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Graduate Studies

PERCEPTIONS OF PARENTS OF STUDENTS WITH DOWN SYNDROME

REGARDING PHYSICAL EDUCATION PROGRAMS

A Manuscript Style Thesis Submitted in Partial Fulfillment of the Requirements for the  
Degree of Master of Science in Exercise and Sport Science

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College of Science and Health  
Adapted Physical Education Teaching

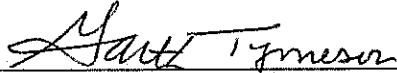
August, 2017

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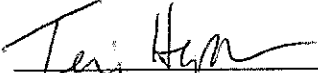
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We recommend acceptance of this thesis in partial fulfillment of the candidate's requirements for the degree of Master of Science in Exercise and Sport Science-Physical Education Teaching-Adapted Physical Education Teaching Concentration.

The candidate has completed the oral defense of the thesis.

  
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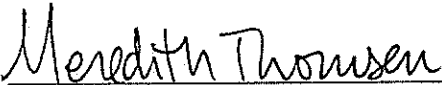
  
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## ABSTRACT

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Research indicates many barriers to health enhancing physical activity for students with Down syndrome (DS). In addition, low levels of fitness and motor skills are documented along with high incidence of obesity among those with DS. There is a lack of research regarding parent perceptions of their child's physical education program. An online survey examined parent perceptions of their child's physical education program. Questions included demographics and inquiries about the child's physical education program. Results indicated that only 58.3% of students with DS had physical education on their IEP and only 50% of IEP meetings had physical education teacher representation. The most common current and preferred physical education placement among parents was a combination of both general and adapted physical education and least common was general physical education without assistance. Parents were least satisfied with communication from their child's physical education teacher and most satisfied with their child's physical safety in physical education. Emotional/social skills were found to be the greatest benefits of physical education and sport-specific skills the lowest. Significant differences were found regarding the overall physical education program and satisfaction with the child's paraeducator if physical education was on the IEP.

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## TABLE OF CONTENTS

	PAGE
ABSTRACT.....	iii
ACKNOWLEDGEMENTS.....	iv
TABLE OF CONTENTS.....	v
LIST OF TABLES.....	vii
LIST OF APPENDICES.....	viii
INTRODUCTION .....	1
METHOD .....	7
Participants.....	7
Operational Definitions.....	8
Development of the Survey .....	9
Perceptions of Parents of Children with Disabilities Regarding Physical Education and School-Sponsored Extracurricular Sport.....	9
Pilot Study.....	10
Distribution of Surveys.....	11
Statistical Analysis.....	11
RESULTS .....	13
Research Question One.....	13
Research Question Two .....	16
Research Question Three.....	17
Research Question Four.....	20
DISCUSSION.....	22
Physical Education Information on the IEP.....	22
Parent Perceptions of Child’s Physical Education Program.....	27
Parent Perceptions of Physical Education for Children with DS.....	29
Inclusion of Physical Education on IEP Influencing Parent Perceptions .....	33
Implications.....	34
Limitations .....	37
Suggestions for Future Research .....	39
CONCLUSION.....	41

REFERENCES .....	43
APPENDICES .....	45

LIST OF TABLES

TABLE	PAGE
1. Physical Education Content on the IEP.....	13
2. Current and Preferred Physical Education Placements.....	14
3. Frequency of Physical Education Discussion at IEP Meetings.....	15
4. Frequency of Presence of APE and/or GPE Teacher at IEP Meetings.....	15
5. Degree of Satisfaction with PE Program, Safety, and Teacher Communication...	16
6. Degree of Importance of Physical Education.....	17
7. Priority Rankings of Physical Education Content Areas.....	18
8. Parent Rankings of Physical Education Benefit Categories.....	19
9. Means and Standard Deviations of Parent Satisfaction Based on IEP Status.....	20
10. Parent Perceived Importance of Physical Education Based on IEP Status.....	21

LIST OF APPENDICES

APPENDIX	PAGE
A. Institutional Review Board Research Approval Letter.....	45
B. Online Survey: Perceptions of Parents of Children with Disabilities Regarding Physical Education and School-Sponsored Extracurricular Sport.....	47
C. Email Cover Letter to Participants.....	56
D. Review of Related Research Literature.....	58

## INTRODUCTION

Down syndrome (DS), also known as trisomy 21, is a genetic condition resulting from the presence of an extra copy of chromosome 21 (Skallerup, 2008). Down syndrome is the most common chromosomal disorder and affects approximately 6,000, or 1 in 700, infants born annually in the U.S (Parker et al., 2010). Over the years, there has been an increase of children born with DS (Shin et al., 2009). Research by Cunniff et al. (2001) related this increase to the national trend of later child bearing, with women over 35 years of age being five times more likely than younger women to have children with DS.

There are three types of DS: nondisjunction, translocation, and mosaicism. Nondisjunction, which makes up approximately 95% of persons with DS, is the failure of one pair of chromosomes to separate evenly during meiosis. Translocation, which describes approximately 4-5% of the DS population, occurs when the whole 21<sup>st</sup> chromosome, or part of it, breaks off during meiosis and attaches to another chromosome. Mosaicism is the least common form of DS and affects approximately 1% of the DS population. Mosaicism occurs when the individual has some cells with the typical number of chromosomes and some cells with an extra chromosome 21, totaling 47 chromosomes (Skallerup, 2008).

Children and adolescents with DS possess a set of physical, social, and cognitive attributes that predispose them to limitations in physical fitness and physical activity capacities (Pitetti, Baynard, & Agiovlasitis, 2013). Additionally, individuals with DS

commonly experience significant delays in developmental milestones such as early gross motor development (ie., standing and walking). Common characteristics of persons with DS, that may attribute to these developmental delays, include muscle hypotonia (low muscle tone), immaturity of the central nervous system, poor postural control, and poor balance (Pitetti, et al., 2013). Pitetti et al. (2013) also suggested that these characteristics, in turn, may lead to decreased physical activity, lower aerobic capacities, lower peak heart rates, and decreased muscular strength. Motor development delays, in addition to an intellectual disability, can act as barriers to participation in physical activity, especially as individuals with DS get older, directly impacting their ability to learn new skills, activities, and games (Pitetti et al., 2013).

While most students with DS receive special education services (Wajuihian, 2016), these individuals can benefit from inclusive classroom settings where they participate with their nondisabled peers (Buckley, Bird, Sacks, & Archer, 2006). Students receiving special education must have an Individualized Education Program (IEP), which is a written statement for a child with a disability that includes the child's present levels of performance, measureable annual goals and objectives, evaluation methods, and dates for initiation and completion of special education and related services (U.S. Department of Education, 2006). According to the Individuals with Disabilities Education Act (IDEA 2004), it is required that students with disabilities receive physical education services and these services should be specially designed (or adapted) if necessary.

Students with DS are often taught by an adapted physical education (APE) teacher in a general physical education (included with nondisabled peers) or adapted physical education setting. Kelly (2006) defines APE as a program "designed to develop physical

and motor fitness; fundamental motor skills and patterns; and skills in aquatics, dance, and individual and group games so that the individual with a disability can ultimately participate in community-based physical activity programs to enjoy an enhanced quality of life. Adapted programs generally have the same goals and objectives as general physical education, but are modified when necessary to meet the unique needs of an individual". Adapted physical education teachers assist in writing IEP goals for gross motor skill and physical fitness development and learning objectives which align with the general education curriculum (An & Goodwin, 2007). In addition, APE teachers aim to develop transferability of skills from physical education classes to the community for lifelong health and physical well-being (Russell, 2005).

While developing and maintaining proper physical fitness levels for persons with DS is challenging, it is also a critical aspect of their health and well-being. A study by Carmeli, Barchad, Masharawi, and Coleman (2004) examined the effects of a treadmill walking program for adults with DS, ages 55-70 years. Each member of the walking group had a history of vascular disease. After 15 weeks of participation in the walking program, individual walking capacity increased significantly and pain levels were reduced in all participants. Participants also stated that they enjoyed the treadmill walking program. This research highlights the importance of providing persons with DS physical activities they enjoy and, as a result, they are more likely to continue participation long-term for health-enhancing benefits (Carmeli et al., 2004).

Many children with DS encounter barriers that make it difficult to participate in physical education or physical activity. One barrier is the physical limitations of persons with DS (Menear, 2007). Menear (2007) states that individuals with DS typically have

low fitness levels despite data that indicate physiological gains from physical activity and exercise interventions. Menear (2007) goes on to suggest that low fitness levels and obesity in individuals with DS may be related to sedentary lifestyles, lack of social and physical recreational opportunities, or low motivation to be physically active. This research also showed a connection between parent support and child participation in physical activity. It is possible that sedentary influences on overall health of individuals with DS are related to parental or caregiver support (Menear, 2007). Other barriers to physical education or physical activity for persons with DS include intellectual and motor delays, safety concerns, and instruction that limits participation within physical education or community-based physical activity (Alesi & Pepi, 2015; Barr & Shields, 2011; Pitetti et al., 2013; Russell, 2005).

There is a lack of research about the influence of parent perceptions of physical education programs for their children with DS. However, research has been conducted regarding the barriers to physical activity in APE programs for students with other disabilities. An and Goodwin (2007) identified barriers to physical education when researching perceptions of APE experiences among mothers of students with spina bifida. Barriers to physical activity identified by mothers included lack of proper communication by APE teachers regarding important information, and parental perceptions of inappropriate adaptations to meet their child's needs. Additional perceived barriers included limited participation of individuals with spina bifida in some activities due to safety concerns, as well as parental feelings of lack of influence on school-based physical activity.

It has also been reported by parents that there were not many opportunities outside of school, which limited their child's physical activity (An & Goodwin, 2007). According to Russell (2005), because of the many barriers to physical education for students with disabilities, "parent expectations toward their child's transition from home to school and from school to community can be fraught with uncertainty."

"Engagement in regular physical activity by children with DS is essential for their health, and not performing the recommended amount of activity may contribute to their increased risk of cardiovascular disease and obesity" (Rubin, Rimmer, Chicoine, Braddock, & McGuire, 1998). Because of the many physical activity barriers faced by children and adolescents with DS, school-based physical education plays a very important role. Adapted physical educators need to be proactive with parents in identifying a child's needs, as well as the parental expectations related to school-based instructional programs. Evaluations of parental expectations should also include perceptions of the activities and services in physical education for their children with DS. Parent-teacher collaboration may eliminate many barriers and create better opportunities for success for students with DS.

Recognizing the importance of parent influence, the purpose of this study was to examine the perceptions of parents of children with DS regarding their physical education program. The following research questions (RQ) were investigated:

RQ1: How is physical education represented in the IEP process?

RQ1a. What physical education specific information is included in the IEP?

RQ1b. What are the most common and preferred physical education placements for students with DS?

RQ1c. How is physical education represented in IEP meetings?

RQ2: What are parent perceptions of their child's physical education program?

RQ2a. To what degree are parents satisfied with specific aspects of their child's physical education program?

RQ2b. To what degree do parents perceive their child has improved on their physical education IEP goals?

RQ3: What are parent perceptions of physical education for children with DS?

RQ3a. To what degree of importance do parents of children with DS find physical education?

RQ3b. How do parents of children with DS rank physical education content areas?

RQ3c. How do parents rank the four main physical education benefit categories of social/personal skills, cognitive development, physical activity/fitness, and sport-specific skills?

RQ4: Does the inclusion of physical education on a child's IEP affect parent perceptions of physical education.

RQ4a. Is parent perceived satisfaction in their child's physical education program affected by physical education IEP status?

RQ4b. Is parent perceived importance of physical education affected by physical education IEP status?

## **METHOD**

### **Participants**

Participants of this study were parents of children with disabilities as categorized by the Individuals with Disabilities Education Act (U.S. Department of Education, 2006) between the ages of 3-26 years who attend school in the U.S. Approval for the study was granted by the UW-La Crosse Institutional Review Board for the Protection of Human Subjects prior to surveying the participants (See Appendix A).

This study was part of a larger study conducted by four graduate students from University of Wisconsin-La Crosse to determine parent perceptions of physical education and extracurricular sport programs for students with disabilities. Of the 472 participants, 359 were eliminated since they did not have a child with DS. The remaining participants were parents of children with DS (n = 113), who were from Wisconsin (n = 72), Texas (n = 7), Kansas (n = 7), Michigan (n = 6), Missouri (n = 6), Minnesota (n = 4), Illinois (n = 2), Oklahoma (n = 2), Tennessee (n = 2), Washington (n = 2), Kentucky (n = 1), New Jersey (n = 1), and Alaska (n = 1). A total of 13 states were represented in this study regarding DS. Of those who completed the survey, 97.8% of respondents were female and 2.2% were male. Age ranges of the parents were between 30 and 61 years. The majority of participants had a child with DS who was in the elementary grade level (n = 44), followed by high school or secondary transition (n = 26), preschool (n = 21), and middle school (n = 15). The majority of participants had children who were classified as White or Caucasian (n = 94) while others were Hispanic or Latino (n = 5), Black or

African American (n = 1), Asian or Pacific Islander (n = 1), Hmong (n = 1), or specified by the parents as multi-racial (n = 4).

