The Psychosocial Outcomes Among Athletes and Youths with Disabilities

A Thesis Presented for the
Master of Science
Degree
The University of Tennessee, Knoxville

Coleen E. Martinez
May 2021

Copyright © 2021 by Coleen E. Martinez
All rights reserved.

Dedication

I dedicate this thesis to my husband, Oscar, and sons, Josh and Willie. Thank you for letting me spend so many days, nights, and weekends working on this! Now we have more time for our new adventure: Backpacking!

Acknowledgements

I would like to thank my committee members for agreeing to serve on my committee and for being supportive and helpful throughout the entire process. Thank you to Dr. Jason Scott, my committee chair, for being open to my research ideas and helping me find a way to put everything together into this thesis. Thank you to Dr. Wozencroft and Dr. Waller for not only serving on my committee but providing applicable and timely advice to allow me to craft a better manuscript.

This thesis would not have been possible without the support from the National Wheelchair Basketball Association (NWBA). Thank you to Will Waller, CEO of NWBA, Dug Jones, Morgan Wood, and all the parents and players of the youth wheelchair basketball division of the NWBA.

Thank you to Rachel Ladd from the University's OIT department for her extensive help with forming my research questions and data analysis plans.

Abstract

Background: Physical activity (PA) through sports participation may help individuals with disabilities improve their health outcomes (physical, psychological and social). Children also participate in sports because it is fun. The majority of research has focused on the physical outcomes of PA. There is a national call to increase the research into the psychological benefits of PA among individuals with disabilities.

Purpose: (1) To conduct a pilot study to utilize the *Health through Sport Model* to determine the effects of wheelchair basketball on physical self-perception and sport enjoyment in youth with disabilities. (2) To conduct a systematic review of research that have used the Physical Self-Description Questionnaire (PSDQ) to examine athletes and youth with disabilities. The research questions asked were: (A) Which disability populations have been assessed using the PSDQ and why? (B) Is the PSDQ a good assessment tool to use with the disability population? (C) Which theoretical frameworks have been used and why? (D) How do the researchers interpret the PSDQ data?

Methods: (1) The pilot study is a one-time cross-sectional designed e-survey that assessed youth wheelchair basketball players using the Physical Self-Description Questionnaire (PSDQ-S) and Sport Enjoyment Scale (SES). All data analysis was descriptive. (2) The systematic review was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Protocols (PRISMA-P).

Results: (1) The participants' (n=19) PSDQ-S score was (M = 1.79, SD = 0.38) and their SES score was (M = 1.05, SD = 0.23). (2) 15 studies met the inclusion criteria, including 2,740 children through adult participants aged 6 to 31 years old. Fourteen disabilities

were assessed using the PSDQ. Fifteen studies did not report any negative comments or critiques related to the PSDQ as an assessment tool and five studies reported the use of a theoretical framework. The researchers interpreted high scores from the PSDQ data as good or positive scores.

Conclusion: (1) The benefits of wheelchair basketball for youth with disabilities are positive scores on the PSDQ-S and SES scales. (2) This review found that the PSDQ is a useful tool to use to study the physical self-concept of athletes and youths with disabilities.

Keywords: PSDQ, Sport Enjoyment, Health through Sport, Therapeutic Recreation, Disability, PRISMA-P

Table of Contents

The Psychosocial Outcomes Among Athletes and Youths with Disabilities 1
Health through Sport Model 3
Problem Statement 5
Purpose 6
Significance of Study 7
References 8
Chapter I The Physical Self-Descriptions and Sport Enjoyment Among Youth Wheelchair Basketball Players: A Pilot Study 10
Abstract 11
The Physical Self-Descriptions and Sport Enjoyment Among Youth Wheelchair Basketball Players: A Pilot Study 12
Literature Review 13
Health through Sport Model 13
Determinants of Sport Participation 13
Therapeutic Recreation and Adapted Sports 14
Sport: Wheelchair Basketball 16
Youth Adapted Sports 17
Health Outcomes: Physical and Psychological 17
Health Outcomes: Psychosocial 18
Method 19
Participants 19
Data Collection 19
Instrumentation 20
Physical Self-Description Questionnaire short form (PSDQ-S) 20
Sport Enjoyment Scale (SES) 20
Results 21
Data Screening 21
Sample 21
Descriptive Statistics 22
Discussion 22
Limitations 27
Future Research 27
Implications for Practice 28
Conclusion 30
References 31
Appendix A 41
Figures 41
Appendix B Tables 42
Appendix C IRB Approval Letter 45
Appendix D Parent Consent Form 47
Appendix E Child Assent 50
Appendix F Benefits of Youth Adapted Sports Survey 51

Chapter II The Physical Self-Description Questionnaire (PSDQ) for Athletes and Youth with Disabilities: A Systematic Review 56
Abstract 57
The Physical Self-Description Questionnaire (PSDQ) for Athletes and Youth with Disabilities: A Systematic Review 58
Literature Review 59
Methodology 64
Protocol 64
Inclusion and exclusion criteria 64
Search strategy 65
Data extraction and synthesis of results 65
Results 65
Study Characteristics 67
Countries of study 67
Participants 67
Sports 70
Study design 70
Theories 71
Outcomes 71
Health 71
Coordination 73
Activity 73
Body Fat 73
Sport 73
Global Physical 74
Appearance 74
Strength 74
Flexibility 74
Endurance 75
Global Esteem 75
Discussion 75
Research Question One 76
Research Question Two 79
Research Question Three 82
Research Question Four 83
Youth with Disabilities and Athletes with Disabilities 86
Future Research 87
Limitations 87
Conclusion 88
References 89
Conclusion 97
Vita 98

List of Tables

Table 1 *Definitions of PSDQ Subscales*..... 42
Table 2 *Demographic Characteristics of Study Participants*..... 43
Table 3 *Definitions of PSDS Subscales.* 61
Table 4 *Studies Investigating the Physical Self-descriptions of Youth with Disabilities*. 68
Table 5 *Studies Investigating the Physical Self-Descriptions of Athletes with Disabilities* 69
Table 6 *Summary of PSDQ Results in Mean and Standard Deviation for Youth*..... 72
Table 7 *Summary of PSDQ Results in Mean and Standard Deviation for Athletes* 72
Table 8 *PSDQ Score Interpretation*..... 85

The Psychosocial Outcomes Among Athletes and Youths with Disabilities

Physical activity in its myriad of forms (exercise, recreation, leisure, sports, etc.) may help a person live a healthy and long life free from chronic diseases such as heart disease, diabetes, and obesity (Centers for Disease Control (CDC), 2019; Health and Human Services (HHS), 2018; Millar, 2016). Unfortunately, "nearly 80 percent of adults are not meeting the guidelines for aerobic and muscle-strengthening activities" which are 60 minutes a day of moderate to vigorous physical activity (MVPA) (HHS, 2018, p. 1). Only "24 percent of children and adolescents accumulate at least 60 minutes of MVPA daily" (Faigenbaum et al., 2020, p. 10). Of particular concern, 60% of adult "Americans live with at least one chronic disease such as heart disease, stroke, cancer, or diabetes which are the leading causes of death and disability in America" (CDC, 2020, p.1). In addition, children between the ages of 13-18 are "more likely to have a long-term illness, disease or condition and to report that their day-to-day activities were limited because of health conditions or disabilities."

Regular physical activity helps to lower blood pressure, decrease low-density lipoprotein (LDL) "bad" blood cholesterol, improve blood sugar, and improve body weight (American Heart Association (AHA), 2016). According to the Physical Activity Guidelines for Americans, children should participate in aerobic physical activity (PA) for at least 60 minutes a day at a moderate to vigorous intensity level and should participate in both muscle and bone strengthening activities three days a week for 60 minutes each (HHS, 2018b). Thirty-three percent of children are physically active every day and children spend seven hours a day in front of a screen (HHS, 2017). Research

suggests regular participation in physical activity such as sports, games, and active play should be a high priority for children in (Faigenbaum et al. 2020).

The prevalence of adults with disabilities who are managing chronic diseases is greater than adults without disabilities (CDC, 2019). Children with disabilities have "lower levels of cardiorespiratory fitness, lower levels of muscular endurance, and higher rates of obesity" than their peers without disabilities (Murphy et al., 2008, p. 1057). While physical activity has been found to be beneficial, children and adults with disabilities are much less active and participate in less vigorous activities than their peers without disabilities (HHS, 2008). In 2008, 56 percent of people with disabilities did not participate in any physical activity at all (HHS, 2008).

Healthy People 2020 found three critical emerging issues in disability and health which include

> "1.) Better disability health data to inform policy and program development regarding critical issues of health disparities and health equities. 2.) Increase implementation of evidence-based health and wellness programs that have been demonstrated to be effective among people with disabilities in community settings. 3.) Improve environmental designs and public infrastructure," (ODPHP, 2020, p.1).

A need exists to engage more youths and adults with disabilities in physical activity. One way to increase rates of physical activity is to participate in sports. Sport involvement can increase physical health, self-esteem, and self-confidence as well as give people that are different a way to fit in (Fink, 2016). Therapeutic Recreation (TR) uses sport as a "modality for developing a healthy personality" (Nagata, 2014, p. 321). In fact,

"sport is one of the most popular modalities used in TR" (Nagata, 2014, p. 323). Adults with disabilities who have participated in sports as youth and adults have higher rates of employment, educational attainment, and physical activity levels when compared to people with disabilities who are not involved in competitive sports (AAA & SDSU, 2018; Krane & Orkis, 2009; Lastuka & Cottingham, 2015). However, around the age of 13, most children stop participating in sports (Miner, 2016). The most common reason given for stopping sport participation is that it stops being fun (Visek et al., 2015).

Common research designs to study exercise for people with and without disabilities is to study physical parameters (heart rate, strength, etc.) (Barwick et al, 2012; Pastula et al., 2012; Tamse et al., 2010; Machek et al., 2008; Stopka et al., 2002; Stopka et al., 1998; Stopka et al., 1994). According to Eime et al. (2013), the "vast majority of research has focused on the physical health benefits of participation in physical activity" (p. 2). Therefore, Eime et al. (2013) developed the *Health through Sport Model* to address the imbalance in the literature and combine the benefits of health, psychological, and social domains through the engagement in youth sports.

Health through Sport Model

The *Health through Sport Model* developed by Eime et al. (2013) provides the conceptual framework for the current study (see Figure 1, Appendix A). The model consists of three major elements that include determinants of leisure participation (based on the Social Ecological Model), sport, and health outcomes of sport participation. The model consists of five categories of health outcomes which include physical, psychological, social, physical/psychological, and psychosocial.

The model was created in large part due to limited research on the psychological and social benefits of youth sport participation. Guided by a thorough systematic review of the academic literature on the topic of psychological and social benefits of participation in sport for children and adolescents, the Health through Sport Model was developed to address the psychosocial benefits of sport participation for youths. Eime et al. (2013) created the model because research on the physical benefits of physical activity is over-saturated in the literature.

Physical activity can, "influence all levels of functioning," such as cognitive, affective, social, emotional, and physical (Shapiro & Martin, 2010, p. 295). Research on the psychological benefits of PA for individuals with disabilities, "has been cited as a national priority as a means to increasing PA" (Shapiro & Martin, 2010, p. 296). For example, a method of evaluating the psychological benefits of PA is through the study of physical self-concept (PSC) which is "an individual's perception of him or herself" (Mayorga-Vega et al., 2012, p. 984). A common assessment tool used to study one's PSC or physical self-perception is the Physical Self-Description Questionnaire (PSDQ) developed by Marsh (1996).

The purpose of this thesis is to: (1) Conduct a pilot study to utilize the *Health through Sport Model* to determine the effects of wheelchair basketball on physical self-perception and sport enjoyment in youth with disabilities. (2) Conduct a systematic review of research that has used the Physical Self-Description Questionnaire (PSDQ) to examine athletes and youths with disabilities. The following research questions were asked: (1) Which disability populations have been assessed using the PSDQ and why? (2) Is the PSDQ a good assessment tool to use with the disability population? (3) Which

theoretical frameworks have been used and why? (4) How do the researchers interpret the PSDQ data?

The hope of this thesis is two-fold, that by presenting the benefits (physical self-perception and enjoyment) of youth and adult adapted sport participation; (1) more communities will develop adapted sports programs and (2) recreational therapists can use this study as supporting data for the continued use of adaptive sports as their therapeutic modalities.

Problem Statement

Physical activity can help people "sleep better, feel better, and function better" (HHS, 2018, p. 20). Plus, participating in regular physical activity reduces a person's risk of developing high blood pressure, high cholesterol, and high blood sugar thus reducing their risk of heart disease, stroke, and diabetes. Yet, with all the information regarding the benefits of physical activity, 36 percent of adults without disabilities are not physically active, 56 percent of adults with disabilities are not active, and 75 percent of children are not achieving recommended levels of physical activity (60 min of MVPA) (HHS, 2008; Faigenbaum et al., 2020). People with disabilities report being in fair or poor health four times as much as people without disabilities (Krahn et al., 2015; Lezzoni, 2011). People with disabilities are at a "much greater risk for developing the types of serious health problems associated with a sedentary lifestyle" like heart disease, stroke, and diabetes (HHS, 2008).

Purpose

When children are physically active, they are more likely to be physically active adults thus, reducing their risks of developing chronic conditions and diseases such as obesity, diabetes, heart disease, and stroke. Unfortunately, only a quarter of children are moderate to vigorously active for 60 minutes a day (MVPA) and children with disabilities spend less time in MVPA than their peers (Faigenbaum et al., 2020; Jung et al., 2018).

One way to increase a child's physical activity is to have them participate in sports. However, youth with disabilities have less choices for sport programming and may have to drive hours to find a competitive adapted sport program. This is unfortunate because sport involvement can increase a child's physical health, self-esteem, and self-confidence as well as give kids that are different a way to fit in (Fink, 2016). However, around the age of 13, most children stop participating in sports (Miner, 2016). The most common reason given for stopping sport participation is that it stops being fun (Visek et al., 2015).

Since physical activity through sports participation can help children improve their physical fitness and overall health, and children participate in sports because it is fun, the purpose of this study is to utilize the *Health through Sport Model* as a guiding framework to determine the effects of wheelchair basketball on physical self-perception and sport enjoyment in youth with disabilities. The hope of this study is two-fold, that by presenting the benefits (physical self-perception and enjoyment) of youth adapted sport

participation; (1) more communities will develop adapted sports programs and (2) recreational therapists will continue to use adaptive sports as their therapeutic modalities.

Significance of Study

Youth guidelines for PA are designed to promote healthy growth and development (HHS, 2018a). Youth who are physically active can expect improvements in; (1) cardiovascular health, (2) muscle strength, (3) bone health, (4) weight, (5) cardiometabolic risk factors (high blood pressure, high cholesterol, high blood sugar), (6) cognition, (7) memory, (8) processing speed, (9) attention, and (10) academic performance (HHS, 2018a). According to Murphy et al. (2008) they found that "physical activity for children with disabilities has been shown to help in controlling or slowing the progression of chronic disease, improving overall health and function, and mediating the psychosocial impact of the condition on children and their families" (p. 1057). Research by Jung et al. (2018) found that children with disabilities spend less time in moderate to vigorous physical activity when compared to their peers making it imperative that promoting MVPA for youth with disabilities is a high priority.

References

(Note: The following list of references are unique to only the main introduction. The rest of the references are listed at the end of each chapter)

Centers for Disease Control and Prevention (CDC). (2019). *Physical activity for people with disabilities*. Retrieved from https://www.cdc.gov/features/fitness-disabilities/index.html

Centers for Disease Control and Prevention (CDC), Disability and Health Promotion. (2019). *Disability impacts all of us*. Retrieved from https://www.cdc.gov/ncbddd/disabilityandhealth/infographic-disability-impacts-all.html

Centers for Disease Control and Prevention (CDC), National Center for Chronic Disease Prevention and Health Promotion. (2020). *Learn tips to boost your health and well-being all year long*. Retrieved from https://www.cdc.gov/chronicdisease/index.htm

Office of Disease Prevention and Health Promotion (ODPHP), *Healthy People 2020*. (2020, April 18). Disability and Health. Retrieved from https://www.healthypeople.gov/2020/topics-objectives/topic/disability-and-health

United States Department of Health and Human Services (HHS), Office of Disease Prevention and Health Promotion, (2018). *Physical Activity Guidelines for Americans 2nd Edition*. Retrieved from https://health.gov/sites/default/files/201909/Physical_Activity_Guidelines_2nd_edition.pdf

United States Department of Health and Human Services (HHS), President's Council on Sports, Fitness, and Nutrition, (2017, January 26). *Facts and Statistics: Physical Activity*. Retrieved (2020, July 10) from https://www.hhs.gov/fitness/resource-center/facts-and-statistics/index.html

United States Department of Health and Human Services (HHS), President's Council on Sports, Fitness, and Nutrition, (2018). *The National Youth Sports Strategy*. Retrieved (2020, July 10) from https://health.gov/sites/default/files/2019-10/National_Youth_Sports_Strategy.pdf

Chapter I

The Physical Self-Descriptions and Sport Enjoyment Among Youth Wheelchair Basketball Players: A Pilot Study

Abstract

Rationale: Physical activity through sports participation can help children improve their physical fitness and overall health, and children participate in sports because it is fun. Therefore, the purpose of this study is to utilize the *Health through Sport Model* as a guiding framework to determine the effects of wheelchair basketball on physical self-perception and sport enjoyment in youth with disabilities.

