anxiety management among children and adolescents with ID. While much work has focused on the potential of PA programs in facilitating positive physical development among young people with disabilities (e.g., Block, 2000) this study made a unique contribution to understanding children and adolescents' psychological and social development through an integrative mental skills – PA program. Further, the study found the Wheel of Excellence (Orlick, 2001) to be an appropriate framework to teach mental skill training to children and adolescents with ID, thus suggesting a need for further investigation using this framework among disability populations. The current exploratory study provides a solid foundation for future explorative and intervention research using mental skills in PA and other settings.

References

Block, M.E. (2000). *A teacher's guide to including students with disabilities in general physical education (2nd ed.).* Baltimore, MD: Paul H. Brookes Publishing Co.

Bull,S.J., Albinson, J.G., Shambrook, C.J. (1996). *The mental game plan: Getting psyched for sport*. United Kingdom: Sport Dynamics.

Burdette, H.L., & Whitaker, R.C. (2005). Resurrecting free play in young children: Looking beyond fitness and fatness to attention, affiliation, and affect. *Archives of Paediatrics and Adolescent Medicine,159*,46-50.Retrievedfrom http://www.childrenandnature.org/uploads/Burdette_LookingBeyond.pdf

Burnett, P.C. (1996). Children's self-talk and significant others' positive and negative statements. *Educational Psychology, 16*, 57-67. doi: 10.1080/0144341960160105

Burton, D. (1993). Goal setting in sport. In R.N. Singer, M. Murphy, & L. K. Tennant (Eds.), *The handbook of research on sport psychology*. New York, NY: MacMillan.

Butler, P.E. (1981). *Talking to yourself: Learning the language of self-support.* San Francisco, CA: Harper and Row.

Côté, J., Salmela J., Baria, A., & Russell, S. (1993). Organizing and interpreting unstructured qualitative data. *The Sport Psychologist, 7*, 127-137. Retrieved from http://journals.humankinetics.com/tsp-back-issues/tspvolume7issue2june/organizingandinterpretingunstructuredqualitativedata

Danish, S., Forneris, T., Hodge, K., & Heke, I. (2004). Enhancing youth development through sport. *World Leisure, 3*, 38-49. Retrieved from http://www.mendeley.com/research/positive-youth-development-through-sport/

Daw, J., & Burton, D. (1994). Evaluation of a comprehensive psychological skill training program for collegiate tennis players. *The Sport Psychologist, 8*, 37-57. Retrieved fromhttp://journals.humankinetics.com/tsp-back-issues/tspvolume8issue1march/evaluationofacomprehensivepsychologicalskillstrainingprogramforcollegiatetennisplayers

Deci, E.L., & Ryan, R.M. (1985). *Intrinsic motivation and self-determination in human behaviour*. New York, NY: Plenum.

Durstine, J.L., Painter, P., Franklin, B.A., Morgan, D., Pitettie, K.H., Roberts, S.O. (2000). Physical activity for the chronically ill and disabled. *Sports Medicine, 30*, 207-219. Retrieved from http://www.ovid.com/site/catalog/Journal/612.jsp

Dwyer, T., Sallis, J.F., Blizzard, L., Lazarus, R., & Dean, K. (2001). Relationship of academic performance to physical activity and fitness in children. *Paediatric Exercise Science, 13*, 225-237. Retrieved fromhttp://www.sparkpe.org/wp-content/uploads/2010/03/Relation-of-Academic-Performance-to-P-A-and-Fitness-in-Children.pdf

Fisher, C.D. (1978). The effects of personal control, competence, and extrinsic rewards systems on intrinsic motivation. *Organizational Behavior and Human Performance, 21*, 273-288. doi: 10.1016/0030-5073(78)90054-5

Fliers, E., Rommelse, N., Vermeulen, S.H.H.M., Altink, M., Buschgens, C.J.M., Faraone, S.V., Buitelaar, J.K. (2008). Motor coordination problems in children and adolescents with ADHD rated by parents and teachers: Effects of age and gender. *Journal of Neural Transmission, 115*, 211-220. doi: 10.1007/s00702-007-0827-0