### **Operational Definitions**

The following terms were used in this study:

**Adapted/Specially Designed Physical Education:** Adapted physical education is a program “designed to develop physical and motor fitness; fundamental motor skills and patterns; and skills in aquatics, dance, and individual and group games so that the individual with a disability can ultimately participate in community-based physical activity programs to enjoy an enhanced quality of life. Adapted programs generally have the same goals and objectives as general physical education, but are modified when necessary to meet the unique needs of an individual” (Kelly, 2006).

**Down Syndrome (DS):** Down syndrome, categorized under intellectual disability in the Individuals with Disabilities Education Act of 2004, is a genetic condition resulting from the presence of an extra copy of chromosome 21 and is the most common chromosomal abnormality, affecting approximately 1 in 700 infants born yearly in the U.S (Skallerup, 2008; Riehle-Colarusso & Oster, 2016). There are three types of DS: nondisjunction or trisomy 21 (about 95% of DS population), translocation (about 4-5%), and mosaicism (about 1%).

**Individualized Education Program (IEP):** An IEP is a written statement for each child with a disability that includes the child’s present levels of performance, measureable annual goals and objectives, evaluation methods, and the dates for initiation and completion of special education and related services (U.S. Department of Education, 2006).

## **Development of the Survey**

For this study, an online survey consisting of forced-choice questions was developed using Qualtrics. The survey was developed with another colleague who researched parent perceptions of the physical education program for students with visual impairments throughout the U.S. The survey was composed of two parts: demographics and questions about the physical education program. In the demographics section, questions were asked to determine the child's age, state/territory of residency, gender, primary disability, grade level, and ethnicity. Questions about the primary disability and state/territory were included in order to delimit the study to students with DS residing in the U.S. Two demographic questions pertaining to parental age and gender were also included.

The second section asked questions about the child's physical education program. Inquiries were made about physical education on the child's IEP, placement, parent satisfaction with specific aspects of their child's physical education program, content priorities, and perceived benefits of physical education for children with DS.

### **Perceptions of Parents of Children with Disabilities Regarding Physical Education and School-Sponsored Extracurricular Sport**

The survey consisted of 20 questions. Demographic questions were asked to determine the child's age, state/territory of residency, gender, primary disability, grade level, and ethnicity. Questions were also asked for the parent's age and gender.

Inquiries were then made to find out information regarding the child's physical education program, placement, and services. First, questions were asked about the child's IEP in relation to physical education, specifically whether physical education goals and objectives, as well as the frequency and duration of physical education instruction were

listed on the child's IEP. This part also asked parents if they felt their child improved on specific IEP goals over the last two years, how often physical education is discussed at IEP meetings, and if there was always APE or GPE teacher representation at the child's IEP meetings. Questions were then asked to determine if the child required assistance from a teacher aide or paraeducator and if so, whether the parent was satisfied with their child's paraeducator.

The next set of questions inquired about the child's current physical education placement as well as the parents' preferred placement for their child. A question was then asked regarding the satisfaction with the following aspects of the child's physical education program: emotional safety, physical safety, and communication from the GPE/APE teacher. Another question was asked to determine how important physical education was to the parents.

Parents were then asked to rank the content priorities and benefits of physical education for their child. Finally, a question was asked to determine what degree the parent was satisfied with their child's physical education program.

### **Pilot Study**

A pilot study was completed prior to the distribution of the survey. This pilot study included parents of children with DS and content experts in higher education at the University of Wisconsin-La Crosse and State University of New York-College of Brockport. Parents and professionals assisted in eliminating misunderstandings, wording errors, and unnecessary questions. Changes were made to the survey based on their feedback. Some examples of these changes included: The first two demographic questions of the original survey asked for the parents' age and gender. These questions were moved to the end of the survey because two parents in the pilot study misread the

question for their child's age and gender. Wording was also added for further clarification (i.e., "age" or "gender of person completing this survey") in parenthesis following each question. Another suggestion added two questions about paraeducators in physical education. Parents made formatting suggestions for question 18 regarding the child's current and preferred placement to make it easier to understand. Parents also made suggestions to Question 21, in which the content areas were cut from 9 to 8 choices.

### **Distribution of Surveys**

The survey was distributed via email, social media, and electronic newsletters to parents of children with DS through the following organizations in the U.S: Down Syndrome Association of Wisconsin, the National Task Group on Intellectual Disabilities and Dementia Practices, the Wisconsin Family Assistance Center for Education (FACETS), Adaptive Sports USA, Down Syndrome Guild of Greater Kansas City, Down Syndrome Association of West Michigan, Down Syndrome Association of Louisville, Down Syndrome Association of Houston, and Wisconsin Upside Down. In addition, the survey was sent to local parents whose children are involved in programs for children with disabilities through the University of Wisconsin-La Crosse or Adapted Sport Leagues in school districts in the La Crosse area. The e-mail and social media posts contained the information regarding informed consent and provided the participants with the survey link (See Appendix C).

### **Statistical Analysis**

The IBM Statistical Package for the Social Sciences (SPSS version 23.0) was used to analyze the data from the survey. Research question one required descriptive statistics to examine how physical education is represented in the IEP process by looking at frequencies and percentages. To analyze research questions two and three, descriptive

statistics were used to determine the means and standard deviations of parent experiences with their child's physical education program and their perceptions of physical education overall. Finally, independent sample t-tests were used for research question four to determine if the inclusion of physical education on a child's IEP affected parent perceptions of physical education.

## RESULTS

### Research Question One

The first research question had three parts examining how physical education was represented on the IEP. Question 1a examined what specific physical education information was included on the IEP. Table 1 shows if the following information was included on the IEP: physical education, physical education goals and objectives, the frequency and duration of physical education instruction, and if the child required a paraeducator in physical education class.

Table 1. Physical Education Content on IEP

IEP Information	Grade Level	Response		
		Yes	No	I am not sure
Physical Education on IEP	Total (n = 103)	60 (58.3)	37 (35.9)	6 (5.8)
	Preschool (n = 18)	9 (50.0)	6 (33.3)	3 (16.7)
	Elementary (n = 44)	28 (63.6)	15 (34.1)	1 (2.3)
	Middle School (n = 15)	6 (40.0)	8 (53.3)	1 (6.7)
	High School (n = 26)	17 (65.4)	8 (30.8)	1 (3.8)
Physical Education Goals and Objectives On IEP	Total (n = 103)	55 (53.4)	43 (41.7)	5 (4.9)
	Preschool (n = 18)	10 (55.6)	6 (33.3)	2 (11.1)
	Elementary (n = 44)	28 (63.6)	15 (34.1)	1 (2.3)
	Middle School (n = 15)	4 (26.7)	10 (66.7)	1 (6.7)
	High School (n = 26)	13 (50.0)	12 (46.2)	1 (3.8)
Frequency and Duration of Physical Education Instruction on IEP	Total (n = 100)	47 (47.0)	43 (43.0)	10 (10.0)
	Preschool (n = 17)	5 (29.4)	7 (41.2)	5 (29.4)
	Elementary (n = 42)	24 (57.1)	15 (35.7)	3 (7.1)
	Middle School (n = 15)	4 (26.7)	9 (60.0)	2 (13.3)
	High School (n = 26)	14 (53.8)	12 (46.2)	0 (0.0)
IEP Requirement of Paraeducator in Physical Education	Total (n = 100)	34 (34.0)	55 (55.0)	11 (11.0)
	Preschool (n = 17)	4 (23.5)	10 (58.8)	3 (17.6)
	Elementary (n = 42)	19 (45.2)	19 (45.2)	4 (9.5)
	Middle School (n = 15)	6 (40.0)	8 (53.3)	1 (6.7)
	High School (n = 26)	5 (19.2)	18 (69.2)	3 (11.5)
Frequency (Percent)				

Table 1 indicates that 58.3% of students with DS had physical education on their IEP, while 41.7% did not. The remaining 5.8% of parents were unsure if it was on the IEP. Additionally, 53.4% had physical education goals and objectives. Forty-seven percent of students had the frequency and duration of physical education recorded on their IEP, and 34.0% required a paraeducator in physical education classes.

Research question 1b examined the most common and preferred physical education placements for students with DS. Parents choose from the following four placement options: general physical education (with nondisabled peers, with assistance), general physical education (with nondisabled peers, without assistance), adapted physical education (without nondisabled peers), or a combination of general and adapted physical education. Table 2 provides the frequencies and percentages of the current physical education placements for children with DS, and parent preferred placements.

Table 2. Current and Preferred Physical Education Placements

	Current Placement	Preferred Placement
General PE (with nondisabled peers, with assistance)	27 (28.4)	33 (34.7)
General PE (with nondisabled peers, without assistance)	17 (17.9)	12 (12.6)
Adapted PE (without nondisabled peers)	23 (24.2)	10 (10.5)
Combination of both General and Adapted PE	28 (29.5)	40 (42.1)
Frequency (Percentage), n = 95		

Results showed the highest current placement for students with DS was a combination of general and adapted physical education (29.5%). Similarly, this was the

highest preferred placement, with 42.1% of parents choosing this option. The lowest current placement for students with DS was in general physical education without assistance (17.9%), while the least preferred placement was adapted physical education without their nondisabled peers (10.5%).

Question 1c pertained to how physical education was represented in IEP meetings. Table 3 shows the frequencies and percentages of physical education discussion at IEP meetings with 1 representing “never”, and 5 representing “always”.

Table 3. Frequency of Physical Education Discussion at IEP Meetings

Response	Frequency	Percent (%)
Never (1)	21	21.0%
Occasionally (2)	23	23.0%
About half of the time (3)	6	6.0%
Frequently (4)	16	16.0%
Always (5)	34	34.0%

n = 100

Table 3 indicates that 50% of parents stated that physical education was “frequently” or “always” discussed at IEP meetings, while 44% stated that it was “never” or “occasionally discussed.” Six percent of parents stated that physical education was discussed “about half of the time” at IEP meetings. Table 4 provides the frequencies and percentages of the presence of adapted and/or general physical education teachers at the child’s IEP meetings.

Table 4. Frequency of Presence of APE and/or GPE Teacher at IEP Meetings

Response	Frequency	Percent (%)
Yes	50	50.0%
No	50	50.0%

n = 100

Table 4 shows that at 50% of IEP meetings, there was no adapted or general physical education representation.

## Research Question Two

The second research question examined parent perceptions of their child's physical education program. Question 2a dealt with the degree of parent satisfaction with their child's physical education program using a 5-point Likert scale, with 1 representing "extremely unsatisfied" and 5 representing "extremely satisfied". Table 5 provides the means and standard deviations for parent satisfaction with their child's overall physical education program, emotional safety, physical safety, and amount of communication from the general or adapted physical education teacher.

Table 5. Degree of Satisfaction with PE Program, Safety, and Teacher Communication

Category	Mean	SD
Overall Program (n = 92)	3.88	1.29
Emotional Safety (n = 95)	4.08	1.19
Physical Safety (n = 95)	4.19	1.09
Communication from General or Adapted PE teacher (n = 95)	3.42	1.43

Results showed that parents were most satisfied with their child's physical safety ( $M = 4.19$ ) and emotional safety (4.08) in physical education. Parents were least satisfied with the amount of communication from their child's general or adapted physical education teacher ( $M = 3.42$ ).

Question 2b examined the degree that parents perceived their child had improved on their physical education IEP goals over the last 2 years, using a scale with 1 representing "no improvement" and 5 representing "great improvement". The mean rating from the 53 respondents to this question was 3.53, which fell between moderate and good improvement.

### Research Question Three

The third research question examined parent perceptions of physical education for their child with DS. Question 3a specifically measured parent perceptions of the importance of physical education for their child using the scale shown in Table 6.

Table 6. Degree of Importance of Physical Education

Degree of Importance	Frequency	Percent (%)
Not at all Important(1)	0	0.0%
Slightly Important (2)	2	2.1%
Moderately Important (3)	8	8.4%
Very Important (4)	34	35.8%
Extremely Important (5)	51	53.7%

n = 95

Results showed the majority of the respondents (89.5%) rated physical education as either “very important” or “extremely important.” The mean rating of the 95 respondents was 4.41 out of 5, with a standard deviation of .737.

Question 3b measured how parents of children with DS ranked specific physical education content areas. Ninety-two parents completed the priority rankings of curriculum content. The mean and standard deviation of the rankings for each of the eight curriculum content areas are shown in Table 7. Each content area is broken down by grade level of the child. The ranking scale indicates an inverse relationship with priority of the content area (1 = highest priority; 8 = lowest priority).