Methods: Youth wheelchair basketball players completed the Physical Self-Description Questionnaire (PSDQ-S) and Sport Enjoyment Scale (SES). All data analysis was descriptive.

Results: The participants' (n=19) PSDQ-S score was (M = 1.79, SD = 0.38) and their SES score was (M = 1.05, SD = 0.23).

Conclusion: The benefits of wheelchair basketball for youth with disabilities are positive scores on the PSDQ-S and SE scales. Recreational Therapists should use the results of this study to pay extra attention to the health, coordination, flexibility, endurance, and body fat of their youth clients.

Keywords: adapted sports, PSDQ, disability, therapeutic recreation, health through sport

The Physical Self-Descriptions and Sport Enjoyment Among Youth Wheelchair Basketball Players: A Pilot Study

The American Academy of Pediatrics Council on Children with Disabilities found that children with disabilities have "lower levels of cardiorespiratory fitness, lower levels of muscular endurance, and higher rates of obesity" than their peers without disabilities (Murphy et al., 2008, p. 1057). According to Young-Southward et al. (2017), results indicated children between the ages of 13-18 were "more likely to have a long-term illness, disease or condition and to report that their day-to-day activities were limited because of health conditions or disabilities." Twenty percent of children have at least one defined special health care need (Acharya & Msall, 2017) such as obesity (CDC, 2019b), dynapenia, osteopenia, and cardiometabolic disorders" (Faigenbaum et al, 2020, p. 11).

The vast number of children with a defined special need is of particular importance because individuals with disabilities are four times more likely to report their health is fair to poor (Krahn et al., 2015; Lezzoni, 2011) than individuals without disabilities. Physical activity poses several benefits for people with disabilities through improvements in cardiovascular functioning, muscle strength, functional health (walking speed and distance, quality of life, balance, and independence), improvements in body composition, improvements in metabolic health, improvements in mental health, and improvements in pain and fatigue (HHS, 2018a). Sport participation, specifically adaptive sport is one strategy to engage children with disabilities to receive regular physical activity and develop social relationships.

Literature Review

Health through Sport Model

The *Health through Sport Model* developed by Eime et al. (2013) provides the conceptual framework for the current study (see Figure 1, Appendix A). The model consists of three major elements that include determinants of leisure participation, sport, and health outcomes of sport participation. The model consists of five categories of health outcomes which include physical, psychological, social, physical/psychological, and psychosocial. This model depicts the relationship between the determinants of sport, sport participation, and the physical, psychological, and social health outcomes of sport participation.

Determinants of Sport Participation

The determinants of sport participation are based on the Social Ecological Model (SEM) which focuses the individual's interaction with external factors to drive health decisions where "behaviors are affected by and affecting the social environment" (McLeroy et al., 1988, p. 355). The five factors identified that drive health decisions are of intrapersonal, interpersonal, institutional (organizational), community and policy (McLeroy et al., 1988).

> McLeroy et al. (1988) defines the elements of the SEM diagram as follows: (1) "Intrapersonal: Individual characteristics that include knowledge, attitudes, behaviors, self-concept, and skills. (2) Interpersonal: Formal and informal social network and social support systems that include family, work, and friends. (3)

> Institutional (organizational): Social institutions with organizational characteristics and formal or informal operational rules and regulations. (4) Community (environmental): Relationships among organizations, institutions, and informal networks within defined boundaries. (5) Policy: Local, state, and national laws and policies" (p. 355).

An individual must navigate through the five factors of the model in order to participate in a health promotion action such as involvement in a sports team.

According to Berger et al. (2008), determinants of sport participation include higher family incomes and household members who participate in sports. According to Visek et al. (2015), they found that the main determinant of sport participation is fun and when the fun goes away attrition rates increase. According to Shirazipour et al. (2015), they found that parents play a major role in whether or not their children with disabilities participate in sports.

Therapeutic Recreation and Adapted Sports

The American Therapeutic Recreation Association (ATRA) states that Therapeutic Recreation (TR) is a

> "Treatment service designed to restore, remediate and rehabilitate a person's level of functioning and independence in life activities, to promote health and wellness as well as reduce or eliminate the activity limitations and restrictions to participation in life situations caused by an illness or disabling condition" (ATRA, 2020).

Recreational Therapists (RT) are trained to help patients learn to live a leisure lifestyle following an injury, disability, and/or disease. Therapeutic Recreation professionals work in a multitude of settings including but not limited to hospitals, geriatric care, and in the community (Long & Robertson, 2020).

Recreation is considered "important to improve the overall quality of life for those who have disabilities" (Mulhollon & Casey, 2016, p. 20). Adaptive sports through recreation therapy allow participants to learn a new sport or apply adaptations to a previously played sport in order to gain a sense of independence and provide adjustment to their new lifestyle (Mulhollon & Casey, 2016). Mulhollon and Casey (2016) highlight the role communities can play in providing adaptive sports for veterans by bridging the gap between rehabilitation centers and recreation participation. Furthermore, effective communication strategies should inform stakeholders about adapted sports and how to work with the program participants (Mulhollon & Casey, 2016).

Therapeutic recreation uses sport as a "modality for developing a healthy personality," (Nagata, 2014, p. 321). Of particular interest, "sport is one of the most popular modalities used in TR" (Nagata, 2014, p. 323). Nagata (2014) examined athletic identity and self-esteem in quad rugby players. Nagata's (2014) study results of Pearson's correlation found significant negative relationships between exclusivity of athletic identity and self-esteem ($r = -.433$, $p < .01$). According to Nagata (2014), the use of adapted sports in recreational therapy should be used to develop self-esteem and an identity through athletics as a method to find life roles outside of sports. For another example, Bedini et al. (2019) utilized adaptive sports as a therapeutic intervention for geriatric patients in a skilled nursing facility to address self-determination, loneliness, and

mobility. Results indicated adaptive sports facilitated improvement in participants' self-determination and mobility and found a decrease in loneliness.

Sport: Wheelchair Basketball

Staying consistent with the *Health through Sport Model*, participation in a sport is required of participants enrolled in this study. The sport of focus for this study is youth wheelchair basketball. Fiorilli et al. (2013) found wheelchair basketball athletes demonstrated, "better psychological well-being and social skills than participants who do not play wheelchair basketball," (p. 3679). Specifically, wheelchair basketball players exhibited less signs of depression, phobic anxiety, sleep disorder somatization, interpersonal sensitivity, and psychoticism than non-wheelchair basketball players (Fiorilli et al., 2013).

Martin (2008) used four self-efficacy scales (performance, training, thought control, resiliency) along with positive and negative affect to examine self-efficacy in wheelchair basketball players. Martin's (2008) results found that the athletes in his study had the power to produce the desired result of their sport and could manage their thoughts during difficult times. When players had to train through adversity such as fatigue, low motivation, etc. then they were not as able to produce their desired results of the sport. The players showed a strong ability to perform basketball skills when compared with results from a previous study. The athletes showed positive affect by being alert, enthusiastic, and active.

Youth Adapted Sports

The previous studies show support for the positive effects of sport for individuals with disabilities. Moreover, adults with disabilities who have participated in sports as youth and adults have higher rates of employment, educational attainment, and physical activity levels when compared to people with disabilities who are not involved in competitive sports (AAA & SDSU, 2018; Krane & Orkis, 2009; Lastuka & Cottingham, 2015).

Youth who do not participate in physical activity throughout childhood are more likely to be physically inactive as adults thus resulting in a greater risk of developing chronic health diseases such as heart disease (Faigenbaum et al., 2020). Children with disabilities who "participate in play, recreation, and sport has a profound impact on overall growth and development and are essential elements for a satisfying childhood and adolescence" (Rimmer & Rowland, 2008, p. 141).

Health Outcomes: Physical and Psychological

Sport participation has been shown to play a role in the physical self-concept and self-esteem of youth athletes (Scarpa, 2011). Children who perceive themselves as competent and confident in their physical abilities are more likely to participate in sports compared to those who may lack competence and confidence. (Martin, 2006; Harter, 1982). Not surprisingly, belief in one's abilities leads to motivation and increased likelihood of participation in an activity (Martin, 2006). In the sport and exercise field, physical self-concept is also considered a psychological construct that has an impact on physical activity (Scarpa, 2011).

Results from Scarpa's (2011) comparative examination of both athletes with and without disabilities against non-athletes with and without disabilities indicated athletes with disabilities had similar high scores on physical self-concept and self-esteem as the athletes without disabilities. In addition, Simmons and Childers (2013) used the PSDQ to examine the differences between athletes and non-athletes with results indicating athletes had higher levels of PSDQ values than non-athletes.

Peart et al. (2005) examined whether the PSDQ and PSDQ-S can be generalizable to other samples and whether the components of the PSDQ and PSDQ-S are equivalent. The researchers tested two groups of participants, high school students and community members. The study's results indicated the measurements are generalizable and equivalent. According to Pearl et al. (2005), physical self-concept plays an important role in facilitating physical activity.

Health Outcomes: Psychosocial

Eime et al. (2013) acknowledged that the "vast majority of research has focused on the physical health benefits of participation in physical activity" (p. 2). Therefore, Eime et al. (2013) state that a reason for developing the *Health through Sport Model* was due to the lack of research with a theoretical model that is focused on the mental and social health benefits of sport participation.

Scanlan et al. (2003) examined the Sport Commitment Model using elite rugby participants and found sport enjoyment to be highly indicative of sport commitment. In addition, Martin (2006) examined 112 youth athletes with disabilities to measure psychosocial aspects of participation in sports using the following scales: (1) Sport

Commitment Scale, (2) Sport Enjoyment Scale, (3) Parental Encouragement Scale, (4) Sport Friendship Scale, and (5) Perceived Physical Ability Scale. Martin (2006) found high levels of sport commitment and enjoyment, high levels of perceived physical ability, and high levels of sport friendship quality among the 112 youth athletes. According to Martin (2006), "the sport experience was a positive one for these athletes and enjoyment is likely a critical motivational factor in promoting a continued desire to remain in sport," (p. 65).

Method

Participants

Nineteen youth wheelchair basketball players affiliated with the National Wheelchair Basketball Association (NWBA) participated with more males (n = 13) than females (n = 6). Most athletes were Caucasian (n = 15) followed by Asian (n = 2), and Multiracial (n = 2) and ranged in age from 8 to 18 years. Disability classification reported by the athletes were Spinal Cord Injury (SCI) (n = 7), Cerebral Palsy (CP) (n = 3), Congenital anomaly/amputation (CA) (n = 2), and other (n = 6).

Data Collection

Approval was first obtained from the NWBA and then by the university institutional review board to conduct the current study. Participants and their parents completed consent forms and an e-survey.

Instrumentation

Participants provided demographic information (e.g., gender, age, disability), and completed the Physical Self-Description Questionnaire short form (PSDQ-S) and Sport Enjoyment scale (SES).

Physical Self-Description Questionnaire short form (PSDQ-S)

The purpose of the PDSQ-S is to "reflect the physical self-perceptions and self-evaluations," and assess adolescent perceptions regarding their perceived health and physical status (Marsh, 1996, p. 129; Marsh et al., 2010). Good reliability (α= .92) across the 11 scales has been found as well as convergent and discriminant validity (Marsh,1996; Marsh et al., 1994; Marsh et al., 1997; Marsh, 1993). The PSDQ-S is a 40 question instrument that assesses 11 categories: (1) Strength, (2) Body Fat, (3) Activity, (4) Endurance/Fitness, (5) Sports Competence, (6) Coordination, (7) Health, (8) Appearance, (9) Flexibility, (10) Global Physical, and (11) Global Esteem. Responses range from *always true* to *always false* scale using a six point Likert scale. Table 1 provides a definition for each subscale of the PSDQ-S (Marsh, 1996, p. 114).

Sport Enjoyment Scale (SES)

The Sport Enjoyment Scale (SES) is a valid and reliable subscale of the Sport Commitment Model focused on the positive affect of sports participation (Scanlan et al., 1993a). In this study, a modified version using Martin's (2006) approach was used to measure sport enjoyment of wheelchair basketball participants using four questions

measuring enjoyment, happiness, fun, and liking of the sport. Responses were on a 1 to 5-point Likert scale with anchors of *strongly agree* to *strongly disagree*.

Results

Data Screening

All data analyses were performed using SPSS Version 27. The results of the survey were examined for any outliers or missing data. Several respondents started but did not complete the survey (n = 71). Out of those respondents who started the survey, 19 completed the survey. Out of the 19 completed responses, only two data points were not complete in the PSDQ-S scale and were recorded as zero in the data. An outlier existed in the SES scale but not so severe that it needed to be removed.

The results of the two scales; PSDQ-S and SES were examined for normality, skewness, and kurtosis. The results of the PSDQ-S showed the distribution to be slightly negatively skewed (-.345) and slightly negatively kurtosis (-.355). Because of these factors and the observation of the histogram with the bell-curve, the distribution is approximately normal (i.e., bell-shaped). The results of the SES showed the distribution to be positively skewed (4.359) and positively kurtosis (19.00). Because of these factors and the observation of the histogram with the bell-curve, the distribution can be labeled as bell-shaped with a positive skew because of a single outlier.

Sample

Demographic characteristics about the participants are presented in Table 2. Participants reported years playing basketball were 0-5 years (n = 9), 5-10 years (n = 9), and 10+ years (n = 1) and hours spent practicing were 0-3 hours (n = 6), 3-5 hours (n =

9), and 5+ hours (n = 4). Participants described the competition level as travel (n = 12), and recreational (n = 7) and more participants play another sport (n = 11) than those who do not (n = 8). The primary form of movement was wheelchair (n = 7), followed by walking (n = 4), assisted walking with braces (n = 4), and assisted walking with crutches (n = 1).

Descriptive Statistics

Descriptive statistics reporting the PSDQ-S and SES scores are presented below. Means and standard deviations are displayed for the PSDQ-S (M = 1.79, SD = 0.38) and SES (M = 1.05, SD = 0.23). Means and standard deviations are displayed for each subscale of the PSDQ-S including the following: health (M = 2.95, SD = 0.82), coordination (M = 2.07, SD = 0.73), activity (M = 2.08, SD = 0.74), body fat (M = 3.41, SD = 1.05), sport (M = 1.61, SD = 0.71), global physical (M = 1.46, SD = 0.77), appearance (M = 1.73, SD = 0.84), strength (M = 1.58, SD = 0.65), flexibility (M = 2.26, SD = 0.95), endurance (M = 2.81, SD = 0.85), and global esteem (M = 2.74, SD = 0.31).

Discussion

The purpose of this study was to use the *Health through Sport Model* as a guiding framework to determine the effects of wheelchair basketball on physical self-perception and sport enjoyment in youth with disabilities. The *Health through Sport Model* (HTSM) posits that team sports will result in stronger improvements in health (Eime et al., 2013). Further, the HTSM evaluates the "relationship between psychological, psychosocial, and social health outcomes, and their positive associations with sport participation" (Eime et al., 2013, p. 1).

The respondents of this study were involved in a team sport, wheelchair basketball, and reported high levels of physical self-perception which are physical and psychological health outcomes and sport enjoyment which is a determinant of participation in team sports and a psychosocial health outcome. Recall that children cite fun as their reason for participating in sport and the lack of fun as their reason for attrition in sport (Visek et al., 2015). The athletes who took this study's survey reported enjoyment in their sport which is consistent with Visek et al.'s (2015) study.

In this study, the majority of respondents were Caucasian males in high school with different ranges of wheelchair basketball experience and practice time. Due to the limited availability of wheelchair basketball leagues in most communities, wheelchair basketball athletes have to travel in order to play competitively and this was reflected in this study where the majority of respondents participated in travel basketball.

The American Medical Society for Sports Medicine (AMSSM) (2013) found that 88 percent of Division I athletes participated in at least two or three sports as children. Consistent with most youth and the AMSSM (2013) study, the respondents of this study's survey also participate in another sport.

The scale of the PSDQ-S is a True to False scale with 1 being true and 6 being false. Most of the subscales are designed to yield an overall result of 1 to be considered a good or positive score. Those particular scales contain questions that are positively worded. For example, in the Strength subscale, the questions are: (1) I am a physically strong person; (2) I have a lot of power in my body; and (3) I could do well in a test of strength. If a child scores a 1 in this subscale, then researchers would infer that the child is strong and would likely have a strong strength score on a physical fitness assessment.