Fraser-Thomas, J.L., Côté, J., & Deakin, J. (2005). Youth sport programs: An avenue to foster positive youth development. *Physical Education & Sport Pedagogy, 10*, 19-40. doi: 10.1080/ 174089042000334890

Forneris, T., Danish, S., & Scott, D.L. (2007). Setting goals, solving problems, and seeking social support: Developing adolescents' abilities through a life skills program. *Adolescence*, 42, 103-114. Retrieved from http://web.ebscohost.com.proxy.cc.uic.edu/ehost/pdfviewer/pdfviewer?sid=0308994f-b101-4227-87a3-6b3247e03788%40sessionmgr110&vid=2&hid=123

Gilbert, J., & Orlick, T. (2002). Teaching skills for stress control and positive thinking to elementary school children. *Journal of Excellence, 7*, 54-66. Retrieved from http://www.zoneofexcellence.ca/Journal.html

Gilchrist, L.D., Schinke, S.P., & Maxwell, J.S. (1987). Life skills counselling for preventing problems in adolescence. *Journal of Social Service Research, 10*, 73-84. Retrieved from http://journalseek.net/cgi-bin/journalseek/journalsearch.cgi?field=issn&query=0148-8376

Gillberg, C. (1998). Chromosomal disorders and autism. *Journal of Autism and Developmental Disorders, 28*, 415-425. doi: 10.1023/A:1026004505764

Grenier, M., Rogers, R., & Iarrusso, K. (2008). Including students with Down syndrome in adventure programming. *The Journal of Physical Education, Recreation and Dance, 79*, 30-35. Retrieved from http://www.highbeam.com/JOPERD--The+Journal+of+Physical+Education,+Recreation+~A~+Dance/publications.aspx

Grosshans, J., & Kiger, M. (2004). Identifying and teaching children with learning disabilities in general physical education. *The Journal of Physical Education, Recreation and Dance, 75*, 18-20, 58. Retrieved from http://www.highbeam.com/JOPERD--The+Journal+of+Physical+Education,+Recreation+~A~+Dance/publications.aspx

Hall, C.R., & Rodgers, W.M. (1989). Enhancing coaching effectiveness in figure skating through a mental skills training program. *The Sport Psychologist, 3*, 142-154. Retrieved from http://journals.humankinetics.com/tsp-back-issues/tspvolume3issue2june/professionalpracticesenhancingcoachingeffectivenessinfigureskatingthroughamentalskillstrainingprogram

Hausenblas, H., Hall, C., Rodgers, W., & Munroe, K. (1999). Exercise imagery: It's nature and measurement. *Journal of Applied Sport Psychology, 11*, 171-180.doi: 10.1080/ 10413209908404198

Heller, T., Hsieh, K., & Rimmer, J.H. (2004). Attitudinal and psychosocial outcomes of a fitness and health education program on adults with Down syndrome. *American Journal on Mental Retardation, 2*, 175-185. doi: 10.1352/0895-017(2004)<175:AAPOOA>2.0.CO;2

Jobling, A., Virji-Babul, N., & Nicholas, D. (2006). Children with Down syndrome: Discovering the joy of movement. *The Journal of Physical Education, Recreation and Dance, 77*, 34-54. Retrieved from http://www.highbeam.com/JOPERD--The+Journal+of+Physical+Education,+Recreation+~A~+Dance/publications.aspx

Julien, K. (2002). Mental skills training for children and young athletes. *Journal of Excellence, 7*, 67-75. Retrieved from http://www.zoneofexcellence.ca/Journal.html

Kadesjo, B., & Gillberg, C. (1998). Attention deficits and clumsiness in Swedish 7-year-old children. *Developmental Medicine & Child Neurology, 40*, 796-804. doi: 10.1111/j.1469-8749.1998.tb12356.x