Table 7. Priority Rankings of Physical Education Content Areas

Content Area	Participant Grade Levels				
	Combined (n = 92)	Preschool (n = 17)	Elementary (n = 40)	Middle School (n = 14)	High School/ Secondary Transition (n = 24)
Locomotor Skills	2.92 (2.35)	1.07 (.27)	2.48 (2.06)	3.57 (2.24)	4.38 (2.62)
Object Control Skills	3.36 (1.89)	2.29 (.47)	3.20 (1.96)	3.14 (1.75)	4.38 (1.97)
Health Related Physical Fitness	2.97 (1.78)	3.43 (1.56)	3.28 (1.88)	2.36 (1.55)	2.54 (1.74)
Team Sports	4.40 (1.95)	5.00 (1.11)	4.83 (1.84)	3.79 (2.26)	3.71 (2.10)
Individual Sports	5.60 (1.56)	6.14 (.95)	5.38 (1.61)	5.29 (1.38)	5.83 (1.81)
Aquatics	4.76 (1.67)	4.00 (1.11)	4.40 (1.72)	5.00 (1.80)	5.67 (1.44)
Adventure Education/Outdoor Pursuits	6.24 (1.84)	7.07 (1.07)	6.30 (1.67)	7.00 (1.36)	5.21 (2.25)
Transition of PA into the Community	5.75 (2.38)	7.00 (1.24)	6.15 (2.28)	5.86 (2.14)	4.29 (2.60)
Mean (SD), n = 92					

Results in Table 7 showed that parents of children with DS ranked locomotor skills ( $M = 2.92$ ) and health related fitness ( $M = 2.97$ ) as the highest content priority, and adventure education/outdoor pursuits ( $M = 6.24$ ) the lowest. Specifically, parents of children at the preschool level ranked locomotor skills ( $M = 1.07$ ) and object control skills ( $M = 2.29$ ) as their highest content priorities, while ranking adventure education/outdoor pursuits ( $M = 7.07$ ) and transition of physical activity into the community ( $M = 7.00$ ) as their lowest content priorities. Similarly, parents at the

elementary school age ranked locomotor skills ( $M = 2.48$ ) and object control skills ( $M = 3.20$ ) as their highest content priorities, and adventure education/outdoor pursuits ( $M = 6.30$ ) and transition of physical activity in to the community ( $M = 6.15$ ) as their lowest. At the middle school level, parents ranked health related fitness ( $M = 2.36$ ) and object control skills ( $M = 3.14$ ) as their highest content priorities for their children, and adventure education/outdoor pursuits ( $M = 7.00$ ) and transition of physical activity into the community ( $M = 5.86$ ) as their lowest. Parents of high school or secondary transition students ranked health related fitness ( $M = 2.54$ ) and team sports ( $M = 3.71$ ) as their highest content priorities, and individual sports ( $M = 5.83$ ) and aquatics ( $M = 5.67$ ) as their lowest.

Question 3c pertained to parent rankings of four benefit categories of physical education. Table 8 shows the mean rankings, frequencies, and percentages of each benefit category. Like Table 7, the ranking scale indicates an inverse relationship with priority of the benefit category (1 = highest priority; 4 = lowest priority).

Table 8. Parent Rankings of Physical Education Benefit Categories

Benefit Category	Grade Level				
	Combined	Preschool	Elementary	Middle School	High School/ Secondary Transition
Emotional/Social Skills	1.92 (.89)	1.86 (.77)	2.03 (1.00)	1.64 (.84)	1.96 (.81)
Physical Activity/Fitness	2.05 (1.10)	2.64 (1.15)	1.98 (1.00)	2.14 (.86)	1.79 (.93)
Sport-Specific Skills	3.25 (.91)	3.07 (1.14)	3.28 (.93)	3.36 (.75)	3.25 (.85)
Cognitive Development	2.77 (1.11)	2.43 (1.16)	2.73 (1.04)	2.86 (1.23)	3.00 (1.14)
Mean (SD), n = 92					

Results in Table 8 showed that parents ranked emotional/social skills ( $M = 1.92$ ) and physical activity/fitness ( $M = 2.05$ ) as the highest benefit categories of physical education for their child with DS, while sport specific skills were ranked as the lowest benefit ( $M = 3.25$ ). When broken down specifically by grade level, all groups stayed consistent with this finding by ranking sport-specific skills as the lowest benefit category. Parents of preschool and middle school students ranked emotional/social skills as the highest benefit category, while elementary and high school ranked physical activity/fitness as the highest.

#### Research Question Four

The fourth research question determined if the presence of physical education on a child's IEP affected parent perceptions of physical education. Question 4a examined if parent satisfaction with certain aspects of their child's physical education program was affected by physical education IEP status. Table 9 shows the means and standard deviations of the satisfaction of parents based on whether or not the child had physical education on their IEP. The higher the mean, 5 representing the highest, the higher the satisfaction rate was for the parents.

Table 9. Means and Standard Deviations of Parent Satisfaction Based on IEP Status

Degree of satisfaction with specific aspects of child's PE program	Is PE on the IEP?	n	Mean	SD
Paraeducator	Yes	23	4.52	0.85
	No	10	3.60	1.43
Emotional safety	Yes	57	4.52	1.17
	No	33	3.88	1.17
Physical safety	Yes	57	4.39	1.01
	No	33	3.97	1.08
Communication from GPE or APE teacher	Yes	57	3.84	1.33
	No	33	2.85	1.30
Overall PE program	Yes	55	4.25	1.09
	No	32	3.44	1.39

Results from Table 9 showed that the means for parent satisfaction were higher for each aspect of the child's physical education program when physical education was included on the child's IEP. Additionally, there were significant differences for satisfaction with the paraeducator  $t(31) = .027, p = .017$  and overall physical education program  $t(85) = .003, p = .028$  when physical education was on the IEP.

Question 4b examined if parent perceived importance of physical education was affected by physical education IEP status. Table 10 shows the means and standard deviations of parent perceived importance of physical education based on whether or not the child had physical education on their IEP. The higher the mean, 5 representing the highest, the higher the perceived importance for the parents.

Table 10. Parent Perceived Importance of Physical Education Based on IEP Status

Category	Is physical education on child's IEP?	n	Mean	SD
Parent perceived importance of physical education	Yes	57	4.54	.63
	No	33	4.24	.87

Results from Table 10 showed that parent perceived importance of physical education was higher if the child had physical education on the IEP. However, the difference between the two was not statistically significant  $t(88) = .060, p = .125$ .

## **DISCUSSION**

The purpose of this study was to determine the perceptions of parents of children with DS regarding their child's school-based physical education program. Specifically, this study investigated physical education specific information on the IEP, parent perceptions of their child's physical education program, parent perceptions of physical education for children with DS, and whether the inclusion of physical education on IEP influenced parent perceptions.

### **Physical Education Information on the IEP**

The first research question aimed to determine how physical education was represented in the IEP process. First, physical education specific information included on the child's IEP was examined. Results revealed that only 58.3% of students with DS had physical education on their IEP, while the remaining 41.7% did not or the parents were unsure if it was on the IEP. No trends were found when this was broken down by grade level, with middle school having the lowest percentage of students with physical education on the IEP (40%). With only 15 parent respondents who had children at the middle school level, it is possible that this number does not accurately reflect the middle school DS population and that these respondents were from areas where physical education is not as progressive. In addition, it appears that as the students aged, parents became more familiar with the IEP content, with three parents of preschoolers answering "I am not sure" to this survey question and only one parent responding the same for each of the remaining grade levels.

The IDEA of 2004 states that physical education is a required part of special education and these services, specially designed if necessary, must be available to every child with a disability receiving a free appropriate public education and that students should be placed in their least restrictive environment (U.S. Department of Education, 2006). This means that if a student who qualifies for special education cannot safely and successfully participate in general physical education, they should receive specially designed or adapted physical education (Lytle, et al., 2010). Given that individuals with DS commonly experience significant delays in developmental milestones, such as gross motor development, and possess many physical, social, and cognitive attributes that predispose them to limitations in physical fitness and physical activity capacities (Pitetti et al., 2013), it should be expected that adapted physical education is included on their IEP. It is essential for parents and physical education teachers to collaborate to be sure that physical education is included on the child's IEP as part of special education.

Additionally, an IEP must include measureable goals and objectives, as well as the frequency and duration of the student's specially designed instruction (U.S. Department of Education, 2006). Out of the 60 students with DS who had physical education written on their IEP, parents stated that 55 (91.7%) of them had specific physical education goals and objectives. Five parents, however, were unsure if physical education goals and objectives were included on the IEP. No trends were shown when analyzing the data by grade level.

Forty-seven percent of parents stated that the frequency and duration of physical education services were included on their child's IEP. However, this 47% is out of the 100 respondents who completed this specific question and does not take into account

whether or not the child had physical education on their IEP. In addition, ten of the parents stated that they were unsure if it was included. It seemed that parents became more familiar with the IEP over time with 29.4% of parents of preschoolers stating that they were not sure if the frequency and duration was on their child's IEP and 0.0% of parents of high school children stating that they were not sure. The frequency and duration of physical education is essential to have on the IEP as it is required by law and holds school districts accountable to provide specially designed instruction to students with disabilities. Results show that more students need to have the frequency and duration listed on their IEP and that parents need to be educated earlier regarding this specific physical education IEP content.

Results showed that 34% of parents stated that the IEP included that the child required a paraeducator for physical education. Students at the preschool (23.5%) and high school (19.2%) grade levels required a paraeducator the least amount, while students in elementary (45.2%) and middle school (40.0%) required a paraeducator for physical education the most. It is possible that students in high school require a paraeducator less than other grade levels because they have become more independent and do not need as much additional assistance in physical education. Additionally, their nondisabled peers are also at an older age and it is more likely that there is a peer buddy system in place to assist students with disabilities in general physical education. Generally, the younger the student, the more assistance they would need in physical education. It is possible that the cause for preschool students not having a paraeducator is that the class sizes are small or one-on-one, where they may not need a paraeducator. It is also possible that the school

district does not understand that these students need the extra assistance, or parents may not realize they could request this assistance.

Next, the current and preferred physical education placements for students with DS were examined. Results showed the most reported instructional placement for students with DS was a combination of both general and adapted physical education (29.5%). Similarly, this was the highest preferred physical education placement option, with 42.1% of parents choosing the option as what they prefer for their child with DS. The lowest current placement of students with DS was in general physical education without assistance (17.9%), while the least preferred placement was adapted physical education without their nondisabled peers (10.5%). These results are supported by Menear (2007), who reported that parents of children with DS stated that their children preferred inclusive activities over adapted. This relates to the present study, where parents prefer more inclusive environments for their children, with the two most preferred placements being general physical education and a combination of general and adapted physical education. When Menear asked about extracurricular sport and activities, parents described that their children desired the socialization aspect of sports, by wanting to be included with their friends on a competitive team. Additionally, parents stated that their children were too strong physically for special needs leagues and teams and they did not want to play with modified rules or children younger than them (Menear, 2007).

It is important to include students with DS in general physical education when appropriate, since in many cases it may be their least restrictive environment. By including students in general physical education, the opportunity for the students to

socialize and play competitively with their peers significantly increases. The IDEA of 2004 requires that students with disabilities be educated with their nondisabled peers to the greatest extent possible (U.S. Department of Education, 2006). The findings from the present study support that parents also feel this way about physical education instruction.

Lastly, the extent to which physical education was represented in IEP meetings was examined by looking at the frequency of physical education discussion and presence of the adapted and/or general physical education teachers at IEP meetings. Results showed that only 50% of parents stated that physical education was “frequently” or “always” discussed at IEP meetings, while 44% stated that it was “never” or “occasionally discussed.” Six percent of parents stated that physical education was discussed “about half of the time” at IEP meetings. Additionally, results showed that only 50% of IEP meetings had consistent attendance from the child’s adapted or general physical education teachers.

Individualized Education Program meetings provide time for the special education team to collaborate and discuss a child’s progress and needs, and get parents involved in their child’s education. With 50% of students with DS not having physical education teacher representation at their IEP meetings, it is likely that there is a lack of communication between parents and physical education teachers, leaving parents minimally involved in their child’s physical education program.

These results relate to a similar study by An and Goodwin (2007) where parent perceptions of physical education experiences of children with spina bifida were examined. In that study, parents felt that they didn’t have proper communication with APE teachers regarding important information about their children. Parents expressed the

importance of IEP meetings “as a great venue for sharing information regarding the educational future of their child.” In a study by Menear (2007) regarding parent perceptions of physical education experiences for students with DS, parents stated that they felt that they had no influence on the physical activity that is received by their child during the school day. Parents provided some suggestions for APE teachers, such as more professional guidance from teachers by providing activities and illustrations for them to do at home with their children (Menear, 2007). The IEP meeting is where these discussions should take place. Physical education teachers need to attend these meetings.