The Body Fat subscale is the exact opposite of the Strength subscale. For this scale, a score of 6 would be considered a more positive result of the individual's body fat. For example, in the Body Fat subscale, the questions are: (1) My waist is too large; (2) I have too much fat on my body; and (3) I am overweight. If a child scores a 6 on this subscale than researchers would infer that the child is not overweight and would likely have low body fat measurements on a physical fitness assessment.

The Global Esteem subscale has a mixture of positively and negatively worded questions so a score of 3 would indicate a positive result. For example, the questions in the Global Esteem subscale include the following: (1) Overall, most things I do turn out well; (2) Overall, I am no good; (3) Most things I do, I do well; (4) Overall, I have a lot to be proud of; and (5) Nothing I ever do seems to turn out right. If a child scores a 3 on this subscale than researchers would infer that the child has a positive perception of their self-esteem and would likely have a positive score on another measurement of self-esteem.

The PSDQ-S results of this study were positive and generated more positive scores than comparable studies. The results of the Body Fat scale were more negative because the score was not close to 6. Thus, the respondents of this study perceive themselves as being overweight. This finding is consistent with the literature stating that children with disabilities have "higher rates of obesity" than their peers without disabilities (Murphy et al., 2008, p. 1057). The results of the Global Esteem subscale were close to 3 and indicated the respondents have a positive view of their self-esteem. The respondents had a positive perception of their abilities in sport which should be

expected since they are wheelchair basketball athletes. The respondents also had positive perceptions of Global Physical, Appearance, and Strength.

Some results that could shed light on future interventions or research studies is in the subscales of Health, Coordination, Activity, Flexibility, and Endurance because those scores although not bad were not close to 1 and not good either. It is worthwhile to note that this study was conducted during the Covid-19 Pandemic which has caused schools to close and sports to be canceled. Therefore, the reported low activity levels of the respondents may be a result of closures and cancellations due to the pandemic.

An objective of this study is to combat health disparities among children with disabilities by engaging more communities to implement youth adapted sports. The Health subscale score results of this study further show the need to help improve the health of youth with disabilities. The score results were in the middle of the scale meaning they were between good and bad. The Health subscale is the only scale that requires a reverse score (subtract each question score from 7), so someone who considers themselves healthy would score negative one. The questions included in this subscale include: (1) I usually catch whatever illness (flu, virus, cold, etc.) is going around; (2) I am sick so often that I cannot do all the things I want to do; (3) I get sick a lot; (4) When I get sick, it takes me a long time to get better; and (5) I have to go to the doctor because of illness more than most people my age.

The Health subscale results of this study are consistent with the literature which has found that people with disabilities are four times more likely to report that their health is fair to poor (Krahn et al., 2015; Lezzoni, 2011) than people without disabilities. Further, individuals with disabilities are at a “much greater risk for developing the types

of serious health problems associated with a sedentary lifestyle," like heart disease, stroke, and diabetes (HHS, 2008).

The PSDQ-S results of this study are consistent with results of previous research. Specifically, Martin (2006) sampled a population of youth swimmers and track and field athletes with disabilities, he found that the more participants enjoyed their sport, the more positive perceptions they had of their physical abilities. Scarpa (2011) found that athletes had more positive physical self-concept scores than non-athletes. Further, athletes with disabilities and athletes without disabilities had equally strong physical self-concept scores. Morano et al. (2011) found that children with obesity have a "significantly lower self-perception of their physical competence," when compared to children who are not obese, (p. 469). According to Peart et al. (2005) having a stronger physical self-concept will lead to youth being more physically active. The majority of respondents of this study's survey report being active in wheelchair basketball at least 3 to 5 hours per week and also have a positive perception of their physical self which is consistent with Peart et al.'s (2005) findings.

The results of the Sport Enjoyment scale are positive. All but one respondent strongly agreed regarding their enjoyment for the sport of wheelchair basketball. The questions included in the SES scale ask four different questions about playing wheelchair basketball which include whether they: (1) enjoy playing; (2) are happy playing; (3) have fun playing; and (4) like playing. The results are clear that the respondents of this study's survey strongly enjoy their chosen sport of wheelchair basketball.

The SES results of this study are consistent with results of previous research. Specifically, Martin (2006) reported that his sample of youth swimmers and track and

field athletes with disabilities enjoyed their sport experience. The results of this study contribute to the literature because the only other study to have used the sport enjoyment subscale among youth with disabilities is the aforementioned study.

Limitations

A limitation is the small sample size and lack of a comparison group that inhibited generalizability for future studies and hindered any meaningful data analysis such as correlations and regressions.

The study relied on self-reported measures of physical fitness and sport enjoyment by youth participants. The participants may or may not understand each question and they could overestimate or underestimate the answers to the responses. This study only examined participants affiliated with the National Wheelchair Basketball Association (NWBA) meaning that not every single youth who plays wheelchair basketball was included if they were not affiliated with NWBA. The survey was emailed to parents of the participants and the parents needed to forward the email to their children or have the children complete the survey on the parent's computer, so a limitation was the survey going through an intermediary for the participant to access it. The researcher cannot make a participant take the survey or finish the survey making that aspect another limitation.

Future Research

Several research questions that were originally proposed for this study have been left unanswered due to the small sample size. Future research should replicate this study

with a larger sample size to determine if correlations exist between the scales and various demographic characteristics. To replicate this study with a larger sample size, researchers should ensure they have a group of participants that they know and have agreed to participate in the research. The researcher should establish a relationship with the participants in hopes they fill out the survey completely. The researcher should also follow-up with interviews and focus groups to follow-up on the survey data.

Further research into this area should focus on longitudinal studies of youth with disabilities to find causal links between the variables. Future research should also examine what commitment level to sport yields the highest results of sport enjoyment. For example, what is the difference in sport enjoyment in a beginner versus an advanced athlete?

Further, how many years of playing a sport would lead to high levels of sport enjoyment? Future research should utilize some type of comparison group with either participants without disabilities or participants who play or do not play sports. The data would be more impactful if significant differences were found between groups rather than just within the individual study group. In order to gain a holistic perspective of the participants, future research should utilize interviews or case studies of some of the participants to gain more of an insight to the individual implications of the PSDQ-S and SES results.

Implications for Practice

Community leaders can feel confident to utilize the findings of this study to advocate for increased recreation and competitive sports programming for youth with

disabilities. This study found that the participants enjoy their sport so implementing adapted sports would not be a waste because the participants will enjoy it. While the results of the PSDQ-S were mostly positive, there are areas for improvement that both community leaders and recreational therapists can address.

Community leaders can use the results of the PSDQ-S to advocate for more sport programming to help participants improve their overall health and body fat measures. RT's should use the results of the PSDQ-S to pay extra attention to the health, coordination, flexibility, endurance, and body fat of their youth clients. For example, if an RT has a client who is learning to play wheelchair basketball, some areas that will need extra focus would be coordination, flexibility, and endurance. The RT can add extra stretches, implement more coordination exercises and prescribe endurance exercises such as wheeling up and down the basketball court and even wheeling up and down a ramp.

A notable and surprising result of this study was the lack of African American respondents. Community leaders and RT professionals should examine their outreach strategies to ensure a diverse clientele and to make sure all communities are being served.

For future researchers who would like to use this study as a starting point, the following text provides recommendations for best practices: 1) find participants for the survey that you know or have built some sort of relationship with; 2) use direct contact with the participants if possible. For example, the parents of the respondents received the email, gave consent and then had to forward the email to their children. That could have been a cumbersome process that deterred many from participating. 3) Follow-up with the survey participants to gain more insight into their answers.

Conclusion

The study sought to examine the potential benefits of youth adapted sports among wheelchair basketball players. One benefit of youth with disabilities being involved in sport is the increased likelihood of a positive self-perception of physical self. As Martin (2006) and Harter (1982) found, children who perceive themselves as competent and confident in their physical abilities are more likely to participate in sports. Furthermore, when children enjoy their sport, they are more likely to participate and remain involved in sports (Visek et al., 2015). In conclusion, this study found the benefits of youth involved in wheelchair basketball are positive levels of physical self-perception and positive levels of sport enjoyment.

References

Acharya, K., and Msall, M.E. (2017, October 12). Health care disparities among children with special health care needs. *Pediatric Annals*, https://www.healio.com/pediatrics/journals/pedann/2017-10-4610/%7B964c1267-e09c-408c-8723-5c5b8790ab98%7D/health-care-disparities-among-children-with-special-health-care-needs

Aztec Adapted Athletics (AAA) and San Diego State University (SDSU) (2018, February). *Creating California's First College Adapted Athletics Program*. Unpublished.

American Heart Association (AHA), (2016, March 31). *What's the Link Between Physical Activity and Health*? Retrieved from https://www.heart.org/en/health-topics/cardiac-rehab/getting- physically-active/whats-the-link-between-physical-activity-and-health

American Medical Society for Sports Medicine (AMSSM). (2013). *Effectiveness of early sport specialization limited in most sports, sport diversification may be better approach at young age* [Press release]. https://www.amssm.org/News-Release-Article.php?NewsID=69

American Therapeutic Recreation Association (ATRA), About Recreational Therapy. (2020). *What is recreational therapy*? Retrieved from https://www.atra-online.com/page/AboutRecTherapy

Bedini, L.A., Kelly, L.E., McKenzie, K., and Mitchell, K.L. (2019). Impact of a pilot adaptive sports intervention on residents at a skilled nursing facility. *Therapeutic Recreation Journal*, 168(4), 340-367.

Berger, I.E., O'Reilly, N., Parent, M.M., Seguin, B., and Hernandez, T. (2008). Determinants of sport participation among Canadian adolescents. *Sport Management Review*, 11, 277-307.

Boston Children's Hospital. (2020). *Treatments for Childhood Obesity in Children*. Retrieved (2020, July 10) from http://www.childrenshospital.org/conditions-and-treatments/conditions/c/childhood-obesity/treatments

Centers for Disease Control and Prevention (CDC), Disability and Health Promotion. (2019b, September 6). *Disability and Obesity*. Retrieved (2020, July 10) from https://www.cdc.gov/ncbddd/disabilityandhealth/obesity.html

Children's Hemiplegia and Stroke Association (CHASA). (2020). *What is adaptive sports or para-sports*? Retrieved (2020, July 8) from https://chasa.org/adaptive-para-sports/

Choosakul, C., Vongjaturapat, N., Li, F., Hermer, P. (2009). The sport commitment model: an investigation of structural relationships with Thai youth athletic populations. *Measurement in Physical Education and Exercise Science*, 13, 123-139.

Croft, L., Dybrus, S., Lenton, J., and Goosey-Tolfrey, V. (2010). A comparison of the physiological demands of wheelchair basketball and wheelchair tennis. *International Journal of Sports Physiology and Performance*, 5, 301-315.

Dictionary.com (2020, July 8). *Definition of Sport*. Retrieved (2020, July 8) from https://www.dictionary.com/browse/sport

Dwulit, M.P. (2017). Student perceptions of therapeutic recreation. *Therapeutic Recreation Journal*, 51(3), 193-205.

Eime, R.M., Young, J.A., Harvey, J.T., Charity, M.J., and Payne, W.R. (2013). A systematic review of the psychological and social benefits of participation is sport for children and adolescents: informing development of a conceptual model of health through sport. *International Journal of Behavioral Nutrition and Physical Activity*, 10(98), 1-21.

Faigenbaum, A.D., MacDonald, J.P., Carvalho, C., and Rial Rebullido, T. (2020). The pediatric inactivity triad: a triple jeopardy for modern day youth. *ACSM's Health and Fitness Journal*, 24(4), 10-17.

Fink, J.S. (2016). Hiding in plain sight: the embedded nature of sexism in sport. *Journal of Sport Management*, 30, 1-7.

Fiorilli, G., Iuliano, E., Aquino, G., Battaglia, C., Giombini, A., Calcagno, G., and di Cagno, A. (2013). Mental health and social participation skills of wheelchair basketball players: a controlled study. *Research in Developmental Disabilities*, 34, 3679-3685.

Fresh Hobby. (2019, November 10). *What are the most popular adaptive sports*? Fresh Hobby. Retrieved (9/4/20) from https://freshhobby.com/what-are-the-most-popular-adaptive-sports/

Godin, G., and Shephard, R.J. (1985). A simple method to assess exercise behavior in the community. *Canadian Journal of Applied Sport Sciences*, 10, 141-146.

Golden, S.D., and Earp, J.L. (2012). Social ecological approaches to individuals and their contexts: twenty years of health education & behavior health promotion interventions. *Health Education & Behavior*, 39(3), 364-372.

Gummelt, D. (2015, June 3). *Physical activity versus exercise: What's the difference? ACE Fitness*. Retrieved (2020, July 8) from https://www.acefitness.org/education-and-resources/lifestyle/blog/5460/physical-activity-vs-exercise-what-s-the-difference/

Harter, S. (1982). The perceived competence scale for children. *Child Development*, 53(1), 87-97.

Harvard T.H. Chan School of Public Health, The Nutrition Source. (2020). *An Epidemic of Obesity: U.S. Obesity Trends*. Retrieved (2020, July 10) from https://www.hsph.harvard.edu/nutritionsource/an-epidemic-of-obesity/

Jung, J., Leung, W., Schram, B.M., Yun, J. (2018). Meta-analysis of physical activity levels in youth with and without disabilities. *Adapted Physical Activity Quarterly*, 35, 381-402.

Krahn, G.L., Walker, D.K., and Correa-De-Araujo, R. (2015). Persons with disabilities as an unrecognized health disparity population. *Framing Health Matters*, 105(S2), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4355692/pdf/AJPH.2014.302182.pdf

Krane, D., and Orkis, K. (2009, February 12). *Sports and employment among Americans with disabilities.* Harris Interactive. Retrieved (2020, July 8) from https://www.disabledsportsusa.org/wp-content/uploads/2015/11/Sports-and-Employment-Among-People-With-Disabilities-2.pdf

Lastuka, A. and Cottingham, M. (2015). The effect of adapted sports on employment among people with disabilities. *Disability and Rehabilitation*, 1-7.

Lezzoni, L.I. (2011, October). Eliminating health and health care disparities among the growing population of people with disabilities. *Health Affairs*, 30(10), https://www.healthaffairs.org/doi/full/10.1377/hlthaff.2011.0613

Long, T. and Robertson, T. (2020). *Foundations of therapeutic recreation*. Human Kinetics.

Marsh, H.W. (1993). Physical fitness self-concept: relations to field and technical indicators of physical fitness for boys and girls aged 9-15. *Journal of Sport & Exercise Psychology*, 15, 184-206.

Marsh, H.W. (1996). Construct validity of physical self-description questionnaire responses: relations to external criteria. *Journal of Sport and Exercise Psychology*, 18, 111-131.

Marsh, H.W., Richards, G.E., Johnson, S., Roche, L., and Tremayne, P., (1994). Physical Self-Description Questionnaire: Psychometric properties and a multitrait-multimethod analysis of relations to existing instruments. *Journal of Sport & Exercise Psychology*, 16, 270-305.

Marsh, H.W., Hey, J., Roche, L.A., and Perry, C. (1997). The structure of physical self-concept: Elite athletes and physical education students. *Journal of Educational Psychology*, 89, 369–380.

Marsh, H.W., Martin, A.J., Jackson, S. (2010). Introducing a short version of the physical self-description questionnaire: new strategies, short-form evaluative criteria, and applications of factor analyses. *Journal of Sport and Exercise Psychology*, 32, 438-482.

Martin, J.J. (2006). Psychosocial aspects youth disability sport. *Adapted Physical Activity Quarterly*, 23(1), 65-77.

Martin, J.J., Mushett, C.A., and Smith, K.L. (1995). Athletic identity and sport orientation of adolescent swimmers with disabilities. *Adapted Physical Activity Quarterly*, 12(2), 113-123.

Martin, J.J., and Smith, K. (2002). Friendship quality in youth disability sport: Perceptions of a best friend. *Adapted Physical Activity Quarterly*, 19, 472-482.

Martin, J.J. (2008). Multidimensional self-efficacy and affect in wheelchair basketball players. *Adapted Physical Activity Quarterly*, 25, 275-288.

Mayo Clinic. (2019, March 14). *Metabolic Syndrome*. Retrieved (9/2/20) from https://www.mayoclinic.org/diseases-conditions/metabolic-syndrome/symptoms-causes/syc-20351916

McLeroy, K.R., Bibeau, D., Steckler, A., and Glanz, K. (1988). An ecological approach to health promotion programs. *Health Education Quarterly*, 15(4), 351-377.

Miner, J. (2016, June 1). *Why 70 percent of kids quit sports by age 13*. The Washington Post

Morano, M., Collela D., Robazza, C., Bortoli, L., Caprinica, L. (2011). Physical self-perception and motor performance in normal-weight, overweight, and obese children. *Scandinavian Journal of Medicine & Science in Sports*, 21, 465-473.