Kien, L.C., & Chiodo, A.R. (2003). Physical activity in middle school-aged children participating in a school-based recreation program. *Archives of Paediatrics & Adolescent Medicine, 157*, 811-815. Retrieved from http://archpedi.ama-assn.org/cgi/reprint/157/8/811.pdf

Li-Wei, Z., Qi-Wei, M., Orlick, T., & Zitzelsbergers, L. (1992). The effect of mental-imagery training on performance enhancement with 7-10-year-old children. *The Sport Psychologist, 6*, 230-241. Retrieved from hhttp://mailer.fsu.edu/~kiw05/is_research/modules_fr/Li-Wei_1992_Effect_of_mental-imagery_training.pdf

Manning, B.H. (1990). A categorical analysis of children's self-talk during independent school assignments. *Journal of Instructional Psychology, 17,* 208-217. Retrieved from http://www.questia.com/library/jp-journal-of-instructional-psychology.jsp?CRID=jp_journal_of_instructional_psychology&OFFID=se1jp&KEY=journal_of_instructional_psychology

Meichenbaum, D. (1977). *Cognitive-behaviour modification: An integrative approach*. New York, NY: Plenum Press.

Murphy, N.A., Carbone, P.S., & the Council on Children with Disabilities. (2008). Promoting the participation of children with disabilities in sports, recreation, and physical activities. *American Academy of Paediatrics, 121,* 1057-1061. doi:10.1542/peds.2008-0566

Orlick, T. (1995). *Nice on my feelings.* Carp, Ontario, Canada: Creative Bound.

Orlick, T. (2000). *In pursuit of excellence*. Champaign, Illinois, USA: Human Kinetics

Orlick, T. (2002). Nurturing positive living skills for children: Feeding the heart and soul of humanity. *Journal of Excellence*, 7, 86-98. Retrieved from http://www.zoneofexcellence.ca/free/kids/01_Nurturing_Positive_L.pdf

Pan, C., & Frey, G.C. (2006). Physical activity patterns in youth with autism spectrum disorders. *Journal of Autism and Developmental Disorders, 36,* 597-606. doi:10.1007/s10803-006-0101-6

Patton, M.Q. (2002). *Qualitative research and evaluation methods.* Thousand Oaks, California: Sage Publications.

Powell, K.E., Thompson, P.D., Caspersen, C.J., & Kendrick, J.S. (1987). Physical activity and the incidence of coronary heart disease. *Annual Reviews Public Health, 8*, 253-287. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/3555525

Ryan, R.M. (1982). Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology, 43,* 450-461. Retrieved from http://www.apa.org/pubs/journals/psp/index.aspx

Siegel, H.S. (1995). Stress, strains and resistance. *British Poultry Science, 36,* 3-22. Retrieved from http://www.ingentaconnect.com/content/tandf/cbps

Sterba, T., Rogers, B., France, A., & Vokes, D. (2002). Horseback riding and children with cerebral palsy: effect on gross motor function. *Developmental Medicine and Child Neurology, 44,* 301-308. Retrieved from http://www.wiley.com/bw/journal.asp?ref=0012-1622

Stück, M., Reschke, K., Tanjour, I., Hartwig, K., Enke, J., Kuhn, J., & Breiter, K. (2002). Children's relaxation training program using elements of Yoga and imagery: Practical application and the first evaluation of curriculum: A train the trainer study. In K. Engel (Eds). *Journal of Meditation and Meditation research*. New York, NY: Peter Lang Publishing.

Tesch, R. (1990). *Qualitative research types and software tools.* New York, NY: Falmer Press.

Volman, M., Visser, J., & Lensvelt-Mulder, G. (2007). Functional Status in 5 to 7 year-old children with Down syndrome in relation to Motor ability and performance mental ability. *Disability and Rehabilitation, 29,* 25-31. doi: 10.1080/09638280600947617

World Health Organization (1990). *Healthy child development.* Retrieved from http://www.who.int/social_determinants/themes/earlychilddevelopment/en/index.html