With physical education as part of special education, there should always be physical education teacher representation at IEP meetings. Studies by An and Goodwin (2007) and Menear (2007) show that parents desire better communication with their child’s physical education teacher so they can work together to create a more successful learning environment and be more involved in their child’s physical education experience.

### **Parent Perceptions of Child’s Physical Education Program**

The second research question aimed to determine parent perceptions of their child’s physical education program. First, the degrees of parent satisfaction of the child’s overall physical education program, emotional safety, physical safety, and amount of communication from the general or adapted physical education teacher were examined.

Results revealed that parents were most satisfied with their child’s physical safety in physical education ( $M = 4.19$ ), and least satisfied with the amount of communication from their child’s general or adapted physical education teacher ( $M = 3.42$ ). It is very likely that the cause of this dissatisfaction with physical education teacher

communication arises from the lack of physical education teacher representation in IEP meetings with only 50% of physical education teachers of children with DS in attendance.

These results are similar to those of Columna et al. (2008), where parents of children with disabilities expressed a desire to be a part of the educational process and to have more communication with physical education teachers. The parents also found importance in adapted physical education professionals embracing and valuing parental support by including parents more in the educational process.

Results from the present study and other research (An & Goodwin, 2007; Columna et al., 2008; Menear, 2007) show that there is an apparent lack of communication between parents and adapted physical education teachers, which lead to barriers such as lack of parental involvement, knowledge of APE services, and ways to get their children involved in physical activity outside of school. Physical education professionals need to work to improve this communication gap by consistently attending IEP meetings.

Next, the degree that parents perceived their child had improved on their physical education IEP goals over the last 2 years was examined. The average rating of the 53 respondents was 3.53, which fell between moderate and good improvement. The results suggest that more can be done by physical education teachers to ensure that students with DS are improving on their IEP goals and objectives. However, it is possible that due to the apparent lack of communication between parents and physical education teachers, that parents are unfamiliar with the amount of improvement of their child within physical education, so they chose a more neutral option on the scale.

### **Parent Perceptions of Physical Education for Children with DS**

The third research question determined parent perceptions of physical education for their child with DS. First, parent perceptions of the importance of physical education for their child were measured. Results showed that parents strongly value physical education, with the majority of respondents (89.5%) rating physical education as either “very important” or “extremely important.” This suggests that parents want physical education to be a part of their child’s curriculum and therefore on the IEP. With research showing that parents value physical education and desire more communication and involvement within their child’s physical education program, it is crucial for physical education teachers to build the bridge of communication by actively participating in all IEP meetings.

Results from previous studies show that parents of children with other disabilities feel similarly about physical education. In a study where parent perceptions of children with spina bifida regarding their physical education programs were analyzed, it was found that parents valued their child’s participation in physical education and preferred to be involved in their child’s program and share information regarding physical activity modifications with the teacher (An & Goodwin, 2007). Additionally, parents recognized physical education as valuable in teaching about healthy lifestyles as an intervention to prevent obesity through physical activity. Physical education teachers should take advantage of this information by sharing ideas with parents to get involved with their child in physical activity outside of school.

Next, parent rankings of specific physical education content areas were examined by grade level. Results showed that parents of children with DS at the preschool and

elementary school level ranked locomotor and object control skills as their highest content priorities, while ranking adventure education/outdoor pursuits and transition of physical activity into the community as their lowest content priorities. This shows that parents have content priorities that align with the national standards and grade-level outcomes for physical education (SHAPE America, 2013), that indicate fundamental motor skills are essential to focus on at the preschool and elementary age levels. Additionally, parents showed their understanding that the transition of physical activity in the community is not as crucial at these particular grade levels, as students still have much time before they need to focus on transitional skills.

At the middle school level, parents ranked health-related fitness ( $M = 2.36$ ) and object control skills ( $M = 3.14$ ) as their highest content priorities for their children, and adventure education/outdoor pursuits ( $M = 7.00$ ) and transition of physical activity into the community ( $M = 5.86$ ) as their lowest. Parents of high school or secondary transition students ranked health-related fitness ( $M = 2.54$ ) and team sports ( $M = 3.71$ ) as their highest content priorities, and individual sports ( $M = 5.83$ ) and aquatics ( $M = 5.67$ ) as their lowest. Results show that as students with DS get older, health-related fitness becomes more of a priority for parents. This is likely because parents understand that obesity is very common and a potential health risk for adults with DS.

Transition of physical activity into the community became progressively more important over time, ranking third in importance for parents of children with DS at the high school/secondary transition level. At this grade level, it is crucial for physical education teachers to teach students with DS how to become as active and independent as possible within the community. This means teaching students how to utilize facilities in

community settings, such as local fitness centers and do lifelong activities such as hiking, biking, or swimming. It appears that parents valued aquatics as progressively less of a priority as the children aged. However, there are many benefits to aquatics for persons with DS and it is skill that can be utilized at all age levels and throughout adulthood. Additionally, parents of children of all age levels ranked adventure/outdoor pursuits ranked consistently low. This may indicate a lack of knowledge of the many benefits of adventure education and outdoor pursuits for students with DS.

The survey question discussed above was modified from a study by Shutt (2010) where physical education content priorities of teachers and parents of children with DS were investigated. Results demonstrated that parents, general physical education, and adapted physical education teachers all ranked locomotor skills, object control skills, health-related physical fitness, and social skills as the most important content areas in physical education for their students or children with DS. Team sports, educational gymnastics/creative movement and dance, adventure education/outdoor pursuits, and physically active video games were ranked as the lowest priority curriculum content areas by the three groups. With exception of the few categories omitted (non-locomotor skills, physically active video games, social skills, gymnastics/creative movement and dance) to create the survey question in the present study, the results are similar. Locomotor skills object control skills, and health-related fitness ranked high for parents of students with DS at all grade levels. In comparing the two studies, results show that parents, general physical education teachers, and adapted physical education teachers have similar content priorities for students with DS.

Lastly, parent rankings of four main benefit categories of physical education were examined. Results showed that parents ranked emotional/social skills ( $M = 1.92$ ) as the highest benefit category of physical education for their child with DS. When broken down by grade level, parents of preschool and middle school students similarly ranked emotional/social skills as the highest benefit category, while elementary and high school ranked it the second highest benefit, with physical activity/fitness as the highest.

Creating opportunities for positive social interactions help individuals with disabilities to enjoy participation in physical activity with their peers and can ultimately lead to lifelong physical fitness. In a similar study by An and Goodwin (2007), parents of children with spina bifida stated that physical education has many social benefits, such as creating friendships, enjoyment, sense of belonging, and self-confidence. However, the parents also expressed that because of the child's disability, there was a potential for social isolation and negative self-esteem.

In the present study, parents of children of all grade levels ranked sport-specific skills as the lowest benefit category of physical education ( $M = 3.25$ ). It was surprising to see that 51.1% of parents ranked it as the lowest benefit category. While some parents may truly value physical activity and emotional/social skills over sport-specific skills, it is also possible that parents do not recognize the many benefits of sport-specific skills. For example, if a student works on throwing and catching in physical education, it will help them gain the confidence to join a school or community-based softball or baseball program, thus creating additional opportunities for social interaction and lifelong enjoyment of physical activity.

### **Inclusion of Physical Education on IEP Influencing Parent Perceptions**

The final research question determined if the presence of physical education on a child's IEP affected parent perceptions of physical education. First examined was if parent satisfaction with certain aspects of their child's physical education program was affected by physical education IEP status. Results showed a direct relationship between physical education presence on the IEP and level of satisfaction. If physical education was on the child's IEP, parent satisfaction rates were higher for each category.

There was a significant difference in parent satisfaction with the child's overall physical education program ( $p = .028$ ) when physical education was on the IEP. The IEP meeting is an essential venue for communication between parents and teachers, where the parents are equal partners in their child's education. Additionally, IEP meetings are a time for teachers and parents to discuss goals, student progress, and share ideas to create better experiences for students. If physical education is not on a child's IEP, it is not required to have physical education teacher representation at the IEP meeting, which is likely to result in a lack of knowledge by parents about their child's physical education experience. Without physical education teacher representation, the communication between teacher and parent is limited and likely left parents feeling unsatisfied with the overall program. This should not happen in special education.

There was also a significant difference found in parent satisfaction with the child's paraeducator ( $p = .017$ ) when physical education was on the IEP compared to when it was not. The role of a paraeducator in physical education is to assist in the provision of adapted physical education services under the supervision of an adapted physical education teacher. Therefore, if a paraeducator is required for physical

education, physical education must also be on the child's IEP. When physical education is on the IEP, it is likely that parents are able to better understand what the role of the paraeducator is in assisting with their child's physical education. When physical education is not on the IEP, it can be assumed that there would be less parent-teacher communication regarding physical education, leaving parents unfamiliar with their child's physical education experience. It is also possible that parents are more unsatisfied with the paraeducator when physical education is not on the IEP because they feel their child should be receiving services from an adapted physical education teacher instead of a paraeducator, who may not be providing much physical education instruction or assistance at all. With many children with DS having motor delays and cognitive impairment, most should have physical education on their IEP, thus requiring specially designed instruction from a qualified teacher.

Next examined was if parent perceived importance of physical education was affected by physical education IEP status. Results showed that parent perceived importance of physical education was higher if the child had physical education on the IEP. However, the differences between the two were not found to be statistically significant ( $p = .125$ ). This likely resulted because when physical education is on a child's IEP, parents are more involved in their child's physical education program; therefore, more inclined to value physical education.

### **Implications**

Multiple implications for parents, adapted and general physical education teachers, school administrators, and advocates for students with DS can be drawn from this study. Information from the results will help parents, educators, and school

administrators to recognize that physical education is a required part of special education, and all students receiving special education services can benefit from physical education (U.S. Department of Education, 2006).

First, the study showed what physical education specific information needs to be included on the child's IEP, such as goals and objectives and the frequency and duration of physical education instruction. Additionally, the study showed that approximately 40% of students with DS do not have physical education on their IEP. Given that individuals with DS commonly experience significant delays in developmental milestones, such as early gross motor development, and possess many physical, social, and cognitive attributes that predispose them to limitations in physical fitness and physical activity capacities (Pitetti et al., 2013), physical education should be included on their IEP. It is essential for parents and physical education teachers to collaborate to be sure that physical education is included on the child's IEP. Parents need to be aware of and advocate for these services.

Next, in determining parent perceptions of their child's physical education program, it was found that the two highest preferred physical education placement options, making up 76.8% of parent responses, were a combination of both general and adapted physical education and general physical education with assistance from an adapted physical education teacher. However, it was found that 24.2% of students are still receiving adapted physical education without their nondisabled peers. It is important to include students with DS in general physical education when appropriate, given that in many cases it may be their least restrictive environment. In this environment, the opportunity for the students to socialize and model their peers significantly increases.

Physical education is a common instructional area for inclusion. The IDEA of 2004 requires that students with disabilities be educated with their nondisabled peers to the greatest extent possible (U.S. Department of Education, 2006). This information is crucial to help show parents, teachers, and administrators that they need to collaborate as a team to ensure that students with DS are being educated with their nondisabled peers if they can be safe and successful in that environment.

When determining parent perceptions of their child's physical education program, it was found that parents were least satisfied with the amount of communication from their child's general or adapted physical education teacher. Approximately 50% of parents stated that there is no general and/or physical education representation at their child's IEP meeting. Adapted and general physical education teachers can use these results to implement better communication with parents, such as helping them to understand the role of physical education in the IEP process, and sharing updates on their child's goals and progress.

Parent rankings of specific physical education content areas were also examined. Results showed that parents prioritized basic fundamental movement skills such as locomotor and object control skills as their highest content priorities for children at the preschool and elementary levels. As students aged, focus was placed more on health-related fitness components and team sports. However, some content areas that were not ranked as top priorities by parents, like aquatics and transitioning physical activity into the community, are extremely beneficial for individuals with DS. Aquatics is a life-long skill that is usually very accessible for individuals who have a local exercise facility membership and has many health-enhancing benefits for persons with DS. Focusing on

transitioning physical activity into the community is crucial to increase independence levels and life-long physical fitness. This information can be used by teachers to better plan for the student's needs based on what parents prioritize for their child.

Additionally, parents ranked emotional/social skills as the highest benefit category of physical education. Creating opportunities for positive social interactions helps individuals with disabilities to enjoy participation in physical activity with their peers and can ultimately lead to life-long physical fitness. The social benefits of physical education can create friendships, enjoyment, sense of belonging, and self-confidence (An & Goodwin, 2007). This is important for parents and teachers to recognize so they can advocate for children with DS to be involved with their nondisabled peers as much as possible in physical education and extracurricular sport.

Lastly, results indicated that when physical education was included on the IEP, parents' overall perceptions of their child's physical education program were significantly better. When physical education is included on the IEP, it opens the door for parent-teacher communication, where parents are team members in their child's physical education, and are much more likely to be involved in the process, leading to higher satisfaction rates. This is extremely important for parents, teachers, and administrators to note so that they can work together to get physical education on the child's IEP and have better physical education programs for school-aged students with DS.