Mulhollon, S., and Casey, J. (2016). Adaptive sports and equipment for veterans with spinal cord injuries: community partnerships are key to a year-round adapted sports program for Milwaukee veterans. *Palaestra*, 30(4), 20-24

Murphy, N.A., Carbone, P.S., and the Council on Children with Disabilities. (2008). Promoting the participation of children with disabilities in sports, recreation, and physical activities. *Pediatrics*, 121(5), 1057-1061.

Nagata, S. (2014). A pilot study of exclusivity of athletic identity among wheelchair rugby players. *Therapeutic Recreation Journal*, 48(4), 320-331.

National Wheelchair Basketball Association (NWBA). (2021, January 5). *History of wheelchair basketball and NWBA*. https://www.nwba.org/history

Office of Disease Prevention and Health Promotion (ODPHP), *Healthy People 2020*. (2020, April 18). Disability and Health. Retrieved from https://www.healthypeople.gov/2020/topics-objectives/topic/disability-and-health

Peart, N.D., Marsh, H.W., and Richards, G.E. (2005). *The physical self-description questionnaire: furthering research linking physical self-concept, physical activity, and physical education.* Paper presented at American Association for Research in Education.

Reiter, J.P. (2000, January). *Using statistics to determine causal relationships*. The American Mathematical Monthly http://www2.stat.duke.edu/~jerry/Papers/causal.pdf

Rimmer, J. A., and Rowland, J.L. (2008). Physical activity for youth with disabilities: A critical need in an underserved population. *Development Neurorehabilitation*, 11(2), 141-148.

Scanlan, T.K., Carpenter, P.J., Simons, J.P., Schmidt, G.W., and Keeler, B. (1993a). An introduction to the sport commitment model. *Journal of Sport and Exercise Psychology*, 15, 1-15.

Scanlan, T.K., Russell, D.G., Beals, K.P., and Scanlan, L.A. (2003). Project on elite athlete commitment (PEAK): II a direct test and expansion of the sport commitment model with elite amateur sportsmen. *Journal of Sport and Exercise Psychology*, 25, 377-401.

Scarpa, S. (2011). Physical self-concept and self-esteem in adolescents and young adults with and without physical disability: the role of sports participation. *European Journal of Adapted Physical Activity*, 4(1), 38-53.

Shapiro, D.R., and Martin, J.J. (2010). Athletic identity, affect, and peer relations in youth athletes with physical disabilities. *Disability and Health Journal*, 3, 79-85.

Shirazipour, C.H., Latimer-Cheung, A.E., and Arbour-Nicitopoulos, K.P. (2015). An exploratory qualitative investigation of psychosocial determinants of parent decisions to support sport participation for youth with a mobility impairment. *Research in Developmental Disabilities*, 45-46, 400-410.

Sherrill, C. Hinson, M., Gench, B., Kennedy, S.O., and Low, L. (1990). Self-concepts of disabled youth athletes. *Perceptual and Motor Skills*, 70, 1093-1098.

Sikes, E.M., Richardson, E.V., Cederberg, K.J., Sasaki, J.E., Sandroff, B.M., and Motl, R.W. (2019). *Disability and Rehabilitation*, 41(11), 1243-1267.

Simmons, S. and Childers, K. (2013). Effects of intercollegiate athletes and intramural participation on self-esteem and physical self-description: a pilot study. *Recreational Sports Journal*, 37, 160-168.

Steel Soccer. (2017, December 9). *What are the five most popular youth sports? Steel Soccer*. Retrieved (9/4/20) from https://steelsoccer.com/steel-soccer-news/5-popular-youth-sports/

Steptoe, A., and Butler, N. (1996). Sports participation and emotional wellbeing in adolescents. *The Lancet*, 347, 1789-1792.

Strand, J. (2019). *The impact of youth adapted sports camp*. [Unpublished doctoral dissertation]. University of Texas, Arlington.

Turnnidge, J., Hancock, D.J., and Cote, J. (2012). The influence on birth date and place of development on youth sport participation. *Scandinavian Journal of Medicine & Science in Sports*, 24, 461-468.

United States Department of Health and Human Services (HHS). (2008). *Physical activity guidelines advisory committee report*. Washington, D.C.

United States Department of Health and Human Services (HHS), Office of Disease Prevention and Health Promotion, (2018b). *Physical Activity Guidelines for Americans 2nd Edition*. Retrieved from https://health.gov/sites/default/files/201909/Physical_Activity_Guidelines_2nd_edition.pdf

United States Department of Health and Human Services (HHS), President's Council on Sports, Fitness, and Nutrition, (2017, January 26). *Facts and Statistics: Physical Activity*. Retrieved (2020, July 10) from https://www.hhs.gov/fitness/resource-center/facts-and-statistics/index.html

U.S. Department of Justice (2020, February). *A guide to disability rights law*. Retrieved (9/2/20) from https://www.ada.gov/cguide.htm

Visek, A.J., Achrati, S.M., Manning, H., McDonnell, K., Harris, B.S., and DiPietro, L. (2015). The fun integration theory: towards sustaining children and adolescents sport participation. *Journal of Physical Activity Health*, 12(3), 424-433.

WebMD, (2020, September 2). *What is Osteoporosis*? Retreived (9/2/20) from https://www.webmd.com/osteoporosis/guide/osteopenia-early-signs-of-bone-loss#1

Weiss, M.R., and Smith, A.L. (1999). Quality of youth sport friendships: Measurement and validation. *Journal of Sport and Exercise Psychology*, 21 145-166.

Weiss, W.M., Weiss, M.R., and Amorose, A.J. (2010). Sport commitment among competitive female athletes: test of an expanded model. *Journal of Sports Sciences*, 28(4), 423-434.

World Health Organization (WHO). (2020). *What is moderate-intensity and vigorous-intensity physical activity?* https://www.who.int/dietphysicalactivity/physical_activity_intensity/en/

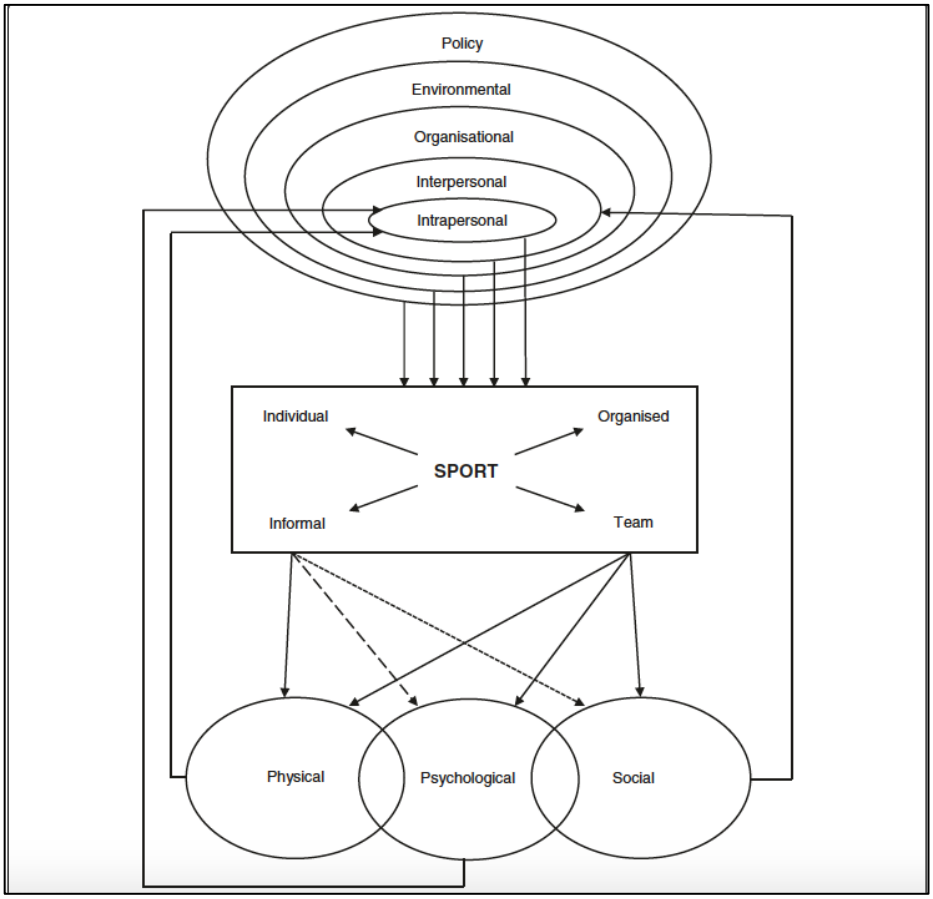
Young-Southward, G., Rydzewska, E., Philo, C., and Cooper, S.A. (2017). Physical and mental health of young people with and without intellectual disabilities: cross-sectional analysis of a whole country population. *Journal of Intellectual Disability Research*, 61(10), 984 – 993.

Zelener, J., and Schneider, M. (2016). Adolescents and self-reported physical activity: an evaluation of the modified Godin leisure-time exercise questionnaire. *International Journal of Exercise Science*, 9(5), 587-598.

Appendix A

Figures

Figure 1 *Health through Sport Model (Eime et al., 2013)*



Appendix B

Tables

Table 1 *Definitions of PSDQ Subscales*

Subscale	Definition
Appearance	Being good looking, having a nice face
Strength	Being strong, having a powerful body with lots of muscles
Endurance	Being able to run a long way without stopping, not tiring easily when exercising hard
Flexibility	Being able to bend and turn your body easily in different directions
Health	Not getting sick often, getting well quickly when you are sick
Coordination	Being good at coordinated movements, being able to do physical movements smoothly
Activity	Being physically active, doing lots of physical activities regularly
Body Fat	Not being overweight, not being too fat
Sport	Being good at sports, being athletic, having good sports skills
Global Physical	Feeling positive about one's physical self
Global Esteem	Overall positive feelings about self

Table 2 *Demographic Characteristics of Study Participants* (*n* = 19)

Characteristic	*N*	%
Gender		
Male	13	68.4
Female	6	31.6
Age		
8-11 years	2	10.5
12-14 years	6	31.6
15-18 years	11	57.9
Grade		
2-5 grades	1	5.3
6-8 grades	7	36.8
9-12 grades	11	57.9
Race		
Caucasian/White	15	78.9
Asian	2	10.5
Multiracial	2	10.5
Years of playing basketball		
0-5 years	9	47.4
5-10 years	9	47.4
10+ years	1	5.3
Hours practicing and playing wcbball		
0-3 hours	6	31.6
3-5 hours	9	47.4
5+ hours	4	21.1
Competition Level		
Recreational	7	36.8
Travel	12	63.2
Play another sport		
Yes	11	57.9
No	8	42.1
Disability Classification		
Spinal Cord Injury (SCI)	7	36.8
Cerebral Palsy (CP)	3	15.8
Congenital anomaly/amputation (CA)	2	10.5

Table 2 continued

Characteristic	*N*	%
Other	6	31.6
n/a	1	5.3
SCI Classification		
Low-level Quadriplegia	1	16.7
Paraplegia: Wheelchair	3	50
Paraplegia: Ambulatory	2	33.3
CP Classification		
C2	1	50
C8	1	50
CA Classification		
two legs only	1	50
one arm, one leg (same side)	1	50
Primary form of movement		
Walking	4	21.1
Assisted Walking (braces)	4	21.1
Assisted Walking (crutches)	1	5.3
Wheelchair	7	36.8
n/a	3	15.8

Note: wcbball is an abbreviation for wheelchair basketball

Appendix C

IRB Approval Letter

November 23, 2020

Coleen Elizabeth Martinez,

UTK - Coll of Education, Hlth, & Human - Kinesiology Recreation & Sport Studies

Re: UTK IRB-20-06085-XP

Study Title: Benefits of youth adapted sports among wheelchair basketball players

Dear Coleen Elizabeth Martinez:

The UTK Institutional Review Board (IRB) reviewed your application for the above referenced project. It determined that your application is eligible for expedited review under 45 CFR 46.110(b)(1), [edit: category/ies (5) and (7). The use of children as subjects is approved under 45 CFR 46.404, in that it involves no more than minimal risk (record abstraction only). The use of pregnant women and fetuses as subjects is approved under 45 CFR 46.204.] The IRB has reviewed these materials and determined that they do comply with proper consideration for the rights and welfare of human subjects and the regulatory requirements for the protection of human subjects. Therefore, this letter constitutes full approval by the IRB of your application (version 1.0).

Approval Information:

Application v 1.0, Expedited category 7, waiver of documentation of consent, waiver of documentation of assent, n = 850, CR required (Student Researcher, children participants)

Approved Documents;

2 parent-permission-Martinez v 1.2

2 Child_Assent_Martinez v 1.0

NWBA IRB Letter v 1.0

Recruitment Email Follow-ups v 1.0

Email Template for NWBA v 1.0

Scales and Demographics v 1.0

Approval of this study will be valid from November 23, 2020 to 11/22/2021.

In the event that subjects are to be recruited using solicitation materials, such as brochures, posters, web-based advertisements, etc., these materials must receive prior approval of the IRB.

Please note that restrictions are in place due to the COVID-19 pandemic, and all in-person contact with research participants is on hold until further notice.

- Newly-approved studies with in-person interactions may not begin enrollment until further notice from the IRB/HRPP.
- Newly-approved studies with no in-person participant interaction may begin after receiving IRB approval.

Please monitor the COVID-19 Updates at https://www.utk.edu/coronavirus/faq/ for the latest information. Human Subjects Research updates are being filed under Information for Instructors/Research.

Any revisions in the approved application must also be submitted to and approved by the IRB prior to implementation. In addition, you are responsible for reporting any unanticipated serious adverse events or other problems involving risks to subjects or others in the manner required by the local IRB policy.

Finally, **re-approval** of your project is required by the IRB in accord with the conditions specified above. You may not continue the research study beyond the time or other limits specified unless you obtain prior written approval of the IRB.

Sincerely,



Colleen P. Gilrane, Ph.D., Chair

Appendix D

Parent Consent Form

Permission for Research Participation of a Minor

Research Study Title: Benefits of Youth Adapted Sports Among Wheelchair Basketball Players

Researchers: Coleen Martinez, University of Tennessee, Knoxville
Dr. Jason Scott, CTRS, University of Tennessee, Knoxville

Why is my child being asked to be in this research study?
We are asking your child to be in this research study because your child is between the ages of 8 and 18 and is a wheelchair basketball player affiliated with the National Wheelchair Basketball Association (NWBA).

What is this research study about?
Since physical activity through sports participation can help children improve their physical fitness and overall health, and children participate in sports because it is fun, the purpose of this study is to utilize the *Health through Sport Model* to determine the physical self-perceptions and sport enjoyment of adolescent wheelchair basketball players. The hope of this study is two-fold, that by presenting the benefits (physical self-perception and enjoyment) of youth adapted sport participation; (1) more communities will develop adapted sports programs and (2) more recreational therapists will add adaptive sports to their therapeutic modalities.

How long will my child be in the research study?
If you give permission for your child to be in the study, and your child agrees, their participation will last no longer than 15 minutes.

What will happen if I say "Yes, I want my child to be in this research study"?
If you give permission for your child to be in this study, we will ask your child to fill out an online survey one time.

What happens if I say "No, I do not want my child to be in this research study"?
Your child's being in this study is up to you. You can say no now or leave the study later, either way, your decision won't affect your child's relationship with the researchers or the University of Tennessee.

What happens if I say "Yes" but change my mind later?
Even if you decide to allow your child to be in the study now, you can change your mind and stop at any time.

If you decide to stop before the study is completed, all you or your child will need to do is exit the survey by closing the survey or web page window. If you withdraw from the study before data collection is completed your data will be removed and will not be used

in data analyses. Once the survey has been submitted, we will not be able to remove your responses because we will not know which data came from your survey.

Are there any possible risks to my child?
We don't know of any risks to your child from being in the study.

Are there any benefits to being in this research study?
We do not expect your child to benefit from being in this study. Your child's participation may help us to learn more about adapted sports among youth athletes with disabilities. We hope the knowledge gained from this study will benefit others in the future.

Who can see or use the information collected for this research study?
The survey is anonymous, and no one will be able to link your child's responses back to your child. Your child's responses to the survey will not be linked to your computer, email address or other electronic identifiers.

All survey data will be securely stored on the researcher's password-protected laptop. Data will only be made available to me, as the researcher, and my major advisor, unless participants specifically give permission in writing to do otherwise.

Information collected for this study will be published and possibly presented at scientific meetings.

What will happen to my child's information after this study is over?

We will not keep your child's information to use for future research.

We will not share your child's research data with other researchers.

Will my child be paid for being in this research study?

Your child will not be paid for being in this study.

Will it cost me anything for my child to be in this research study?

It will not cost you anything for your child to be in this study.

Who can answer my questions about this research study?
If you have questions or concerns about this study, or have experienced a research related problem or injury, contact the researchers, Coleen Martinez at cmarti67@vols.utk.edu and 865-567-0569, or my advisor, Dr. Jason Scott at jlscott@utk.edu.

For questions or concerns about your rights or to speak with someone other than the research team about the study, please contact:

Institutional Review Board
The University of Tennessee, Knoxville
1534 White Avenue
Blount Hall, Room 408
Knoxville, TN 37996-1529
Phone: 865-974-7697
Email: utkirb@utk.edu

STATEMENT OF PERMISSION

I have read this form, been given the chance to ask questions and have my questions answered. If I have more questions, I have been told who to contact. By clicking the "I Agree" button below, I am agreeing for my child to be in this study. I can print or save a copy of this consent information for future reference. If I do not want my child to be in this study, I can close my internet browser.

Appendix E

Child Assent

ASSENT TO PARTICIPATE IN RESEARCH

Benefits of Youth Adapted Sports Among Wheelchair Basketball Players

1. My name is Coleen Martinez

2. We are asking you to take part in a research study because we would like to learn about your physical self-perception and if you enjoy playing wheelchair basketball.

3. If you agree to be in this study all you need to do is fill out an online survey.

4. There are not any risks to you for filling out this survey.

5. There are not any direct benefits to your participation, but the information we gather will help us understand why youth adapted sports is a good thing for kids to spend their time doing.

6. Please talk this over with your parents before you decide whether or not to participate. We will also ask your parents to give their permission for you to take part in this study. But even if your parents say "yes" you can still decide not to do this.

7. If you don't want to be in this study, you don't have to participate. Remember, being in this study is up to you and no one will be upset if you don't want to participate or even if you change your mind later and want to stop.

8. You can ask any questions that you have about the study. You can call or text me at 865-567-0569 or send me an email at cmarti67@vols.utk.edu.

9. By clicking the "I Agree" button below, I am agreeing to be in this study. You can print or save a copy of this assent for future reference. If you do not want to be in this study, you can close your internet browser.

Appendix F

Benefits of Youth Adapted Sports Survey

Inclusion Questions (must answer Yes to continue)

Are you over the age of 18?

1. Yes
2. No

Are you a current or former wheelchair basketball player?

1. Yes
2. No

Physical Self-Description Questionnaire

Indicate whether you think the following statements are true about you or are false about you.

	Always True	Usually True	True	False	Usually False	Always False
I feel confident when doing coordinated movements.	❑	❑	❑	❑	❑	❑
I am a physically strong person.	❑	❑	❑	❑	❑	❑
I am quite good at bending, twisting, and turning my body.	❑	❑	❑	❑	❑	❑
I can run a long way without stopping.	❑	❑	❑	❑	❑	❑
Overall, most things I do turn out well.	❑	❑	❑	❑	❑	❑
I usually catch whatever illness (flu, virus, cold, etc.) is going around.	❑	❑	❑	❑	❑	❑
Controlling movements of my body comes easily to me.	❑	❑	❑	❑	❑	❑
I often do exercise or activities that make me breathe hard.	❑	❑	❑	❑	❑	❑
My waist is too large.	❑	❑	❑	❑	❑	❑
I am good at most sports.	❑	❑	❑	❑	❑	❑
Physically, I am happy with myself.	❑	❑	❑	❑	❑	❑
I have a nice looking face.	❑	❑	❑	❑	❑	❑

I have a lot of power in my body.	❑	❑	❑	❑	❑	❑
My body is flexible.	❑	❑	❑	❑	❑	❑
I am sick so often that I cannot do all the things I want to do.	❑	❑	❑	❑	❑	❑
I am good at coordinated movements.	❑	❑	❑	❑	❑	❑
I have too much fat on my body.	❑	❑	❑	❑	❑	❑
I am better looking than most of my friends.	❑	❑	❑	❑	❑	❑
I can perform movements smoothly in most physical activities.	❑	❑	❑	❑	❑	❑
I do physically active things (jog, dance, bicycle, aerobics, gym, swim) at least 3 times a week.	❑	❑	❑	❑	❑	❑
I am overweight.	❑	❑	❑	❑	❑	❑
I have good sports skills.	❑	❑	❑	❑	❑	❑
Physically, I feel good about myself.	❑	❑	❑	❑	❑	❑
Overall, I am no good.	❑	❑	❑	❑	❑	❑
I get sick a lot.	❑	❑	❑	❑	❑	❑
I find my body handles coordinated movements with ease.	❑	❑	❑	❑	❑	❑
I do lots of sports, dance, gym, or other physical activities.	❑	❑	❑	❑	❑	❑
I am good looking.	❑	❑	❑	❑	❑	❑
I could do well in a test of strength.	❑	❑	❑	❑	❑	❑
I can be physically active for a long period of time without getting tired.	❑	❑	❑	❑	❑	❑
Most things I do, I do well.	❑	❑	❑	❑	❑	❑
When I get sick, it takes me a long time to get better.	❑	❑	❑	❑	❑	❑
I do sports, exercise, dance, or other physical activities almost every day.	❑	❑	❑	❑	❑	❑
I play sports well.	❑	❑	❑	❑	❑	❑
I feel good about who I am physically.	❑	❑	❑	❑	❑	❑
I think I would perform well on a test measuring flexibility.	❑	❑	❑	❑	❑	❑

I am good at endurance activities like distance running, aerobics, bicycling, swimming, cross-country, or swimming.	❑	❑	❑	❑	❑	❑
Overall, I have a lot to be proud of.	❑	❑	❑	❑	❑	❑
I have to go to the doctor because of illness more than most people my age.	❑	❑	❑	❑	❑	❑
Nothing I ever do seems to turn out right.	❑	❑	❑	❑	❑	❑

Sport Enjoyment

Indicate whether you agree or disagree with the following statements

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I enjoy playing wheelchair basketball.	❑	❑	❑	❑	❑
I am happy playing wheelchair basketball.	❑	❑	❑	❑	❑
I have fun playing wheelchair basketball.	❑	❑	❑	❑	❑
I like playing wheelchair basketball.	❑	❑	❑	❑	❑

Demographic Questions

Now, to help us classify your answers, would you mind answering the following questions?

How old are you?

1. 8-11
2. 12-14
3. 15-18

What is your gender?

1. Male
2. Female

What grade are you in? Please select a range from the options.

1. 2-5 grades
2. 6-8 grades
3. 9-12 grades

What is your race?

1. Hispanic or Latino
2. American Indian or Alaska Native
3. Asian
4. Black or African American
5. Native Hawaiian or Other Pacific Islander
6. Caucasian or White
7. Multiracial
8. Other
9. Prefer not to say

How many years have you played basketball?

1. 0-5
2. 5-10
3. 10+

How many hours do you play and practice wheelchair basketball weekly during the season?

1. 0-3
2. 3-5
3. 5+

What is your competition level?

1. Recreational
2. Travel

Do you play another sport?

1. Yes
2. No

Do you have a disability as defined by the Americans with Disabilities Act (ADA)? Disability: Have a physical or mental impairment that substantially limits one or more major life activities; has a record of such impairment; or is regarded as having such an impairment.

1. Yes
2. No

What is your disability classification?

1. Spinal Cord Injury
2. Intellectual Disability
3. Cerebral Palsy
4. Visual Disability
5. Congenital anomaly or amputation

Spinal Cord Injury Classification

1. Low-level Quadriplegia
2. Paraplegia: Wheelchair (PW)
3. Paraplegia: Ambulatory (PA)

Cerebral Palsy Classification

1. C1
2. C2
3. C3
4. C4
5. C5
6. C6
7. C7
8. C8

Congenital Anomaly Classification

1. One arm only
2. Two arms only
3. One leg only
4. Two legs only
5. One arm, one leg (same side)
6. One arm, one leg (opposite side)

What is your primary form of physical movement?

1. Walking
2. Assisted walking (braces)
3. Assisted walking (crutches)
4. Assisted walking (walker)
5. Wheelchair
6. Other
7. N/A

Chapter II

The Physical Self-Description Questionnaire (PSDQ) for Athletes and Youth with Disabilities: A Systematic Review

Abstract

Objectives: The aim of this study was to conduct a systematic review of research that has used the Physical Self-Description Questionnaire (PSDQ) to examine athletes and youths with disabilities. The following research questions were asked: (1) Which disability populations have been assessed using the PSDQ and why? (2) Is the PSDQ a good assessment tool to use with the disability population? (3) Which theoretical frameworks have been used and why? (4) How do the researchers interpret the PSDQ data?

Method: The design of this study was a systematic search of the literature guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Protocols (PRISMA-P).

Results: Fifteen studies met the inclusion criteria, including 2,740 children through adult participants aged 6 to 31 years old. Fourteen disabilities were assessed using the PSDQ. All 15 studies did not report any negative comments or critiques related to the PSDQ as an assessment tool. Five studies reported the use of a theoretical framework. The researchers interpreted high scores from the PSDQ data as good or positive scores.

Conclusion: This review found that the PSDQ is a useful tool to use to study the physical self-concept of athletes and youths with disabilities.

Keywords: PSDQ, disability, youth, athletes, PRISMA-P

The Physical Self-Description Questionnaire (PSDQ) for Athletes and Youth with Disabilities: A Systematic Review

Evidence-based programs have shown to be beneficial for helping people with disabilities improve their physical fitness, job skills, and Special Olympics events (Barwick et al, 2012; Dahlgren et al., 1991; Machek et al., 2008; Pastula et al., 2012; Rimmer & Kelly, 1991; Stopka et al., 1994, Stopka et al., 1998, and Tamse et al., 2010). Of particular concern is the importance of to providing more opportunities of physical activity (PA) for young adults with disabilities not only so they too can maintain a healthy lifestyle but so they can endure the rigors of vocational pursuits (stocking shelves, shopping, working, and cleaning) and enable them to participate in community recreation (softball, pickleball, wheelchair basketball, Special Olympics, and Paralympics, etc.).

Common research designs to study exercise for individuals with disabilities is to examine physical parameters such as the Brockport Physical Fitness Test, the 3-minute step test, push-ups, sit-ups, body composition, heart rate, blood pressure, one repetition maximum (1 RM), sit and reach test, and 50-yard dash (Barwick et al, 2012; Pastula et al., 2012; Tamse et al., 2010; Machek et al., 2008; Stopka et al., 2002; Stopka et al., 1998; Stopka et al., 1994). While these methods of analysis are the most commonly used tools of assessment, yet the examination of the numerous physiological, psychosocial, psychological, and social benefits of physical activity engagement for individuals with disabilities remain limited (Martin, 2006; Martin & Whalen, 2012).

The Physical Self-Description Questionnaire (PSDQ) is a commonly used physical and psychological assessment tool designed primarily for youth populations to

examine the diversity of nonphysical aspects of physical activity Marsh (1996) (Scarpa, 2011; Simmons & Childers, 2013; Steptoe & Butler, 1996; Peart et al., 2005; Morano et al., 2011).

Literature Review

The PSDQ is based on self-concept which is, "an individual's perception of him or herself," and is developed through interactions with the environment (Mayorga-Vega et al., 2012, p. 984). As children enter adolescence their bodies start to change as well as their ability to assess their physical self and accompanying skills, thus creating their self-concept (Mayorga-Vega et al., 2012).

Research by Shavelson into self-description questionnaires (SDQ) showed strong support for multidimensional self-concept instruments (Marsh et al., 2010). However, the first SDQ instruments covered academic, social, physical, and emotional domains but lacked information directly related to fitness and health (Marsh et al., 2010). In response to the need for a physical self-concept instrument, Marsh (1996) created the PSDQ.

The PSDQ is a multidimensional physical self-concept (PSC) instrument in order to measure one's physical self-perceptions and self-evaluations called the Physical Self-Description Questionnaire (PSDQ) (Marsh, 1996). The intention of the PSDQ is to measure the PSC of youth. However, the intention of the PSDQ is not a predictor of performance on physical fitness tests (Marsh, 1996). Marsh and his colleagues have extensively studied the reliability and validity of the PSDQ through a number of studies (Marsh,1996; Marsh et al., 1994; Marsh 1993; Marsh et al., 1997). The original PSDQ is a 70-question assessment with eleven subscales that measure: (1) Strength, (2) Body Fat,

(3) Activity, (4) Endurance/Fitness, (5) Sports Competence, (6) Coordination, (7) Health, (8) Appearance, (9) Flexibility, (10) Global Physical, and (11) Global Esteem. Good reliability (α= .92) across the eleven scales has been found (Marsh,1996; Marsh et al., 1994).

Marsh et al., (1994) found the PSDQ to have convergent and discriminant validity as shown by a multi-trait-multi-method (MTMM) of responses to three PSC instruments. Those instruments were the Physical Self-Perception Profile (PSPP), the Physical Self-Concept Scale, and the PSDQ. Marsh and his colleagues have also found the PSDQ to have convergent and discriminant validity when compared with external criteria from the Australian Health and Fitness Survey (Marsh, 1993; Marsh 1996; Marsh et al., 1997).

A short form of the PSDQ, referred to the PSDQ-S was developed by Marsh et al. (2010) and contains 40 questions with the same eleven subscales as the long-form version. For the purposes of this review, no distinction was made between the PSDQ and PSDQ-S as the PSDQ-S was shown to be, "nearly identical to the PSDQ," through studies of convergent and discriminate validity (Marsh et al., 2010, p. 438). A study by Peart et al. (2005) also examined the equivalency of the PSDQ to the PSDQ-S and found the measurements to be equivalent.

Table 3 presents the definitions of the eleven subscales of the PSDQ. The scale of the PSDQ is on a 6-point *true* to *false* Likert scale with 1 being always true and 6 being always false. The following will provide examples of questions on the assessment: An example of a Health question is (1) I usually catch whatever illness (flu, virus, cold, etc.)

Table 3 *Definitions of PSDS Subscales.*

Subscale	Definition
Appearance	Being good looking, having a nice face
Strength	Being strong, having a powerful body with lots of muscles
Endurance	Being able to run a long way without stopping, not tiring easily when exercising hard
Flexibility	Being able to bend and turn your body easily in different directions
Health	Not getting sick often, getting well quickly when you are sick
Coordination	Being good at coordinated movements, being able to do physical movements smoothly
Activity	Being physically active, doing lots of physical activities regularly
Body Fat	Not being overweight, not being too fat
Sport	Being good at sports, being athletic, having good sports skills
Global Physical	Feeling positive about one's physical self
Global Esteem	Overall positive feelings about self

that is going around. An example of a Coordination question is (2) I feel confident when doing coordinated movements. An example of an Activity question is (3) I often do exercise or activities that make me breathe hard. An example of a Body Fat question is (4) My waist is too large. An example of a Sport question is (5) I am good at most sports. An example of a Global Physical question is (6) Physically, I am happy with myself. An example of an Appearance question is (7) I have a nice-looking face. An example of a Strength question is (8) I am a physically strong person. An example of a Flexibility question is (9) I am quite good at bending, twisting, and turning my body. An example of an Endurance question is (10) I can run a long way without stopping. An example of a Global Esteem question is (11) Overall, most things I do turn out well.

The following directions are from the PSDQ-S instrument instructions (Marsh, 2009): The PSDQ is designed to be given orally to participants. The participants are instructed to fill in a score sheet with the questions listed on it as the moderator reads each question. The participants are asked not to think too hard about each question and should just circle a response that comes to mind first. The questions are short and as mentioned before, the response choices are on a 1 through 6 point true to false Likert scale which makes this assessment available to use as a survey or e-survey as well as orally.

The questions on the instrument are not ordered by subscale, the subscale questions are mixed throughout the instrument. Following the instructions for the assessment are instructions for scoring the instrument. The following directions are from the PSDQ-S Scoring Instructions (Marsh, 2009). The instructions provide item codes to

distinguish the subscales of the questions. The scoring instructions state, "in order to compute simple scores for each PSDQ-S scale, simply sum responses to items from each scale and divide by the number of items (making sure to reverse score negatively worded items that are denoted by *, before summing responses)" (Marsh, 2009, Appendix E2). The only negatively worded items are on the Health subscale. To find the reverse score, subtract the response from 7 (Marsh, 2009).

Researchers who have used the PSDQ in their research have found that in a comparison of athletes to non-athletes, the athletes had more positive scores on the PSDQ (Simmons & Childers, 2013). A study by Morano et al. (2011) used the PDSQ as part of a battery of test instruments and found that obesity has a negative effect on "motor performance and physical self-perception" (p. 465).

Limited research using multidimensional physical self-concept tools have been employed to study people with disabilities even though disability is considered a multidimensional identity (Shapiro & Martin, 2010). A majority of the research of people with disabilities has been an examination of the participants' self-esteem, thus more of a psychological approach to research in that area (Shapiro & Martin, 2010).

People of all abilities and ages can greatly benefit from PA and PA can, "influence all levels of functioning," such as cognitive, affective, social, emotional, and physical (Shapiro & Martin, 2010, p. 295). Research on the psychological benefits of PA for people with disabilities, "has been cited as a national priority as a means to increasing PA" (Shapiro & Martin, 2010, p. 296).