### **Limitations**

There were several limitations in this study. One limitation was that the survey did not go through a formal validation process. However, the survey was reviewed by university faculty and parents of children with disabilities during a pilot study.

Another limitation was restricted access to parents of children with DS, particularly outside of Wisconsin. Down syndrome organizations posted the survey on social media, online parent discussion groups, and in on-line newsletters because there was limited access to parent emails. Even though 36.3% of the respondents resided outside of Wisconsin, the amount of respondents from the other states was not high enough to make meaningful comparisons.

Another limitation was that the survey question asking if physical education was on the students' IEP did not include skip logic. If the parent selected "no" or "I am not sure", they should have skipped all of the survey questions regarding physical education on the IEP such as goals and objectives, frequency and duration, paraeducator, teacher representation, and physical education discussion at the IEP meetings. If physical education is not on the IEP, this particular content would also not be on the IEP. Without this survey design oversight, data would have been gathered from only those who had physical education on the IEP, resulting in a more specific analysis of the IEP content.

An additional limitation was that some parents may not have understood disability terminology used on the survey, such as "multiple disabilities." It is possible that parents chose this as their child's primary disability without understanding the real meaning, which may have resulted in some students with DS not being accounted for in the data analysis.

Finally, some respondents mentioned that the survey did not include a "504 plan" option, which differs from an IEP. The survey was structured to assume that the child had an IEP, which is not always the case. This may have resulted in some parents of children with DS not completing the survey.

## **Suggestions for Future Research**

There is limited research regarding physical education programs for students with disabilities, especially those with DS. More research needs to be conducted to develop more effective physical education programs for students with DS. The following are suggestions for future research.

1. Compare parent perceptions of physical education programs for children with DS in different states or regions of the country. For example, compare southern states (Texas and Louisiana) to midwest states (Wisconsin and Minnesota). This research could show what areas of the country adapted physical education and/or inclusion may not be as progressive and what needs to be done to expand services.
2. Interview parents of children with DS regarding their child's physical education program. This research could gather more in depth data of how parents perceive their child's program and what they think can be done to improve programs.
3. Survey parents of children with DS to determine their knowledge of special education services including physical education and extracurricular activities. This information would show what parents know and do not know in regards to special education law including physical education.
4. Compare these results to other disabilities receiving physical education throughout Wisconsin or nationwide. This information can show the differences between parent perceptions of physical education programs between students with DS and other disabilities such as visual impairment, orthopedic impairment, or autism spectrum disorder.

5. Compare services and characteristics of students with DS who have an IEP to those with Section 504 plans. This information can show the percentage of students who have Section 504 plans instead of IEPs and help determine if students are receiving the appropriate physical education services around the country.

6. Survey parents of adults with DS about their child's physical education experiences to compare results to those of school-aged children. This information can determine the impact of physical education for persons with DS over the years.

7. Interview students or adults with DS about their physical education program and experiences. This information could provide a first-hand account of students who currently or in the past, had physical education. Additionally, this could provide many ideas for program improvement to benefit the students.

## CONCLUSION

Physical education plays very important roles in the lives of children and adolescents with DS because of the documented low physical activity levels and susceptibility to obesity (Menear, 2007). Physical education provides students with opportunities for social interaction and enjoyable physical activity for lifelong physical fitness. The importance of physical education for all students with disabilities is recognized through its inclusion in federal special education law.

Results from this study reveal that many students with DS do not have physical education on their IEP, thus resulting in not having important physical education information such as goals and objectives, and the frequency and duration of instruction. However, approximately 90% of parents stated that they highly value physical education, showing that it should be an important part of their child's education. Since physical education is part of special education, all students receiving special education services need to have physical education included on their IEP (U.S. Department of Education, 2006).

Communication among physical education teachers and parents is imperative to ensure that students have opportunities to succeed in physical education. However, results revealed that there is a lack of communication between parents and their child's physical education teachers. One can infer from these results that parents would like to be more involved in their child's physical education experiences. Physical education

teachers need to be more proactive with parent collaboration in the special education process.

It is crucial for parents, teachers, and school administrators to recognize these factors to work together in creating the most effective physical education programs for students with DS. It is hoped that parents and APE teachers will utilize the results of this study to work together to eliminate barriers for students with DS and to provide them with opportunities to live healthy and active lifestyles through quality physical education programs.

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APPENDIX A  
INSTITUTIONAL REVIEW BOARD RESEARCH APPROVAL LETTER

UNIVERSITY of WISCONSIN  
LA CROSSE

To: Mary O'Reilly

From: Bart Van Voorhis, Coordinator  
Institutional Review Board (IRB) for the  
Protection of Human Subjects  
[bvanvoorhis@uwla.edu](mailto:bvanvoorhis@uwla.edu)  
5-6892

Date: January 26, 2017

Re: RESEARCH PROTOCOL SUBMITTED TO IRB

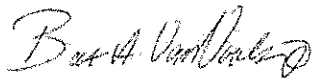
The IRB Committee has reviewed your proposed research project entitled: *"Parent Perceptions of Physical Education Programs for Students with Down Syndrome in Wisconsin."*

The Committee has determined that your research protocol will not place human subjects at risk. The attached protocol has been approved and is exempt from further review per 45CFR46, 46.101(b)(2).

However, it is strongly suggested that Informed Consent always be used. Remember to provide participants a copy of the consent form and to keep a copy for your records. Consent documentation and IRB records should be retained for at least 3 years after completion of the project.

Since you are not seeking federal funding for this research, the review process is complete and you may proceed with your project.

Good luck with your project.



cc: IRB File  
Garth Tymeson, Faculty Advisor

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APPENDIX B  
ONLINE SURVEY:  
PERCEPTIONS OF PARENTS OF CHILDREN WITH DISABILITIES REGARDING  
PHYSICAL EDUCATION AND SCHOOL-SPONSORED EXTRACURRICULAR  
SPORT

Q1. Perceptions of Parents of Children with Disabilities Regarding Physical Education and School-Sponsored Extracurricular Sport

NOTE: If your child with a disability is not between the ages of 3-26 years, please disregard this survey. You are done. Thank you for your time.

The purpose of this study is to determine parent perceptions of children with disabilities about their child's school-based physical education and school-sponsored extracurricular sport programs. When completing this survey, YMCA, Special Olympics, Paralympics, parks and recreation, and other community-based sport programs should not be considered. This survey is only about school-based/school-sponsored programs.

Participation in this study is voluntary. You may stop your participation at any time. All responses to this survey are anonymous and your identity will never be revealed. Completion and submission of this survey indicates your informed consent. Thank you for your time and participation.

Q2. In what state/territory do you reside?

Select from dropdown

Please select your state/territory from the dropdown options.

Q3. Which of the following represents your child's primary disability for school-based special education?

- Autism
- Deaf-blindness
- Deafness
- Emotional disturbance
- Hearing impairment
- Intellectual disability (without Down syndrome)
- Intellectual disability (with Down syndrome)
- Multiple disabilities
- Orthopedic impairment
- Other health impairment
- Specific learning disability
- Speech or language impairment
- Traumatic brain injury
- Visual impairment
- Other, please specify

12%  12.5%



Q5. What is your child's grade level?

- Preschool (ages 3-5)
- Elementary School (Grades K-5)
- Middle School (Grades 6-8)
- High School or Secondary transition program (Grades 9-12)

Q6. What is the gender of your child?

- Male
- Female

Q7. What is the age of your child?

Please Select from Dropdown

Age (years)

Q8. What is your child's race/ethnicity?

- White or Caucasian
- Hispanic or Latino
- Black or African American
- Native American or American Indian
- Asian or Pacific Islander
- Hmong
- Other, please specify

0%  100%

Q9.

### Questions About Your Child's Physical Education Program

**Definitions:** Please consider the following definitions when completing the survey questions.

**Adapted/Specially Designed Physical Education:** Physical education which has been adapted or modified, so that it is as appropriate for the person with a disability as it is for a person without a disability.

**Individualized Education Program (IEP):** An IEP is a written statement for each child with a disability that includes the child's present level of performance, measurable annual goals and objectives, evaluation methods, and the dates for initiation and completion of special education and related services. Physical education is part of special education.




Q10. Is physical education listed on your child's IEP?

- Yes
- No
- I am not sure

Q11. Are physical education goals and objectives listed on your child's IEP?

- Yes
- No
- I am not sure

0%  100%



Q12.

To what degree do you feel your child has improved on his/her physical education IEP goals and objectives over the last two years?

	No improvement (1)	Slight improvement (2)	Moderate improvement (3)	Good improvement (4)	Great improvement (5)
Degree of child's improvement in physical education IEP goals in last two years	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q13.

How often is physical education discussed at your child's IEP meeting?

	Never (1)	Occasionally (2)	About half of the time (3)	Frequently (4)	Always (5)
Frequency of physical education discussion at IEP meeting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q14.

Is there always an adapted and/or general physical education teacher at your child's IEP meetings?

- Yes  
 No

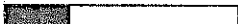
Q15.

Is the frequency and duration of your child's physical education instruction listed on the IEP? (for example: the specific number of minutes of instruction over a given number of school days; 30 minutes, 3 times a week).

- Yes  
 No  
 I am not sure

Q16. Does your child's IEP require a paraeducator/teacher aid for physical education?

- Yes  
 No  
 I am not sure

0%  100%



Q17. To what degree are you satisfied with the paraeducator/teacher aid in physical education?

	Extremely unsatisfied (1)	Somewhat unsatisfied (2)	Neither satisfied or unsatisfied (3)	Somewhat satisfied (4)	Extremely satisfied (5)	I am not sure
Degree of satisfaction with the paraeducator/teacher aid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Q18.

Answer the following questions regarding your child's physical education placement (where does your child receive physical education).

	General PE (with nondisabled peers, with assistance)	General PE (with nondisabled peers, without assistance)	Adapted PE (without nondisabled peers)	Combination of both general and adapted PE
A. What is your child's current placement?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
B. What is your preferred placement for your child?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

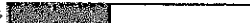
Q19.

To what degree are you satisfied with the following aspects of your child's physical education program?

	Extremely unsatisfied (1)	Somewhat unsatisfied (2)	Neither Satisfied nor unsatisfied (3)	Somewhat satisfied (4)	Extremely satisfied (5)
Emotional safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communication from general PE or adapted PE teacher	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q20. To what degree do you feel physical education is important in your child's education?

	Not at all important (1)	Slightly important (2)	Moderately important (3)	Very important (4)	Extremely important (5)
Degree of importance of physical education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8%  100%



Q21. Based on your child's current age, rank the following physical education content areas from most important (1) to least important (8). Use your mouse to click and drag the content areas. (If you do not want to rearrange these answers please click on one of the selections for the survey to recognize your response.)

- Locomotor skills (e.g., walking, skipping, hopping)
- Object control skills (e.g., catching, throwing, kicking)
- Health related physical fitness (e.g., cardiovascular endurance, muscular strength, flexibility)
- Team sports (e.g., baseball, whiffleball, soccer, basketball)
- Individual sports (e.g., tennis, martial arts, golf)
- Aquatics (e.g., swimming)
- Adventure education/outdoor pursuits (e.g., rock climbing, hiking, canoeing)
- Transition of physical activity into the community (after graduation) (e.g., going to YMCA, community recreation or fitness centers)

Q22. Rank order of the benefits of physical education for your child from most important (1) to least important (4). Use your mouse to click and drag the benefits. (If you do not want to rearrange these answers please click on one of the selections for the survey to recognize your response.)

- Emotional/social skills (e.g., communication, creating friendships)
- Physical Activity/Fitness (e.g., running/walking to maintain health)
- Sport-Specific Skills (e.g., throwing, catching, kicking)
- Cognitive development (e.g., strategies, knowledge of rules)

Q23.

Overall, to what degree are you satisfied with your child's current physical education program?

	Extremely unsatisfied (1)	Somewhat unsatisfied (2)	Neither satisfied nor unsatisfied (3)	Somewhat satisfied (4)	Extremely satisfied (5)
Degree of satisfaction with current physical education program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

0%  100%

<< >>

APPENDIX C  
EMAIL COVER LETTER

Dear Parent/Guardian:

I am a graduate student at the University of Wisconsin-La Crosse pursuing a master's degree in Adapted Physical Education (APE). I am conducting a study on the perceptions of parents of children with Down syndrome (DS) regarding their child's physical education program.

As a parent of a child with Down syndrome, please contribute to this study by completing a brief survey that should take no longer than 10 minutes. Participation in this study is voluntary and you may stop participation at any time without penalty. **All responses to this survey are anonymous and your identity will never be revealed.** Completion and submission of this survey indicates your informed consent.