In an effort to gain insights into the research that has used the PSDQ for athletes with disabilities and youth with disabilities, the purpose of this study is to conduct a systematic review of research that has used the PSDQ to examine athletes and youths with disabilities. The following research questions were asked: (1) Which disability populations have been assessed using the PSDQ and why? (2) Is the PSDQ a good assessment tool to use with the disability population? (3) Which theoretical frameworks have been used and why? (4) How do the researchers interpret the PSDQ data?

Methodology

Protocol

The protocol of this study was a systematic review of published literature guided by the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) (Moher et al., 2015). The review of literature took place during the month of January 2021.

Inclusion and exclusion criteria

Studies were included if they were original research reporting the results of the PSDQ or PSDQ-S in the populations of youth with disabilities and athletes with disabilities. Studies were excluded from the review if they were systematic reviews, reviews of the literature, meta-analyses, or scoping reviews. Citations and books were excluded from the review. Studies published in languages other than English were excluded from review. Studies that were published as conference proceedings and qualitative studies were excluded from review.

Search strategy

To identify eligible studies a systematic search of five electronic databases was conducted. The electronic databases included the following: Google Scholar, PubMed, Science Direct, Scopus, SPORTDiscus, and PsycINFO. All databases were searched from the earliest records to January 2021. Reference lists of previously published studies in the relevant area were searched as well. The main search terms were: PSDQ, or (PSDQ-S, or physical self-description questionnaire, or self-concept, or physical self-concept, or physical self-perception) and disability or (handicap, or impaired, or diseased, or dysfunctional, or difficult, or special need, or additional need, or challenged, or mobility impaired, or mentally impaired, or syndrome) and youth and athletes. The Principal Investigator (PI) and another researcher screened records based on the inclusion criteria by title, abstract, and full text.

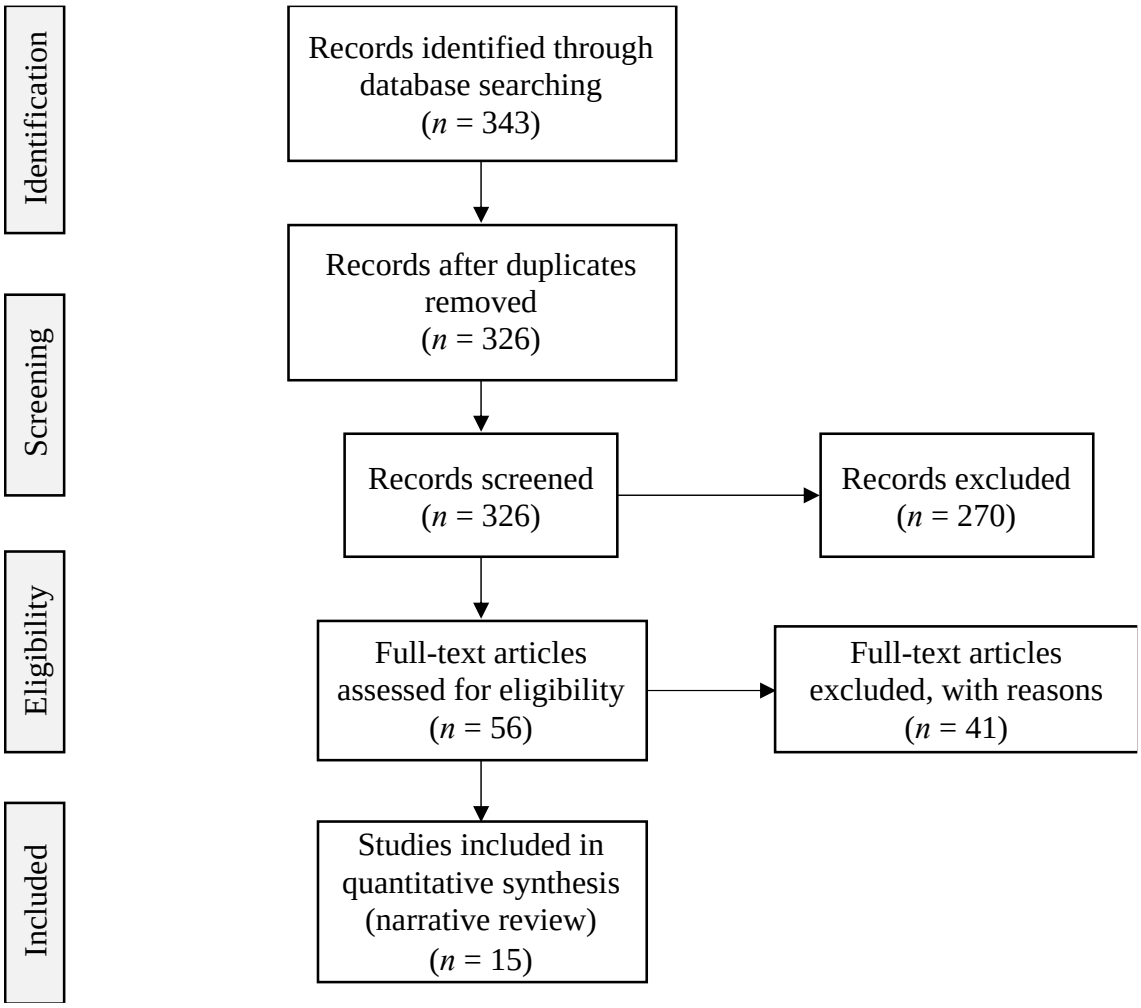
Data extraction and synthesis of results

The PI used a standardized form to extract data from each included study. Data extracted included the following: name of authors, year of publication, study design, method, sample size, country, age, cohort, sex, disability, aim, theory used, key findings, and key outcomes.

Results

Through the systematic search of the literature, 343 citations were identified and are presented in Figure 2. Following the initial search, duplicates were removed, and 326 citations remained. The remaining citations were reviewed for applicability to the focus of this review and 270 citations were excluded. Fifty-six articles were examined

Figure 2 *Prisma Flow Diagram of the Search and Included Studies*



for eligibility in the review therefore, 41 studies were further excluded for the final review. A total of 15 articles met the inclusion criteria and were reviewed for this study.

Study Characteristics

Table 4 presents the characteristics of the included studies that examined youth with disabilities. The number of studies included in Table 4 are 9. The papers were published from 2010 to 2020. Table 5 presents the characteristics of the included studies that examined athletes with disabilities. The number of studies included in Table 5 are 6. The papers were published from 2010 to 2020.

Countries of study

Studies were conducted in the following countries: USA (*n* = 3), Italy (*n* = 2), Jordan (*n* = 2), Iran (*n* = 1), Tunisia (*n* = 1), China (*n* = 1), England (*n* = 1), Belgium (*n* = 1), Hong Kong, (*n* = 1), Taiwan (*n* = 1), and Australia (*n* = 1). All studies were written in English.

Participants

The 15 studies reviewed included 2,740 participants. The ages of the participants ranged from 6 years old to 31 years old. Two studies included children with an average age of 8 and children between the ages of 6 through 10. Five studies included adolescents ranging in age from 12 years; 13-15 years; 15 years; and 12-20 years. Three studies included adolescents and young adults ranging in age from 19 years and 15 to 25 years. One study included young adults and adults with an average age of 26.5.

Table 4 *Studies Investigating the Physical Self-descriptions of Youth with Disabilities* (*n* = 9)

Author(s)	Year	Design *	Method	Sample (n)	Country	Age	Cohort **	Sex ***	Disability ****	Aim	Theory	Key findings	Outcomes
Scarpa	2011	Quan.	Cross.	1149	Italy	19	Adol. & YA	B	SCI & CP	To investigate the role of physical activity and sports participation on physical self-concept and self-esteem in adolescents and young adults with and without physical disability	none	Individuals with physical disability who practiced sport obtained similar results to the people without disability who practiced sport in ten of the eleven PSDQ scales.	Persons with physical disability who practice sport present a positive physical self-concept and good self-esteem.
Yu et al.	2016	Quan.	Cross.	130	China	8	Child	B	DCD	To examine differences in (fundamental movement skills) FMS proficiency, (physical self-concept) PSC, and (physical activity) PA in children with and without DCD and to determine FMS proficiency with PSC.	none	Children with DCD had less proficiency in FMS, less competent in physical coordination, sport ability, and physical health.	Future FMS interventions should emphasize object control skills and physical coordination.
Larkin & Parker	2015	Quan.	Cross.	32	England	13-15	Adol.	B	MLD	To examine the gender differences in self-perception in adolescents with coordination difficulties.	unknown	Girls ranked PA and End. Lower than boys.	Gender differences are different from those in general population.
Oswald & Bo	2020	Quan.	Cross.	13	U.S.A.	12	Adol.	B	ALL	To characterize motor functioning in children with ALL who were treated with chemotherapy and investigate primary, secondary, and tertiary skills.	none	ALL survivors have motor impairments, especially primary, and other cognitive impairments	Future research to examine effect of motor deficits on cognitive and psychosocial functioning in pediatric oncology.
Simons et al.	2014	Quan.	Cross.	208	Belgium	15	Adol.	B	Psychiatric	To evaluate self-esteem and the physical self-concept in adolescents with psychiatric disorders.	none	Self-esteem and physical self-concept were lower in the clinical group than control group.	Physical activity is important for mental health
Chen et al.	2015	Quan.	Cross.	413	Taiwan	12 to 20	Adol.	B	CHD	To examine the relationship between physical self-concept and cardiopulmonary exercise tolerance among adolescents with mild congenital heart disease (CHD).	none	Male participants had better PSDQ scores	Early intervention to promote cardiopulmonary exercise tolerance is needed
Nasstasia et al.	2018	Quan.	assessor blinded, two-arm RCT	34	Australia	15 to 25	Adol. & YA	B	MDD	To investigate the efficacy of an integrated motivational interviewing (MI) and multi-modal exercise intervention in youth with major depressive disorder (MDD).	none	Integrated MI and exercise is effective for the long and short-term treatment of youth with MDD	Increase understanding of the efficacy of integrated MI and exercise for youth with MDD
Sit et al.	2019	Quan.	RCT	131	Hong Kong	6 to 10	Child	B	DCD	To examine the effects of a school-based FMS training program on motor functions, PA and other psychological outcomes.	International Classification of Function, Disability, and health for Children and Youth (ICF-CY)	FMS training resulted in improved FMS proficiency and increased PA and enjoyment of activity participation in children.	School-based FMS training program has the potential to promote physical and psychological health in children with DCD.
Shapiro & Martin	2010	Quan.	Cross.	36	USA	16	Adol.	B	CP, SB, TBI, MD, Heart Condition, Hip Condition	To predict reported PA (physical activity) behavior and self-esteem using a multidimensional physical self-concept model and to describe perceptions of multidimensional physical self-concept among athletes with physical disabilities.	Multidimensional physical self-concept model	Reported mostly positive perceptions of self-esteem, global physical, endurance, body fat, sport competence, strength, flexibility, and physical activity.	Support the value of examining multidimensional physical self-concept as an influence into PA engagement.

Note: *Quant. (Quantitative); RCT (Random Control Trial); **Adol. (Adolescent); Child.(Children); YA.(Young Adult);
***M (Male); F (Female); B (Both Male and Female); ****DCD (Developmental Coordination Disorder); MLD (Motor Learning Difficulties); ALL (Acute Lymphoblastic Leukemia);
CHD (Congenital Heart Disease); VI (Visual Impairment); CP (Cerebral Palsy); TBI (Traumatic Brain Injury), SB (Spina Bifida), MD (Muscular Dystrophy); SCI (Spinal Cord Injury); MDD (Major Depressive Disorder)

Table 5 *Studies Investigating the Physical Self-Descriptions of Athletes with Disabilities* (*n* = 6)

Author(s)	Year	Design *	Method	Sample (n)	Country	Age	Cohort**	Sex ***	Sport	Disability ****	Aim	Theory	Key findings	Outcomes
Martin & Whalen	2012	Quant.	Cross.	50	USA	26.5	YA and Adult	B	unknown	CP, SB, MD, SCI	To describe multidimensional self-concept and to predict both physical activity (PA) and self-esteem using various dimensions of physical self-concept.	Multidimensional self-concept theory	Athletes reported neutral to positive perceptions of multidimensional physical self-concept.	Global physical self-concept and strength self-concept were important in predicting global self-concept and PA.
Qasim et al.	2019	Quant.	Cross.	41	Jordan	31	Adult	M	Basketball	CP, SB, L-L	To investigate physical self-esteem of wheelchair basketball players and to explore correlations among various physical domains and physical self-esteem.	none	Reported positive perceptions across all physical domains	Supports multidimensional construct of physical self-esteem
Qasim et al.	2020	Quant.	Cross.	41	Jordan	31	Adult	M	Basketball	CP, SB, L-L	To investigate exercise self-efficacy, physical self-worth, and global self-esteem levels athletes with physical disabilities.	Exercise and Self-Esteem Model (EXSEM)	Participants had high scores in all three variables	The exercise and self-esteem model concept was not supported
Ghasemi et al.	2010	Quant.	Cross.	150	Iran	unknown	Adult	B	unknown	Multiple	To compare the body image between disabled athletes with disabled and non-disabled non-athletes	unknown	Body image of disabled athletes in sub-scales of power, endurance, coordination, flexibility, self-esteem, athletic competence, and body activity were higher than disabled and non-disabled non-athletes.	Disabled athletes have better body images as compared to the disabled and non-disabled non-athletes.
Scarpa & Palumbo	2017	Quant.	Cross. & RBD	200	Italy	12 to 28	Adol. & Adult	B	wheelchair sports	Congenital and acquired	To examine differences in physical self-concept among athletes with congenital and acquired motor disabilities and assess the influence of age of disability onset on physical self-concept perceptions.	Psychosocial Theory	Participants with acquired physical disabilities had higher physical self-concept scores than those with congenital disabilities. Early onset of disability negatively affected self-esteem and most dimensions of physical self-concept.	Years of sport practice positively influenced physical self-description and self-esteem
Hamrouni et al.	2017	Quant.	Cross.	112	Tunisia	18 to 24	Adult	M	Basketball	SCI	To assess the effect of the practice of basketball on auditory and visual perceptual abilities and the self-esteem among persons with motor disabilities.	None	Team sports contribute to the development of the auditory perception among motor disabled participants.	The practice of sport contributes to a better development of self-esteem among subjects with motor disabilities.

One study included adolescents and adults with an age range of 12 to 28. Three studies included adults ranging in age from 18-24 years and 31 years. Most of the studies used both genders (male and female) in their studies (*n* = 12). Three studies used only male participants. Several studies reported participants' disability diagnoses as multiple disabilities (*n* = 6). The multiple disabilities included CP (Cerebral Palsy), SB (Spina Bifida), MD (Muscular Dystrophy), L-L (Length-Length discrepancy), heart condition, and hip condition. One study reported the participants had physical disabilities. Other disabilities included in the reviewed studies included the following: SCI (spinal cord injury), DCD (developmental coordination disorder), MLD (motor learning disorder), MMD (Motor Movement Disorder), ALL (acute lymphoblastic leukemia), CHD (congenital heart disease), psychiatric, and VI (visual impairment).

Sports

In the studies that specified the study of athletes, the only sport that was specifically identified was basketball (*n* = 3) while the remaining studies identified the participants as athletes but did not identify their sport (*n* = 3).

Study design

The most commonly used study design was cross-sectional (*n* = 12). If a study did not specify the design type, the PI made an educated guess based on the type of study being implemented and most often chose cross-sectional. One study incorporated a

cross-sectional design and randomized block design (RBD). Two studies incorporated a randomized control trial.

Theories

A majority of the studies included in this literature search did not reveal the use of theories to guide their research (n = 10). Five studies included theories to guide their research. Those theories are listed as follows: Multidimensional Self-Concept Theory (MSCT) (n = 2), Exercise and Self-Esteem Model (EXSEM) (n = 1), Psychosocial Theory (n = 1), and International Classification of Function, Disability, and Health for Children and Youth (ICF-CY) (n = 1).

Outcomes

Table 6 presents the PSDQ results of youth with disabilities. Six studies reported scores for most or all eleven PSDQ subscales. Studies were not included in this table if the raw PSDQ scores were not reported. Table 7 presents the PSDQ results of athletes with disabilities. Four studies reported scores for all eleven PSDQ subscales. Studies were not included in this table if the raw PSDQ scores were not reported.

Health

In the studies with populations that included youth with disabilities, the PSDQ Health subscale scores ranged from 3.4 to 5 with an average health score among all six studies of (M = 4.36, SD = 0.54). The studies with populations that included athletes

Table 6 *Summary of PSDQ Results in Mean and Standard Deviation for Youth* (*n* = 6)

Author	PSDQ	Health	Coord	Activity	Body Fat	Sport	GP	Appearance	Strength	Flexibility	Endurance	GE	Note
Scarpa (2011)		5 (1)	4 (1)	4.1 (1.3)	4.3 (1.6)	4.4 (0.9)	4.4 (1.2)	4.2 (1)	4.3 (0.9)	3.9 (1)	4.2 (1.2)	4.9 (0.7)	Sport
Scarpa (2011)		4.7 (1.3)	3 (1.1)	1.9 (0.9)	4 (1.8)	2.7 (1.3)	3.7 (1.3)	3.7 (1.1)	3.2 (1.3)	3 (1.2)	3 (1.4)	4 (1.3)	No Sport
Yu et al. (2016)		4.46 (0.97)	3.96 (1.3)	none	4.04 (1.7)	3.74 (1.5)	4.13 (1.43)	3.86 (1.25)	4.08 (1.21)	4.21 (1.18)	3.61 (1.44)	4.13 (1.14)	
Oswald & Bo (2020)	4.49 (0.78)	3.4 (1.25)	4.89 (1.13)	4.6 (1.43)	4.9 (1.08)	4.75 (1.38)	5.01 (1.32)	4.05 (1.25)	4.72 (1.23)	3.84 (1.67)	4.1 (1.25)	5.11 (0.74)	
Simons et al. (2014)		4.32 (1.1)	3.79 (1.09)	3.29 (1.55)	4.08 (1.5)	3.78 (1.52)	3.64 (1.64)	3.32 (1.44)	3.82 (1.31)	3.64 (1.35)	3.28 (1.53)	3.74 (1.36)	
Chen et al. (2015)		4.3 (0.76)	none	3.17 (1.1)	3.96 (1.33)	3.42 (1.04)	3.65 (0.64)	3.73 (0.88)	3.3 (0.95)	3.44 (1.05)	2.91 (1.05)	4.37 (0.82)	
Shapiro & Martin (2010)				3.9 (1.4)	5.6 (0.52)	4.9 (0.88)	5.3 (0.65)		4.8 (0.94)	3.6 (1.1)	4.1 (1.3)	5.5 (0.41)	
Range		3.4 - 5	3 - 4.89	1.9 - 4.6	3.96 - 5.6	2.7 - 4.9	3.64 - 5.3	3.32 - 4.2	3.2 - 4.8	3 - 4.21	2.91 - 4.2	3.74 - 5.11	
Mean (Stan. Dev.)		4.36 (0.54)	3.27 (1.71)	3.49 (.94)	4.41 (0.62)	3.95 (0.78)	4.26 (0.67)	3.81 (0.31)	4.03 (0.63)	3.66 (0.38)	3.6 (0.55)	4.53 (0.65)	

Note: Coor (Coordination); GP (Global Physical); GE (Global Esteem)

Table 7 *Summary of PSDQ Results in Mean and Standard Deviation for Athletes* (*n* = 4)

Author	PSDQ	Health	Coord	Activity	Body Fat	Sport	GP	Appearance	Strength	Flexibility	Endurance	GE
Martin & Whalen (2012)		4.6 (1.1)	3.7 (1.4)	3.4 (1.4)	4.6 (1.5)	4.2 (1.4)	4.8 (1.4)	5.1 (1)	4.1 (1.5)	3.3 (1.6)	3.2 (1.6)	5.9 (1)
Qasim et al. (2019)		4.11 (0.557)	4.24 (1.346)	3.86 (1.128)	4.7 (1.28)	4.3 (1.229)	4.41 (0.953)	4.75 (1.044)	4.3 (1.079)	4.39 (1.229)	4.31 (1.264)	4.93 (1.081)
Scarpa & Palumbo (2017)		5.01 (1)	4.18 (0.97)	3.83 (1.36)	4.02 (1.66)	4.26 (0.98)	4.5 (1.14)	4.24 (0.96)	4.21 (0.85)	4.36 (0.98)	4.34 (1.22)	5.22 (0.73)
Qasim et al. (2020)	4.41 (.953)											
Range		4.11 - 5.01	3.7 - 4.24	3.4 - 3.86	4.02 - 4.7	4.2 - 4.3	4.41 - 4.8	4.24 - 5.1	4.1 - 4.3	3.3 - 4.39	3.2 - 4.34	4.93 - 5.9
Mean (Stand. Dev.)		4.57 (0.45)	4.04 (0.3)	3.7 (0.26)	4.44 (0.37)	4.25 (.05)	4.57 (0.2)	4.7 (0.43)	4.2 (0.1)	4.02 (0.62)	3.95 (0.65)	5.35 (0.5)

Note: Coor (Coordination); GP (Global Physical); GE (Global Esteem)

with disabilities, the PSDQ Health subscale scores ranged from 4.11 to 5.01 with an average health score among all three studies of (M = 4.57, SD = 0.45).

Coordination

The PSDQ Coordination subscale results for the youth with disabilities population ranged from 3 to 4.89 with a mean and standard deviation of (*M* = 3.27, *SD* = 1.71). The Coordination subscale results for athletes with disabilities ranged from 3.7 to 4.24 with a mean and standard deviation of (*M* = 4.04, *SD* = 0.3).

Activity

The PSDQ Activity subscale results for youth with disabilities ranged from 1.9 to 4.6 with a mean and standard deviation of (*M* = 3.49, *SD* = 0.94). The Activity subscale results for athletes with disabilities ranged from 3.4 to 3.86 with a mean and standard deviation of (*M* = 3.7, *SD* = 0.26).

Body Fat

The PSDQ Body Fat subscale results for youth with disabilities ranged from 3.96 to 5.6 with a mean and standard deviation of (*M* = 4.41, *SD* = 0.62). The Body Fat subscale results for athletes with disabilities ranged from 4.02 to 4.7 with a mean and standard deviation of (*M* = 4.44, *SD* = 0.37).

Sport

The PSDQ Sport subscale results for youth with disabilities ranged from 2.7 to 4.9 with a mean and standard deviation of (*M* = 3.95, *SD* = 0.78). The Sport subscale

results for athletes with disabilities ranged from 4.2 to 4.3 with a mean and standard deviation of (*M* = 4.25, *SD* = 0.05).

Global Physical

The PSDQ Global Physical subscale results for youth with disabilities ranged from 3.64 to 5.3 with a mean and standard deviation of (*M* = 4.26, *SD* = 0.67). The Global Physical subscale results for athletes with disabilities ranged from 4.41 to 4.8 with a mean and standard deviation of (*M* = 4.57, *SD* = 0.2).

Appearance

The PSDQ Appearance subscale results for youth with disabilities ranged from 3.32 to 4.2 with a mean and standard deviation of (*M* = 3.81, *SD* = 0.31). The Appearance subscale results for athletes with disabilities ranged from 4.24 to 5.1 with a mean and standard deviation of (*M* = 4.7, *SD* = 0.43).

Strength

The PSDQ Strength subscale results for youth with disabilities ranged from 3.2 to 4.8 with a mean and standard deviation of (*M* = 4.03, *SD* = 0.63). The Strength subscale results for athletes with disabilities ranged from 4.1 to 4.3 with a mean and standard deviation of (*M* = 4.2, *SD* = 0.1).

Flexibility

The PSDQ Flexibility subscale results for youth with disabilities ranged from 3 to 4.21 with a mean and standard deviation of (*M* = 3.66, *SD* = 0.38). The Flexibility

subscale results for athletes with disabilities ranged from 3.3 to 4.39 with a mean and standard deviation of (M = 4.02, SD = 0.62).

Endurance

The PSDQ Endurance subscale results for youth with disabilities ranged from 2.91 to 4.2 with a mean and standard deviation of (M = 3.6, SD = 0.55). The Endurance subscale results for athletes with disabilities ranged from 3.2 to 4.34 with a mean and standard deviation of (M = 3.95, SD = 0.65).

Global Esteem

The PSDQ Global Esteem subscale results for youth with disabilities ranged from 3.74 to 5.11 with a mean and standard deviation of (M = 4.53, SD = 0.65). The Global Esteem subscale results for athletes with disabilities ranged from 4.93 to 5.9 with a mean and standard deviation of (M = 5.35, SD = 0.5).

Discussion

The objectives of this study were to conduct a systematic review of research that has used the Physical Self-Description Questionnaire (PSDQ) to examine athletes and youths with disabilities. The following research questions were asked: (1) Which disability populations have been assessed using the PSDQ and why? (2) Is the PSDQ a good assessment tool to use with the disability population? (3) Which theoretical frameworks have been used and why? (4) How do the researchers interpret the PSDQ data?

Research Question One

The disabilities included in the research in this review were the following: Acute Lymphoblastic Leukemia (ALL), Congenital Heart Disease (CHD), Major Depressive Disorder (MDD), Developmental Coordination Disorder (DCD), psychiatric diagnoses, Spinal Cord Injury (SCI), Cerebral Palsy (CP), leg-length discrepancies, Spina Bifida (SB), Muscular Dystrophy (MD), TBI (Traumatic Brain Injury), heart condition, hip condition, and Motor Learning Difficulties (MLD).

Some of the disabilities were less well-known than others. The lesser-known disabilities are defined below:

1. Acute lymphoblastic leukemia (ALL) is a "malignant disorder that originates in the lymphoid cells in bone marrow and can permeate throughout the body and central nervous system" (Oswald & Bo, 2020, p. 597).
2. Major Depressive Disorder (MDD) is, "highly prevalent in youth," and has a diverse profile of symptoms including comorbid eating, anxiety, substance use disorders, and risk of suicide" (Nasstasia et al., 2018, p. 13).
3. Developmental Coordination Disorder (DCD) is found in children with "movement difficulties that interfere with their daily activities, academic achievement or health, in the absence of any known medical condition or neurological impairment" (Sit et al., 2019, p. 2).
4. Psychiatric disorders included the following: mood disorder, behavior disorder, identity problems, developmental disorders, post-traumatic stress

disorder (PTSD), attention deficit hyperactivity disorder (ADHD), and parent issues.

5. Motor learning difficulties are found in children who are unable to perform basic movement skills and cannot fully participate in PA (Hands & Larkin, 2006).

The following discussion will provide possible reasons for why researchers chose to study certain disability populations and provide context into the sample choices. Some studies explicitly stated their reasons while others provided more nuanced explanations.

Research by Hamrouni et al. (2017) and Scarpa (2011) specifically studied individuals with SCI. The aim of Hamrouni et al.'s (2017) study was to determine the effect of basketball practice on auditory and visual perceptual abilities and self-esteem among men with SCI. The sample population was chosen by the authors because motor activities such as wheelchair basketball can improve a person's well-being (Hamrouni et al., 2017). Further, the researchers surmised that the practice of, "Adapted physical activities (APA) can promote self-esteem," through successful sports experiences (Hamrouni et al., 2017, p. 320).

Scarpa (2011) chose to sample people with SCI because individuals with disabilities often "receive negative feedback about their bodies and have a poor body image" (p. 39). The author found that individuals with disabilities have been shown to have negative Physical Self-Concept (PSC) but athletes with disabilities have higher levels of PSC (Scarpa, 2011).

Yu et al. (2016); Sit et al. (2019); and Larkin and Parker (2015) sampled participants with motor learning difficulties and DCD which present similarly and will be combined in this discussion. DCD was chosen by Yu et al. (2016) and Sit et al. (2019) because research has shown that children with DCD have poor performance of motor skills. The researchers examined activity and participation among children with DCD and have found that PSC is an important correlation of Fundamental Movement Skills (FMS) proficiency in children (Sit et al., 2019; Yu et al., 2016) Larkin and Parker (2015) wanted to examine gender differences in PSC.

Six studies examined populations with multiple disabilities. CP and SB were listed as part of the multiple disabilities in four of the studies. The study by Martin and Whalen (2012) chose to study multiple disabilities because individuals with disabilities have less PA but can greatly benefit from it in physiological and psychological domains. The study by Qasim et al. (2019) echoed the same reasoning as Martin and Whalen (2012) and also gave the limited research on PSC of athletes with disabilities as further reasoning for embarking on the study. Another study by Qasim et al. (2020) chose the study population because of limited research that has examined the Exercise and Self-Esteem Model (EXSEM) on individuals with disabilities. The study by Shapiro and Martin (2010) studied youth athletes with disabilities because youth with disabilities "often lack competence in PA," (p. 298).

Scarpa and Palumbo (2017) chose to study populations of people with acquired or congenital disabilities because they found that no studies have focused on differences in PSC among this particular population.

Oswald and Bo (2020) researched children with ALL because recent research has revealed that following treatment, ALL survivors exhibit impaired motor functioning. The PSDQ was used as part of the study to determine motor functioning.

The study by Simons et al. (2014) researched children with various psychiatric diagnoses because in adolescence, bodies are changing, and that change could affect physical and self-esteem. The authors used the PSDQ to examine PSC and self-esteem because they found that most research only examines self-esteem (Simons et al., 2014).

Chen et al. (2015) researched children with CHD because "some adolescents have cardiac defects that may result in significant challenges to positive body image," because of activity and exercise capacity restrictions (ps. 206-207). Plus, the authors found that little is known about this populations' views on PSC and used the PSDQ to find the answer (Chen et al., 2015).

Nasstasia et al. (2018) researched children with MDD because exercise has been shown to be an effective treatment however, little is known about the, "impact of exercise on depressive symptoms (cognitive, somatic, affective, etc.)" (p. 14). The PSDQ was used in this study to report on the impact of exercise on this population (Nasstasia et al., 2018).

Research Question Two

An indicator of a good assessment tool would be positive statements by the researchers regarding the efficacy of the tool. An indicator of a bad assessment tool would be negative statements by the researchers such as, "this tool did not work with this population," or "this assessment did not measure what we thought it would measure," or

"we did not learn anything about our population using this tool." This review yielded all positive results. The PI did not find any negative statements towards the PSDQ in any of the reviewed literature.

Therefore, the following discussion will highlight the positive aspects of the PSDQ that the researchers in this review found and some of their key findings.

Scarpa (2011) found that the PSDQ results enabled the researchers to determine that athletes with and without disabilities had similar results in ten out of the eleven scales. Plus, Scarpa (2011) found that athletes with disabilities perceive themselves to be stronger than athletes without disabilities.

Yu et al. (2016) using the PSDQ to determine PSC enabled the researchers to confirm their hypothesis that children with DCD have significantly poorer PSC than children without DCD. The study by Larkin and Parker (2015) allowed the researchers to utilize the PSDQ and determine that girls with MLD ranked PA and endurance lower than boys. The PSDQ helped researchers Oswald and Bo (2020) conclude that ALL patients display significant impairments in motor ability.

Simons et al. (2014) definitively concluded that the PSDQ, "appears to be a reliable instrument," for the sample population of pediatric psychiatric disabilities. The authors found that the non-clinical control group scored higher on all scales (which was predicted) and that the lower self-esteem and PSC scores was an accurate prediction of the target population making this study relevant to practitioners (Simons et al., 2014).

Chen et al. (2015) found that the PSDQ was useful to show measures of self-esteem, health, and body fat in their study of children with CHD. The study by Nasstasia

et al. (2018) is confident that their trial will provide valuable insights into the "Impact of exercise on depressive symptoms" (p. 14). The study by Shapiro and Martin (2010) found that the PSDQ helps to support the value of examining multidimensional PSC as an influence into PA engagement among people with physical disabilities.

Martin and Whalen (2012) found that the PSDQ subscales of Global Physical and Strength were important to predict global self-concept and PA in individuals with multiple disabilities. The study by Qasim et al. (2019) concluded that relatively high perceptions of the PSDQ were observed across all domains among their participants with multiple disabilities. Qasim et al. (2020) observed that the study sample of persons with multiple disabilities reported high physical self-worth and that self-efficacy is significantly related to physical self-worth.

The study by Ghasemi et al. (2010) found that the PSDQ revealed that athletes with multiple disabilities have a better body image than disabled and non-disabled non-athletes. Scarpa and Palumbo (2017) confirmed their hypothesis using the PSDQ that people with acquired disabilities score higher on measures of PSC than people with congenital disabilities. The study by Hamrouni et al. (2017) found that the PSDQ allowed them to determine that wheelchair basketball players with SCI have a positive physical self-esteem value. The study by Shapiro and Martin (2010) found that the PSDQ helped to determine that sample population with disabilities had "moderate to strong perceptions of physical self-concept" (p. 302).

Research Question Three

This review revealed the use of five studies that used guiding theories: the Exercise and Self-Esteem Model (EXSEM), the Multidimensional Self-Concept Theory, the International Classification of Function, Disability, and Healthy for Children and Youth (ICF-CY), and the Psychosocial Theory. Ten studies in this review did not use a theory or were not explicit in their use of a theory in the text of their study.