Please follow the link below to the survey:

[https://uwlacrosse.qualtrics.com/jfe/form/SV\\_brZsVA6CRYeFpMF](https://uwlacrosse.qualtrics.com/jfe/form/SV_brZsVA6CRYeFpMF)

If there are any questions regarding this survey, please contact me, Mary O'Reilly, at (914) 582-5817 or oreilly.mary@uwlax.edu.

Thank you for your time and consideration. Your participation is greatly appreciated.

Sincerely,

Mary O'Reilly  
Adapted Physical Education Graduate Fellow  
University of Wisconsin-La Crosse

Garth Tymeson, PhD, Thesis Advisor  
Department of Exercise and Sport Science  
Center on Disability Health and Adapted Physical Activity  
[gtymeson@uwlax.edu](mailto:gtymeson@uwlax.edu)

APPENDIX D  
REVIEW OF RELATED RESEARCH LITERATURE

## REVIEW OF RELATED RESEARCH LITERATURE

### Introduction

Down Syndrome (DS), also known as trisomy 21, is a genetic condition resulting from the presence of an extra copy of chromosome 21 (Skallerup, 2008). According to Riehle-Colarusso and Oster (2016), DS is the most common chromosomal abnormality and affects approximately 1 in 700 infants born yearly in the U.S. It is estimated that in the U.S., 5,500 infants with DS are born annually. “It is suggested that the probable cause for the increase in DS is related to the trend toward later child bearing, with women over 35 years of age being five times more likely than younger women to have children with DS” (Pitetti, Baynard, & Agiovlasitis, 2013).

Down syndrome is a multisystem disorder that affects the individual physically and psychologically. Physical characteristics include brachycephaly (smaller head/skull shape), round face, short neck, small ears, flat nasal bridge, microgenia (abnormally small chin), macroglossia (protruding or oversized tongue), short limbs, muscle hypotonia (low muscle tone), and lax ligaments (Wajuihian, 2016). In addition, persons with DS have an increased risk for certain medical conditions, some that are congenital and others that are progressive (Wajuihian, 2016). Some of these conditions include increased risk of congenital heart disease, hearing loss, eye disease, obstructive sleep apnea, gastrointestinal condition, and hypothyroidism. Approximately half of children with DS are hospitalized before the age of 3, predominantly because of congenital heart disease and/or respiratory illnesses such as pneumonia or bronchitis (Pitetti et al., 2013).

According to Riehle-Colarusso and Oster (2016), about half of all infants born with DS also have a congenital heart defect.

Obesity is a concern for individuals with DS. In a study by Melville, Cooper, McGrother, Thorp, and Collacott (2005), the body mass index (BMI) was calculated for 247 adults with DS in Leicestershire, England. The experiment matched up each person with DS to a person with an intellectual disability (ID), who was the same gender, age, and accommodation type (inpatient unit, non-hospital, community accommodation) according to the Leicestershire database. The data showed that women with DS had a lower mean height and weight, but greater mean BMI than the matched pairs. Men with DS, also had lower mean heights and weights, but no statistical difference in BMI when compared to the matched pairs. According to the World Health Organization, women with DS were more likely than their matched pairs to have a BMI classified as overweight or obese. On the other hand, men with DS were more likely to be classified in the overweight category and were less likely to be classified as obese.

Persons with DS often have an intellectual disability which affects learning and cognition. “Most students with DS receive special education, while some can benefit from inclusive classroom settings” (Wajuihian, 2016). According to the Eligibility Criteria for Adapted Physical Education Services, special education (also referred to as ‘specially designed instruction’) meets the needs of a child with a disability with no cost to the parents. Special Education instruction includes instruction at home, hospitals, or in the classroom, as well as instruction in physical education (American Association for Physical Activity and Recreation/National Association for Sport and Physical Education, 2010).

“In 2009, the U.S. Department of Education estimated that approximately 5.8 million of the nation’s school children, ages 6 to 21 years, were receiving special education services through the Individuals with Disabilities Education Act (IDEA) of 2004” (Lytle, Lavay, & Rizzo, 2010). According to IDEA, students with disabilities are guaranteed to receive a free appropriate public education (FAPE) in the least restrictive environment (LRE). The LRE ensures that students with disabilities receive their education to the maximum extent appropriate with their nondisabled peers (Rozalski, Stewart, & Miller, 2010). Under IDEA, it is required that physical education be provided to all students who qualify for special education, regardless of their disability (Chaapel, Columna, Lytle, & Bailey, 2012). If students cannot safely and successfully participate in general physical education, they should receive specially designed or adapted physical education (Lytle, et al., 2010).

Most students with DS have an Individualized Education Program (IEP). An IEP is a written statement for each child with a disability that includes the child’s present levels of performance, measureable annual goals and objectives, evaluation methods, and dates for initiation and completion of special education related services (U.S. Department of Education, 2006). Adapted physical education (APE) teachers assist in writing IEP goals for skill development and learning objectives that align with the general education curriculum (An & Goodwin, 2007). According to An and Goodwin (2007), in addition to aligning the goals and objectives to the general education curriculum, APE teachers should also focus on learning outcomes that foster physical activity and inclusion outside of school and throughout life activities. One goal of APE teachers is to create transferability of skills from school-based physical education to physical activity within

the community. However, many families of children with disabilities encounter barriers that make it difficult for their children to participate in outside activities, such as lack of time and knowledge of how to modify activities. Because of this, “parent expectations toward their child’s transition from home to school and from school to community can be fraught with uncertainty” (Russell, 2005).

The purpose of this study was to identify perceptions of parents of children with DS regarding their child’s physical education program. This review of related literature includes the following topics: Physical Activity Levels of Individuals with Down Syndrome; Effects of Physical Education and Motor Development Programs on Persons with Down Syndrome; and Parent Perceptions and Expectations of Physical Education.

#### **Physical Activity Levels of Individuals with Down Syndrome**

“Engagement in regular physical activity by children with Down syndrome is essential for their health, and not performing the recommended amount of activity may contribute to their increased risk of cardiovascular disease and obesity” (Rubin, Rimmer, Chicoine, Braddock, & McGuire, 1998). According to the 2008 Physical Activity Guidelines for Americans, children and adolescents should do 60 minutes or more of physical activity daily (U.S. Department of Health and Human Services, 2008). A majority of children with DS are not meeting these daily recommendations of 60 minutes a day of moderate or vigorous physical activity, which is a major concern for a population that is already at risk for being overweight (Esposito, MacDonald, Hornyak, & Ulrich, 2012).

Individuals with DS typically have low fitness levels despite data that indicate physiological gains from physical activity and exercise interventions. Low fitness levels

and obesity in individuals with DS may be related to sedentary lifestyles, social and recreational opportunities, or low motivation to be physically active. Because research has shown a connection between parent support and their children's participation in physical activity, it is possible that the sedentary influences on the overall health of individuals with DS may be related to parental or caregiver support (Menear, 2007).

Shields, Dodd, and Abblitt (2009) investigated whether children with DS met the daily recommended amount of 60 minutes of moderate to vigorous physical activity. An RT3 accelerometer was used to measure physical activity of 23 participants (7 girls, 16 boys; aged 7-17 years) over 7 days. Subjects used the accelerometer and performed their normal daily routines. In addition, parents of the children with DS recorded a logbook to report if their child did not wear the accelerometer for a period of time, such as if they were bathing or swimming, or if any problems occurred with the accelerometer during the 7 days.

The average amount of vigorous physical activity that the participants completed each day was 22.9 minutes. Nine of the children performed more than 20 minutes of vigorous physical activity on 3 or more days. This activity, however, was divided throughout the day and not continuous. In terms of meeting the daily recommended amount, only 8 of these children were active for at least 60 minutes per day for all 7 days. Approximately 58% of children with DS did not perform the recommended amounts of physical activity to maintain a good health. None of the children performed the recommended level of continuous vigorous physical activity. This is important to note because continuous vigorous physical activity plays a role in enhancing cardiovascular

fitness. The data also found that there was an inverse relationship between physical activity and age. As the children aged, their physical activity levels decreased.

There was no significant relationship found regarding physical activity levels and BMI (Shields et al, 2009). The researchers concluded that parents are most likely the biggest influence on their children's physical activity habits and that families should incorporate physical activity into their daily routine as much as possible. It was suggested that all parents, teachers, and health professionals involved with caring for children with DS should incorporate strategies for increasing their physical activity levels. Parents and professionals need to teach children with DS activities that can be pursued directly into adulthood, such as swimming, dancing, cycling, and exercising at a local facility. These activities are highly recommended for persons with DS because they can be completed by individuals of all ability levels (Buckley, 2007).

In a similar study conducted by Whitt-Glover, O'Neill, and Stettler (2006), physical activity patterns in children with DS were compared to their nondisabled siblings. To do this, the physical activity of 28 children with DS and 30 siblings between the age range of 3 and 10 years was measured. For families to be eligible for this study, they had to have at least one child with DS and one sibling with no known disabilities, both between the ages of 3 and 10 years. In addition, the family had to have no history of congenital cardiac defects requiring open heart surgery, no history of gastroenterological anomalies requiring ongoing medical intervention, no history of cancer, no history of hypothyroidism, or other chronic conditions that could effect energy balance and growth. It was also required that participants have a BMI between the 5<sup>th</sup> and 95<sup>th</sup> percentile specific to their age and gender. Descriptive information (ie., weight, height, and BMI) of

the children with DS, their nondisabled siblings, and parents was collected in the initial inpatient visit in the Children's Hospital of Philadelphia.

To measure physical activity, the participants were asked to wear an Actitrac activity monitor for 7 consecutive days. Physical activity data from the Actitrac were recorded in 30-second intervals during each 24-hour period and the average activity count during each interval was stored. After the data were stored and downloaded, the activity counts were converted to physical activity intensity levels (inactivity, low physical activity, moderate physical activity, vigorous physical activity). The total number of minutes per day at each intensity level was then calculated and physical activity bout patterns were explored to determine if the children were physically active continuously or during short intervals throughout the day.

Results revealed that children with DS were heavier at a younger age than their nondisabled siblings. It was found that 93% of the subjects participated in at least 60 minutes of moderate physical activity per day, while 40% participated in at least 60 minutes of vigorous physical activity. It was also found that children participated in about 2.5 hours per day of moderate physical activity and 59 minutes per day of vigorous physical activity. Even though the children met daily recommended physical activity amounts, children with DS participated in less vigorous physical activity than their siblings and for shorter bouts of time. However, children with DS in this study participated in a similar amount of time of moderate and low intensity physical activity.

Overall children with DS in this study participated in less vigorous physical activity than their nondisabled siblings and had higher BMI levels. Whitt-Glover et al. (2006) pointed out that children with DS also have a tendency towards obesity, so

increasing participation in vigorous physical activity is a potential factor in the prevention of obesity and promotion of lifelong health.

In addition to low physical activity levels, children and adolescents with DS possess a set of physical, social, and cognitive attributes that predispose them to limitations in physical fitness and physical activity capacities (Pitetti et al, 2013). Individuals with DS commonly experience significant delays in the onset of developmental milestones, such as early motor milestones like standing and walking. These motor delays may act as barriers to physical activity participation. Some common characteristics of persons with DS that may cause delayed development are muscle hypotonia (low muscle tone), immaturity of the central nervous system, poor postural control, and poor balance (Pitetti et al, 2013). These characteristics, in turn, may lead to lower aerobic capacities, lower peak heart rates, and decreased muscular strength (Pitetti et al, 2013).

Motor delays in addition to an intellectual disability can act as another barrier to participation in physical activity, directly impacting their ability to learn new skills, activities, and games (especially as individuals with DS get older). Other barriers to physical activity for persons with DS are facility and transportation restrictions, lack of program options, and low motivation for physical activity (Pitetti et al, 2013).

As found in the study by Pitetti and colleagues in 2013, there are many barriers to physical activity in persons with DS. Barr and Shields (2011) conducted a similar study that explored both barriers and facilitators to physical activity for persons with DS. In order to determine these barriers and facilitators, 18 interviews were conducted with 20 parents of 18 children with DS between the ages of 2 and 17 years. The children had a

wide range of physical activity experiences in both formal sport settings or informal play at home, but it was mentioned by parents that their children often stopped activities out of disinterest. The parents were interviewed from 20-50 minutes by one researcher by telephone or face-to-face. All questions about barriers and facilitators to physical activity were asked as open-ended questions so that the participants could fully express their experiences and opinions.

Four main themes were identified regarding facilitation of physical activity for children with DS. The first theme was “the positive role of the family.” It was found that when parents enjoyed and recognized the importance of sport and fitness, the children were more inclined to participate in physical activity. Parents spoke about the biggest facilitator as being involved in physical activity together as a family and being a positive role model for the child.

The second theme was “opportunity for social interaction with peers.” It was found that social interaction with peers was a powerful facilitator for the children who were good verbal communicators and that for some parents this social interaction was the primary reason why their child enjoyed taking part in sporting activities.

The third theme was “structured accessible programs that make adaptations for children with DS.” Under this theme, parents expressed that programs which catered specifically to persons with DS facilitated their child’s participation. Parents suggested that this was also true for mainstream activity programs if the programs made appropriate adaptations and modifications for children with DS. It was found that dancing was the most commonly identified physical activity that children with DS participated in because it helped to “overcome shyness and increase independence.”

The last theme was “children who were determined to succeed and physically skilled.” It was found that children with DS who had certain physical skills and personality traits, such as enthusiasm, coordination, and cognitive ability to understand rules, were more likely to participate in formal activity. It was also noticed by parents that when their child enjoyed a certain activity, they rarely needed external encouragement to participate.

In contrast to facilitators, four themes of barriers to physical activity were identified for children with DS. The first theme was “characteristics commonly associated with DS.” The most common characteristics identified as barriers were more directly related to that of DS and not intellectual disability in general. These were characteristics such as hypotonia, obesity, congenital heart defects and communication impairments. Some of the characteristics, such as congenital heart defects, particularly effected young children with DS because it decreased energy and endurance. However, once the defects had been treated, physical activity levels improved. Half of the parents considered their child’s delay in communication as a barrier to physical activity as their children’s abilities to understand rules and instruction was limited. Parents also discussed their child’s low muscle tone as preventing them from doing activity with their peers.

The second theme was “competing family responsibilities.” Under this theme, parents stated that they found themselves as a barrier to their child’s physical activity participation in that they did not necessarily have the time to supervise that physical activity and that they would encourage their child to do more sedentary activities because of convenience. Parents also mentioned that they were overprotective and afraid that their child would be vulnerable in a physical activity setting.

The third theme was “reduced physical or behavioral skills.” Parents indicated that as their children got older, there was a bigger gap in physical and cognitive skills when compared to nondisabled peers. This limited their participation even more in mainstream activities. It was also stated that behavioral issues, such as noncompliance and increased frustration when engaging challenging activities were barriers to formal activities in particular.

The last theme was “a lack of accessible programs.” Parents stated that there was a lack of mainstream programs that would enroll their child. Parents expressed frustration in this area as they felt that there were preconceived ideas along with negative attitudes regarding children with disabilities and that they did not feel their child was welcome to participate.

Research states that persons with DS generally have low fitness levels and often do not meet the recommendations of 60 minutes a day of moderate or vigorous physical activity, which puts them more at risk for obesity (Esposito, MacDonald, Hornyak, & Ulrich, 2012). These low fitness levels directly correlate with the many barriers to physical activity for persons with DS, such as their physical and cognitive characteristics and lack of opportunities for physical activity (Barr and Shields, 2011). Providing quality APE teachers and programs will provide students with DS with the opportunities to be successful in physical activity and overcome barriers to increase their overall fitness levels.

## **Effects of Physical Education and Motor Development Programs on Persons with Down Syndrome**

People with DS are less likely to be active than the general population, which may contribute to the growing obesity problems in people with DS. Individuals with DS often need more motivation and assistance to regularly engage in physical activity than their nondisabled peers. Research states that individuals with DS have specific areas of need related to physical education curriculum content and all parents, teachers, and health professionals involved with caring for children with DS should incorporate strategies for increasing their physical activity levels (Shields et al., 2009).

In a study conducted by Ulrich, Burghardt, Lloyd, Tiernan, and Hornyak (2011), physical activity and health-related outcomes of teaching children with DS to ride a 2-wheel bicycle were investigated. Seventy-two children with DS between the ages of 8 and 15 years of age were enrolled and randomly assigned to either an experimental group with bicycle intervention or a control group with no intervention. Eleven children were not included in the final analysis due to parent withdrawal or attrition at follow-up. None of the participants could ride a 2-wheel bicycle at the start of the study while most parents claimed that they tried to teach their child how to ride a 2-wheel bicycle for years and were at the point of giving up. Measurements were taken for leg strength, leg balance, height, weight, skinfolds, and physical activity levels for all participant's pre-intervention, 7 weeks post-intervention, and 1 year after the pre-intervention measurement. Physical activity was assessed for 7 days with an accelerometer. This was used to sample intervals of 15 seconds. Participants wore the monitor for all activities except swimming, showering or bathing, and sleeping and were given a log to record times when the monitor was not worn.

The Lose the Training Wheels organization provided the bicycle training intervention for the participants. This consisted of 5 consecutive days of individual instruction for 75 minutes per day by trained staff with experience with children with DS. Specially engineered adapted bicycles, which were tailored to the participant's individual needs based on skill level, were provided by the organization for the training. A series of 8 roller wheels were used throughout the process to help the rider progress. For example, the first and second roller wheels allowed the riders to pedal continuously without the fear of falling. The seventh and eighth roller wheels were for the most advanced riders as their use demonstrated good balance control of the adapted bicycle.

During the training session, the floor manager observed each rider by looking at their pedaling speed, whether they were leaning into a curve, and whether the riders were beginning to relax their arms to use the handle bars for control. This evaluation helped determine if they were ready for a change in the roller wheel structure. As the training program progressed and the child's performance improved, the child received training on bicycles that progressively were more similar to the standard 2-wheel bicycle. On the final day of the program, the participants were tested to measure their success in riding a 2-wheel bicycle independently for a minimum of 9 meters.

Before conducting the intervention study, 298 families who had children with DS between the age range of 8 to 15 and lived in Michigan, Ohio, and Indiana were surveyed. Only 9.7% of the children could ride a 2-wheel bicycle. The results of the intervention study demonstrated that 56% of the total participants in the experimental group learned to ride a 2-wheel bicycle within the duration of the 5-day program.

According to the parents, none of the children in the control group (nonintervention group) could demonstrate the ability to ride a 2-wheel bicycle.

In the previous study, a bicycle intervention program was provided for children with DS to see how they improve in their ability to ride a 2-wheel bicycle within a specific period of time. A similar study was conducted by Carmeli, Barchad, Masharawi, and Coleman (2004) on the effects of a treadmill walking program for adults with DS and lower extremity arterial occlusive disease. Each member of the walking group had a history of vascular disease. The study consisted of 2 walking groups (group A) and a control group (group B). The walking groups included 14 adults (9 women, 5 men) with DS between 55-40 years of age who lived in a foster home in Israel. The first walking group (A1) consisted of 8 adults, and had no symptoms of intermittent claudication (IC), which is pain in the skeletal muscles during walking, and is the primary complaint of patients with peripheral vascular disease (Carmeli et al., 2004). The second walking group (A2) consisted of 6 participants who had symptoms of IC. The control group (group B) consisted of 12 participants from the same foster home and of similar age. Both groups had similar health and lifestyle characteristics and were all diagnosed of having a mild intellectual disability.

The purpose of the walking program was to increase the walking tolerance in older adults with DS and lower extremity arterial occlusive disease. Before each walking session, each participant started with 5 minutes of active stretching exercises, focusing specifically on the lower body. The treadmill program consisted of low endurance walking at 0% incline. The participants walked on the treadmill 3 times per week for 15 consecutive weeks, starting at 5-15 minutes of walking and then progressed to 40 minutes

as their endurance improved. The participants were guided to walk as fast as they could tolerate comfortably and at a speed just below the thresholds of pain or breathlessness. Throughout the program, the conditions were controlled and the participants always walked between the time of 9:30-11:30 a.m. Each time the participants finished walking, they sat to get their heart rate and blood pressure measured and recorded.

It was found that after 15 weeks of participation in the walking program, walking capacity increased significantly and pain levels were reduced in all participants. The participants also stated that they enjoyed the treadmill walking program. It is important to provide persons with DS with physical activities they enjoy, so they are more likely to participate and be active.

Rimmer, Heller, Wang, and Valerio (2004) conducted a similar study evaluating the effectiveness of an exercise training program for adults with DS. The population consisted of 52 persons with DS within the age range of 30 to 70 years, who had been sedentary for the past year or longer, had written permission to participate in the study by their primary physician, lived within an hour commute of the intervention site, and were able to understand instructions and complete all physiological testing. The participants were randomly selected as into the control or exercise group. The following measurements were taken for all participants in the study: fasting blood draw, resting ECG, resting heart rate, resting blood pressure, and basal temperature. Prior to the participants performing additional assessments such as peak VO<sub>2</sub>, strength, and body composition, the participants familiarized themselves with the strength and cardio equipment at the facility 3 to 4 times, as well as practiced using a mouthpiece and nose clip.

After all the participants were assessed prior to the study, the exercise group started the training program, where the participants performed cardiovascular exercise for 30-45 minutes and strength exercise for 15-20 minutes each session. The first and last 3-5 minutes of the cardiovascular exercise was used for a warm-up and cool-down. The first 2 weeks were used to teach the participants how to safely utilize the equipment and to communicate if they were experiencing unusual symptoms, such as dizziness or chest pain. During this time, the participants spent 15-20 minutes in their specific target heart rate zone. In the next two weeks, it was emphasized to spend 20-30 minutes in their prescribed heart rate zone, and by week 5, the participants were all exercising for 30 minutes in their designated training zone, which was 50-70% of their peak VO<sub>2</sub>.

Each participant received a heart rate monitor watch so they could assure that they were in the appropriate target heart rate zone. These participants were monitored by the staff members (1 staff member for every 1-3 participants). Strength training was performed at 70% of the participants' 1 repetition maximum (1-RM) for one set of 10-20 repetitions. After two successful sessions of completing 20 repetitions with the proper lifting technique, the weight was increased by 10% of the participants 1-RM. During strength training, the participants utilized equipment to perform the following exercises: the bench press, seated leg press, seated leg curl, triceps push-down, seated shoulder press, seated row, lat pull-down, and biceps curl.

When analyzing the data, it was found that 69% of the participants were obese according to their BMI measurements and an additional 17% were overweight. Pre- and post-exercise outcomes showed that the exercise program "had a significant effect on cardiovascular fitness and upper and lower body strength" (Rimmer et al., 2004). There

were many significant differences found when comparing the experimental and control groups. The experimental group showed significant improvement in cardiovascular function, strength, and body composition, while the control group showed no change or a slight improvement or decline. The greatest gains were found in upper and lower body strength, followed by cardiovascular fitness. The participants in the experimental group also had a slight, but statistically significant, loss in body weight (Rimmer et al., 2004).

The studies mentioned in this section demonstrate that physical activity programs are extremely beneficial for persons with DS in that they improve cardiovascular fitness, muscular strength, and psychomotor skills such as riding a bicycle or using exercise equipment independently. This information is extremely beneficial to parents and adapted physical education teachers as it shows that the proper programs, content, and skill progressions lead to increased psychomotor skills and overall fitness levels.

### **Parent Perceptions and Expectations of Physical Education**

As previously mentioned, there are many barriers to physical activity for students with DS, which often led to low levels of physical activity. In a study conducted by Menear (2007), parents of children with DS were interviewed about their perceptions of their children's physical activity and health needs. It was found that parents of preschoolers described their children as naturally active and encouraged physical activity to help prevent obesity. Their children's main forms of physical activity were during the school day at recess, therapy, and through activities parents provided at home. These parents stated that they felt that they had no influence on the physical activity that is received by their child during the school day. These interviewed parents showed common

themes in their desire to prevent obesity in their children and their desire for organized physical activity intervention.

The parents of elementary-aged children with DS stated that as their children got older, it was apparent that they had less of an interest in physical activity as the gap between their motor skills and the motor skills of their typically developing peers increased and the number of developmentally appropriate community-based opportunities decreased (Menear, 2007). The mothers stated that they felt they had control over their child's health through providing them with healthy foods and unstructured physical activity outside of school. However, the parents also stated that most of their children's physical activity came from their school-based physical education experience. Three of the four mothers interviewed said that unless encouraged by their siblings, if their child with DS had a choice between physical activity and a sedentary activity, their child would choose the sedentary activity every time.

All mothers stated that they would prefer more structured physical activity provided by someone else because they did not have the time themselves. They also mentioned barriers to physical activity such as lack of community-based programs, finances, and other family members' schedules. Five mothers of 5 males with DS between ages 14 and 22 years were interviewed as a group advocating for the teenager group. All of these children received physical education in school and participated in both structured and unstructured physical activity outside of school.

The mothers stated that it was very difficult to motivate their children to be physically active and that the children preferred inclusive activities over adapted, with all children refusing to participate in Special Olympics. Mothers also described that their

children desired the socialization aspect of sports, by wanting to be included with their friends on a competitive team. They emphasized that they wished they got their children involved in an individual sport because “their motor skills did not match their cognitive skills; they were too strong physically for the special needs leagues and teams or they understood enough to know the rules were being modified and they did not want to play with modified rules or with children half their age.”

Lastly, a group of parents of children with DS of mixed ages between 5 and 14 years were interviewed. These parents stated that their hope was for their children to be physically active throughout life and expressed a need for more information on how to incorporate physical activity in the family setting. These parents wished they had more guidance from professionals, such as physical education teachers. All parents reached a consensus on what information should be presented in school. “They thought that it should be given out by the school during regular meetings, should be appropriate for their child’s age, should include a range of individual activities that would interest the child with DS and group activities for the family, and should include very specific activity descriptions and illustrations. Additionally, they thought their children would benefit from keeping an activity or exercise log and submitting it to a teacher or other supervisor on a regular basis. The parents felt this would help them prepare their children to have the motor skills necessary to be physically active as teenagers and adults, either on a team or through an individual sport or a recreational or fitness-oriented activity” (Meneer, 2007).

Alesi and Pepi (2015) conducted a similar study, which explored the parental beliefs of involvement, facilitators/barriers, and benefits of physical activity in young people with DS. The participants in the study were 13 parents (7 mothers, 6 fathers) of

persons with DS between the ages of 7 and 27 years with moderate intellectual disability. In order to investigate the physical activity engagement and parental beliefs of facilitators/barriers and benefits of physical activity of the children with DS, the parents were interviewed in three parts. The first part of the interview consisted of open ended questions to collect data on children's medical and personal history, such as the type of DS, age of diagnosis, engagement in physical activity or medical therapy, family size, order of birth, and family background. The second part of the interview consisted of open questions to explore the children's engagement in physical activity. The third part analyzed parents' beliefs regarding facilitators or barriers for their child in regards to physical activity.

In regards to the first part of the interview, it was found that only one of the individuals with DS (aged 27), did not participate in any sport activity. The other 12 persons with DS engaged in a variety of sport activities, with 9 people engaging in swimming, 8 in football, 5 in basketball, 2 in tennis, 2 in dance, and 1 in martial arts. The frequency of this participation was once a week for seven of the individuals with DS, twice a week for four of them, and daily for one individual. Parents expressed that they wanted their children more involved in team sports because of the opportunity to socialize. One parent also stated that team sport was important to focus attention.

In the second part of the interview, three main facilitation themes were identified: support from family, adapted physical activity experts/coaches and availability of gyms, and the quality of sport activities as a challenging opportunity. In regards to family support, most parents stated that themselves and their family members played a key role in how much physical activity their child with DS was getting. Another facilitator was the

availability of adapted physical activity instructors who were able to work with young people with DS. One parent stated that coaches play a major role in their child's exercise training and that they must know "in depth the limits and capacities" of their child. Another parent stated that their child needs "an expert coach and specialized sport machines that favor his capacities without causing an injury risk." The last facilitating theme identified was the nature of physical activity as being challenging or enjoyable. Parents stated that sport activities were considered to be an opportunity to be successful because they faced up to themselves and others. For example, some parents stated that physical activity gave their child the opportunity to perform their personal best efforts, as well as provided the opportunity to meet individual abilities.

In addition to facilitators, three barrier themes were identified. The first theme was the lack of instructors and coaches expert in adapted physical activity. Parents stated that the main barrier of physical activity was a lack of adapted exercise classes and programs of inclusion for their children with DS. One parent specifically stated that the lack of programs and education for coaches limit the inclusion of their children in sport activities. Another barrier regarded their child's physical or medical characteristics such as gross motor impairments, hypertonicity, weight, heart impairments, and coordination difficulties, which were described as reasons to restrict their child from doing certain exercise and being included in sport teams. Another parent stated with their child's low muscle tone, she needed to be accurately trained because her capacity to perform certain motor skills was limited. Parents also stated that there were cognitive barriers as well for their children, such as having limited communication with their peers.

Lastly, this study identified parent perceptions of benefits of physical activity for their children with DS. The physical benefits were reducing obesity, improving motor coordination, preventing diabetes, and decreasing insomnia. As for affective benefits, parents identified increasing self-esteem and self-image, improving social skills, and improving cognitive functions such as memory and attention.

In the previous study, parent perceptions of physical activity barriers, facilitators, and benefits for persons with DS were explored. In a study by Shutt (2010), physical education content priorities of teachers and parents of children with DS were investigated. For the study, surveys were sent to teachers and parents who worked or resided in Wisconsin or Minnesota. The teacher survey was entitled "Physical Education Teacher Priorities of Curriculum Content for Students with Down Syndrome" and was sent to APE and general physical education (GPE) teachers on Wisconsin and Minnesota electronic mailing lists. A similar survey with different questions was sent to parents of children with DS ages of 4 to 21 years and enrolled in a PK-12 school district. Both parents of a child with DS were asked to complete the online survey separately from their spouse so that in some cases there were two completed parent surveys from a household.

The teacher survey consisted of demographics, the frequency of communication between APE teachers and parents of students with DS, and priority rankings and ratings of physical education curriculum content for students with DS, and priority ratings. The parent survey was created to gather the same information in different perspectives.

A total of 93 APE teachers, 16 GPE teachers, and 53 parents of children with DS completed useable surveys. When analyzing the results, the average reported amount of

times that the parents of children with DS communicated with their child's APE teachers was 5 times annually, while the APE teachers reported an average of 9 times annually.

In terms of curriculum, parents and teachers were asked to prioritize 12 different content areas from highest to lowest priority. Before this, the teachers were asked what grade level they primarily teach and parents were asked what grade level their child was in (early childhood, elementary, secondary). The "combination" option was provided for APE teachers who may have taught multiple age levels. Results demonstrated that GPE teachers prioritized locomotor skills (mean rank of 2) more than the APE teachers and parents, who both ranked the content area as 4. General physical education teachers reported a mean ranking of 8 for the aquatics content area while both parents and APE teachers reported the area on average as 6. The biggest difference found was between the parents and teachers regarding team sports. Parents' mean ranking for team sports was 6 while both APE and GPE teachers ranked team sports on an average of 9 in priority. The ranking means for the other content areas were similar.

Parents, GPE, and APE teachers all ranked locomotor skills, object control skills, health-related physical fitness, and social skills as the most important content areas in physical education for their students or children with DS. Team sports, educational gymnastics/creative movement and dance, adventure education/outdoor pursuits, and physical active video games were ranked as the lowest priority curriculum content areas by the 3 groups.

After ranking the 12 curriculum content areas from high to low priority, the parents, GPE, and APE teachers rated them from 0 (not a priority) to 100 (high priority). All three groups of participants showed high levels of agreement in priority levels for

object control skills, health-related physical fitness, social skills in physical education, individual sports, aquatics, and adventure education/outdoor pursuits. Aquatics showed the most agreement of priority out of all content areas between the three groups, with a rating of 68 out of 100 as an average for each group independently. The biggest differences between ratings of the three groups was the content areas of transitioning from school-based to community-based programming and team sports. Adapted physical education (average rating of 73) and GPE (average rating of 74) teachers found transitioning into the community-based programming as more of a priority than the parents (average rating of 58). As for team sports, parents reported a mean rating of 66, while APE teachers reported 43 and GPE teachers reported 48. Lastly, all groups rated social skills in physical education as the most important content area for a student with DS, while physically active video games were rated the lowest.

The previous studies explored parent perceptions of physical activity and physical education for persons with DS. Columna et al. (2008), however, examined the perspectives and expectations of Hispanic parents of children with all disabilities about their child's adapted physical education (APE) experience. Within this study, three themes were recognized from the analysis: qualified APE professionals, challenges for the family, and normalcy. Regarding qualified APE professionals, it was found that some parents were not familiar with the APE services to which their children were entitled. It was also found that parents held high expectations for the APE professionals, expecting them to have the appropriate knowledge and competencies to work with their children. Parents hoped for their children to be as successful as possible, and believed that participating in physical activity would help their children to develop other learning

domains such as physical and social. The parents believed that teachers could help their children gain confidence by encouraging them to try new things within physical education. The parents also found importance in APE professionals embracing and valuing parental support by including parents more in the educational process. The parents identified barriers that interfered with their involvement, such as lack of knowledge about APE services and activities that they could practice with their children alone (Columna et al., 2008).

Within the second theme, 'challenges for the family,' participating parents shared challenges that they experienced including school transitions, accessing community resources, disability awareness, and living with a child with a disability. In regards to school transitions, parents did not perceive transitions as smooth and described a lack of continuity among the activities taught in PE and did not understand how they transferred to the community. As for accessing community resources, parents showed that they wanted to participate in physical recreation activities within the community, but had obstacles that prevented them from doing so, such as finances, lack of community programs, their child's disability, and/or preference for sedentary lifestyles. It was stated by a mother of a child with autism that it was much easier to keep the kids together in a more sedentary activity than taking them to the park (Columna et al., 2008).

In regards to disability awareness, parents stated that they faced discrimination when trying to access community programs. Often they felt unwelcomed and awkward due to constant stares from others. Parents perceived their communities as needing more disability awareness. The third theme that was analyzed in the study was 'normalcy.' "Parents wanted their children to interact with children without disabilities and enjoy the

same activities as 'typical' children." The parents expressed the importance of socialization for their children (Columna et al., 2008).

A similar study by An and Goodwin (2007) investigated the perceptions of parents of children with spina bifida regarding their physical education programs. The study consisted of interviewing seven mothers of children with spina bifida on the importance of an IEP and school communication. It was found that parents valued their child's participation in physical education and preferred to be involved in their child's program and share information regarding physical activity modifications with the teacher.

These mothers expressed the importance of IEP meetings "as a great venue for sharing information regarding the educational future of their child." The mothers recognized physical education as valuable in teaching a healthy lifestyle and an intervention to prevent obesity through physical activity. The mothers also stated that physical education has many social benefits, such as creating friendships, enjoyment, sense of belonging, and self-confidence. However, the mothers expressed that because of the child's disability, there was a potential for social isolation and negative self-esteem (An & Goodwin, 2007).

The mothers also felt that there were barriers, such as safety, environment, and instruction that limited participation for their children within physical education. It was stated that the mothers felt that there were limited curriculum adaptations and knowledge of their child's disability, and that they felt the teachers did not always implement adaptations and modifications to help their child achieve success (An & Goodwin, 2007).

Current research has explored parent perceptions of physical education and physical activity experiences for children with disabilities. Even though parents stated

that they valued physical activity and physical education, they expressed that they felt they had little influence on the amount of physical activity their children were receiving in school and lacked knowledge of APE services (Menear, 2007; Columna et al., 2008). In addition, they felt that there was a lack of adapted physical activity experts and programs for students with disabilities (Alesi & Pepi, 2015). This information is crucial for adapted physical education teachers so they can work to eliminate these barriers for students with disabilities and find ways to get parents more involved in their child's physical activity experiences.

### **Summary and Conclusions**

Physical education plays a very important role in the lives of children and adolescents with DS because of the tendency of low physical activity levels and susceptibility to obesity (Menear, 2007). Recent research has shown that engaging in physical activity is a primary avenue of prevention and intervention for combating obesity in all populations (Ulrich et al., 2011).

Because of the health conditions associated with DS, persons with DS are less likely to be active than the general population. This may contribute to growing obesity problems in people with DS. However, persons with DS have been found to benefit from physical activity intervention programs, such as the treadmill walking and bicycle training intervention programs discussed in this review of related literature (Carmeli et al., 2004; Ulrich et al., 2011).

Research on parents' perceptions of APE indicated that many parents showed genuine interest in their child's physical education experience, stating that they found it essential to communicate with the teacher through sharing information about the child.

The parents also stated that they believed their children gained many benefits from the social aspect of physical education (Columna et al., 2008). Some parents even described physical education as an intervention to obesity (An & Goodwin, 2007).

Research involving parent perceptions provided information of some of the strengths and weaknesses of physical education and physical activity. Some parents felt that they didn't have the proper communication with APE teachers regarding important information about their children. Parents also felt that teachers didn't always implement the appropriate adaptations needed to include the child and help them to be successful (An & Goodwin, 2007). Another concern or barrier was safety in some of the activities, which limited participation for their kids (An & Goodwin, 2007). Some parents also felt they had no influence of the physical activity their child received during the day (Menear, 2007). Other barriers were identified as health conditions of children with DS such as the presence of a congenital heart defect (Pitetti et al., 2013). Parents also mentioned that there were not many opportunities outside of school, which limited their child's physical activity (Menear, 2007).

Parents provided some suggestions for APE teachers, such as more professional guidance from teachers by providing activities and illustrations for them to do at home with their children (Menear, 2007). They also suggested providing more opportunities for children to try new activities within physical education (Columna et al., 2008). In addition, parents expressed a desire to be a part of the educational process and to have more communication with teachers (Columna et al., 2008).

The purpose of this study was to examine the perceptions of parents of children with DS regarding their child's physical education program. It is crucial for APE teachers

to collaborate with parents, find out their children's needs, and determine the expectations of parents for the physical education program. It is hoped that parents and APE teachers will utilize the results of this study to work together to eliminate barriers for students with DS to be able to provide them with the highest opportunity for success and the tools necessary to live a healthy and active lifestyle.

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