Qasim et al. (2020) used the EXSEM that was developed by Sonstroem et al. (1994) in an effort to help researchers understand the link between exercise engagement and self-esteem (Qasim et al., 2014). Further, the model, "suggests that exercise engagement enhances exercise self-efficacy, which leads to better physical self-worth," (p. 47). The EXSEM was used by Qasim et al. (2020) because it appears to, "be the most acceptable model among researchers," (p. 47). Therefore, Qasim et al. (2020) used the EXSEM in their study to determine the effects of wheelchair basketball on exercise self-efficacy, physical self-worth, and global self-esteem among athletes with disabilities.

Sit et al. (2019) used the ICF-CY model because it has been used in DCD research in past studies. The model classifies human functioning into body functions and structure, activity limitation, and participation restriction (Sit et al., 2019). The authors utilized this model because it suggests that individuals can be more involved in life activities if they participate in interventions that target the development of their functions such as Fundamental Movement Skills (FMS) (Sit et al., 2019). Further, this model has not been extensively used to study "Activity and participation in children with DCD,"

and is the reason the authors chose to use it (Sit et al., 2019, p. 2). The author's concluded by found that the model was useful for their study (Sit et al., 2019).

The Psychosocial theory was used by Scarpa and Palumbo (2017) study, that was based on Campbell's (1995) work showing that athletes in wheelchairs with acquired disabilities had a higher sense of well-being when compared with athletes with congenital disabilities. The research by Scarpa and Palumbo (2017) confirmed Campbell's (1995) finding.

The Multidimensional self-concept theory was used by Martin and Whalen (2012) and Shapiro and Martin (2010). The theory posits that, "people have discrete physical self-concepts across different domains" (Martin & Whalen, 2012, p. 197). For example, a person with Cerebral Palsy may perceive himself as having strong sport competence but low coordination and is thus the reason for using this theory when predicting PA in adults with disabilities (Martin & Whalen, 2012). The study by Shapiro and Martin (2010) viewed having a disability as a multidimensional identity and thus employed the use of this theory and the PSDQ to examine adolescents with disabilities.

Research Question Four

Consistent with this review's findings from research question three, all of the reviewed studies reported positive or high PSDQ results for their sample populations with the exceptions of the study by Yu et al. (2016) which found low results but confirmed their hypothesis that children with DCD would not have high results on PSC and the study by Oswald and Bo (2020) which found that ALL patients had significantly lower PSDQ scores than the control group.

For example, Yu et al. (2016) stated that, “higher scores represent better physical concept in the specific area” (p. 46). The study by Chen et al. (2015) found that males scored higher and determined this to be a positive result. The study by Sit et al. (2019) explicitly states that, “higher scores represented better perceived competence,” and provides a correct synopsis to how PSDQ scores are interpreted, that higher scores are better scores (p. 4).

However, are “high” scores on the PSDQ really considered good? The study by Scarpa (2011) considered scores of 4 to be good or positive. The study by Simons et al. (2014) determined for their research that a higher PSDQ score is a better score. The studies by Martin and Whalen (2012), Scarpa and Palumbo (2017), and Shapiro and Martin (2010) echoed the score interpretation by Simons et al. (2014) that a high score is a good score.

At present, a review of the literature and of Marsh’s work has not revealed any score interpretation or normative tables to help distinguish what connotes a good score from a bad score. Researchers have considered high scores to be good scores but is that the correct interpretation (Yu et al., 2016)? The Principal Investigator (PI) of this systematic review took the PSDQ to elicit all good or positive scores. Based on the wording of the questions and reverse scoring of the Health subscale, the PI created a scale to interpret the results. Table 8 presents a possible score interpretation.

Therefore, based on Table 8 high scores in most areas of the PSDQ are not actually positive or good scores. A low score on the Body Fat subscale may indicate someone has an unhealthy body composition. A high score on the Health subscale may

Table 8 *PSDQ Score Interpretation*

Subscale	Good Result
Health	-1
Coordination	1
Activity	1
Body Fat	6
Sport	1
Global	
Physical	1
Appearance	1
Strength	1
Flexibility	1
Endurance	1
Global Esteem	3

indicate someone has poor health conditions. If Table 8 were adopted by future researchers than a high PSDQ score is not necessarily a good score.

Included in this discussion is also a guide as to best practices for presenting the data for the PSDQ scores. In order for future researchers to use past PSDQ scores as a comparison mechanism to enhance their own research, a best practice is to provide a descriptive table that lists the mean and standard deviation of each subscale and provide a total PSDQ score. The study by Oswald and Bo (2020) was the only study in this review that included a total PSDQ score. The following studies provided a descriptive table for the PSDQ results: Scarpa (2011), Simons et al. (2014), Martin and Whalen (2012), Qasim et al. (2019), and Scarpa and Palumbo (2017).

Qasim et al. (2020) did not include a PSDQ descriptive table and only displayed an analysis of correlations between covariates. The study by Hamrouni et al. (2017) included an appropriate discussion about how to score the PSDQ but then presented the PSDQ results on a bar graph with a 20-60 scale. The PSDQ questionnaire is on a 1-6 scale so an interpretation of the PSDQ results from Hamrouni et al.'s (2017) was not possible.

Youth with Disabilities and Athletes with Disabilities

The PI has conducted previous research on the PSDQ and youth athletes with disabilities. During this systematic review, the PI thought that youth athletes with disabilities may have more similar PSDQ results to athletes with disabilities than with non-athlete youths with disabilities. That is the reason for the categorical display of information in this systematic review.

Future Research

At present, a table of norms for PSDQ values does not exist. The lack of a table of norms can inhibit comparison studies and also hinder a meaningful interpretation of the results for each participant and for the group of respondents. Therefore, future research should establish a PSDQ table of norms for a variety of populations which would include youths, youths with disabilities, adults, adults with disabilities, seniors and seniors with disabilities. A future systematic review should review all of the studies that have used the PSDQ for people with disabilities in order to help create a PSDQ table of norms.

Future research should also address a protocol for scoring and reporting PSDQ scores so that future researchers can feel confident in their PSDQ values and also feel confident in the presentation of the values for comparisons and future research.

Studies by Marsh (1993), Marsh (1996), Marsh et al. (1994), Marsh et al. (1997) have extensively researched the validity and reliability of the PSDQ among children without disabilities. Future research should be done to determine validity and reliability of the PSDQ with children with disabilities and with adults with disabilities.

Limitations

A limitation of this study was a lack of access to every journal article published on this subject. Plus, a lack of access to every search engine available in the world. A further limitation was an inability to translate or find translated articled that were found and could have been included in this systematic review. Another limitation and perhaps a note to researchers is that search engines pick up on key words and if a study used the

PSDQ but did not include the PSDQ in the title or abstract of the study, the search engine most likely would not pick up the study in the search results. A limitation of this study was the lack of research assistants or software for meta-analyses because this project was done as a graduate student thesis. A limitation of this study is that the focus of the review may have been too narrow and thus resulted in a low number of reviewed studies.

Conclusion

Although the PSDQ assessment has been available for use since 1996, the results of this systematic review show that a majority of the studies who have used the PSDQ study people with disabilities have been completed in recent years. All of the studies reviewed in this study were published after the year 2000. Most of the studies were published around the year of 2015 and two studies were published in 2020. This shows that the PSDQ is still a fairly new tool to use to study people with disabilities. This review found that the PSDQ is a useful tool to use to study the PSC of athletes and youths with disabilities. In order to support future work of researchers in this area, a score interpreting and reporting protocol along with a PSDQ table of norms is warranted. This study promotes the continued use of the PSDQ in a variety of populations especially among persons with disabilities.

In light of the Covid-19 Pandemic, researchers are tasked with finding ways to conduct research in a non-invasive and even in no-contact environments. The PSDQ presented in e-survey format can allow researchers to continue to conduct research in this vital area to advance the efforts to provide more PA opportunities for people with disabilities.

References

Barwick, R.B., Tillman, M.D., Stopka, C.B., Dipnarine, K., Delisle, A., and Sayedul Huq, M. (2012). Physical capacity and functional abilities improve in young adults with intellectual disabilities after functional training. *Journal of Strength and Conditioning Research*, 26(6), 1638-1643.

Carroll, D.D., Courtney-Long, E.A., Stevens, A.C., Sloan, M.L., Lullo, C., Visser, S.N., Fox, M.H., Armour, B.S., Campbell, V.A., Brown, D.R., Dorn, J.M. (2014, May 9). *Vital signs: Disability and physical activity – United States, 2009-2012*. Morbidity and Mortality Weekly Report (MMWR) from Centers for Disease Control and Prevention (CDC). 63(13), [online content]. Retrieved from https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6318a5.htm

Campbell, E. (1995) Psychological well-being of participants in wheelchair sports: Comparison of individuals with congenital and acquired disabilities. *Perceptual and Motor Skills*, 81, 563-568.

Centers for Disease Control and Prevention (CDC), *Disability & Health Data System (DHDS)*. (2019, November 18). [online content]. Retrieved from https://www.cdc.gov/ncbddd/disabilityandhealth/documents/DHDS_FactSheet-508.pdf

Centers for Disease Control and Prevention (CDC). (2019, February 4). *About Physical Activity*. https://www.cdc.gov/physicalactivity/about-physical-activity/pdfs/healthy-strong-america-201902_508.pdf

Chen, C., Su, W., Wang, J., Yang, H., Chiang, Y., and Moons, P. (2015). Physical self-concept and its link to cardiopulmonary exercise tolerance among adolescents with mild congenital heart disease. *European Journal of Cardiovascular Nursing,* 14(3), 206-213.

Dahlgren, W.J., Boreskie, S., Dowds, M., MacTavish, J.B., Watkinson, E.J. (1991). The Medallion Program: Using the generic sports model to train athletes with mental disabilities. *Journal of Physical Education, Recreation, and Dance*, November, 67-73.

Faigenbaum, A.D., MacDonald, J.P., Carvalho, C., and Rial Rebullido, T. (2020). The pediatric inactivity triad: a triple jeopardy for modern day youth. *ACSM's Health and Fitness Journal*, 24(4), 10-17.

Ghasemi, A., Momeni, M., and Khankeh, H.R. (2010). Comparison of body image between disabled athletes, disabled non-athletes and non-disabled non-athletes males. *Archives of Rehabilitation*, 10(4), Abstract.

Hamrouni, S., Hassen, S.B., Sofiene, K., Lagha, S., Alem, J. (2017). Effects of the practice of team sport or individual sport on perceptual abilities and on the self-esteem in the persons with motor disability: A comparative study. *Advances in Physical Education*, 7, 319-331.

Hands, B., and Larkin, D. (2006). Physical fitness differences in children with and without motor learning difficulties. *European Journal of Special Needs Education*, 21(4), 447-456.

Larkin, D., and Parker, H.E. (1997). Gender differences in physical self-descriptions of adolescents with a history of motor learning difficulties. *The Educational and Developmental Psychologist*, 14(1), 63-71

Machek, M.A., Stopka, C.B., Tillman, M.D., Sneed, S.M., and Naugle, K.E. (2008). The effects of a supervised resistance-training program on Special Olympics athletes. *Journal of Sport Rehabilitation*, 17, 372-379.

Marsh, H.W. (1993). Physical fitness self-concept: relations to field and technical indicators of physical fitness for boys and girls aged 9-15. *Journal of Sport & Exercise Psychology*, 15, 184-206.

Marsh, H.W. (1996). Construct validity of physical self-description questionnaire responses: relations to external criteria. *Journal of Sport and Exercise Psychology*, 18, 111-131.

Marsh, H.W., Richards, G.E., Johnson, S., Roche, L., and Tremayne, P., (1994). Physical Self-Description Questionnaire: Psychometric properties and a multitrait-multimethod analysis of relations to existing instruments. *Journal of Sport & Exercise Psychology*, 16, 270-305.

Marsh, H.W., Hey, J., Roche, L.A., and Perry, C. (1997). The structure of physical self-concept: Elite athletes and physical education students. *Journal of Educational Psychology*, 89, 369–380.

Marsh, H.W., Martin, A.J., Jackson, S. (2010). Introducing a short version of the physical self-description questionnaire: new strategies, short-form evaluative

criteria, and applications of factor analyses. *Journal of Sport and Exercise Psychology*, 32, 438-482.

Martin, J.J. (2006). Psychosocial aspects youth disability sport. *Adapted Physical Activity Quarterly*, 23(1), 65-77.

Martin, J.J., and Whalen, L. (2012). Self-concept and physical activity in athletes with physical disabilities. *Disability and Health Journal*, 5, 197-200.

Mayorga-Vega, D., Viciana, J.V., Cocca, A., and Villen, B.R. (2012). Effect of physical fitness program on physical self-concept and physical fitness elements in primary school students. *Perceptual & Motor Skills: Exercise & Sport*, 115(3), 984-996.

Millar, L.A. (2016, November). *ACSM FIT Society Page*. American College of Sports Medicine, 18(3), 1-6.

Moher, D., Shamseer, L., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., Shekelle, P., Stewart, L.A., and PRISMA-P Group. (2015). Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic Reviews Journal*, 4(1).

Morano, M., Collela D., Robazza, C., Bortoli, L., Caprinica, L. (2011). Physical self-perception and motor performance in normal-weight, overweight, and obese children. *Scandinavian Journal of Medicine & Science in Sports*, 21, 465-473.

Murphy, N.A., Carbone, P.S., and the Council on Children with Disabilities. (2008). Promoting the participation of children with disabilities in sports, recreation, and physical activities. *Pediatrics*, 121(5), 1057-1061.

Nasstasia, Y., Baker, A.L., Halpin, S.A., Hides, L., Lewin, T.J., Kelly, B.J., and Callister, R. (2018). Evaluating the efficacy of an integrated motivational interviewing and multi-modal exercise intervention for youth with major depression: Healthy body, healthy mind randomized controlled trial protocol. *Contemporary Clinical Trials Communications*, 9, 13-22.

Oswald, K.A., and Bo, J. (2020). Motor functioning and associated cognitive outcomes in pediatric survivors of acute lymphoblastic leukemia. *Child Neuropsychology*, 26(5), 597-611.

Pastula, R.M., Stopka, C.B., Delisle, A.T., and Hass, C. J. (2012). Effect of moderate-intensity exercise training on the cognitive function of young adults with Intellectual Disabilities. *Journal of Strength and Conditioning Research*, 26(12), 3441-3448.

Presidential Youth Fitness Program (PYFP). (2019, November 18). *Inclusive approaches to physical education* (one-pager). [online content]. Retrieved from https://pyfp.org/storage/app/media/documents/inclusive_approaches_to_physical_education.Pdf

Peart, N.D., Marsh, H.W., and Richards, G.E. (2005). *The physical self-description questionnaire: furthering research linking physical self-concept, physical activity, and physical education.* Paper presented at American Association for Research in Education.

Qasim, S., Telfah, Y., and Haddad, Y. (2019). Physical self-esteem of wheelchair basketball players. *Acta Gymnica*, 49(1), 3-9.

Qasim, S.H., Telfah, Y., Haddad, Y., and AbuMoh'd, M.F. (2020). Does the exercise and self-esteem model work on wheelchair basketball players? *Sport Mont*, 18(1), 47-51.

Rimmer, J.H., and Kelly, L.E. (1991). Effects of a resistance training program on adults with mental retardation. *Adapted Physical Activity Quarterly*, 8, 146-153.

Scarpa, S. (2011). Physical self-concept and self-esteem in adolescents and young adults with and without physical disability: the role of sports participation. *European Journal of Adapted Physical Activity*, 4(1), 38-53.

Scarpa, S., and Palumbo, C. (2017). Physical self-concept in athletes with congenital versus acquired disabilities. *Italian Journal of Sports Pedagogy*, 2, 1-15.

Shapiro, D.R., and Martin, J.J. (2010). Multidimensional physical self-concept of athletes with physical disabilities. *Adapted Physical Activity Quarterly*, 27(4), 294-307.

Simmons, S. and Childers, K. (2013). Effects of intercollegiate athletes and intramural participation on self-esteem and physical self-description: a pilot study. *Recreational Sports Journal*, 37, 160-168.

Simons, J., Adriaenssens, P., Delbroek, H., and Probst, M. (2014). Self-esteem and physical self-concept in adolescents on an emergency psychiatric unit. *European Psychomotricity Journal*, 6(1), 37-51.

Sit, C.H., Yu, J.J., Wong, S.H., Capio, C.M., and Masters, R. (2019). A school-based physical activity intervention for children with developmental coordination disorder: A randomized controlled trial. *Research in Developmental Disabilities*, 89, 1-9.

Sonstroem, R.J., Harlow, L.L., Josephs, L. (1994). Exercise and self-esteem: Validity of model expansion and exercise associations. *Journal of Sport and Exercise Psychology*, 16, 29-42.

Steptoe, A., and Butler, N. (1996). Sports participation and emotional wellbeing in adolescents. *The Lancet*, 347, 1789-1792.

Stopka, C., Limper, L., Siders, R., Graves, J., Goodman, A., and Silverstone, E. (1994). Effects of a supervised resistance training program on adolescents and young adults with Mental Retardation. *Journal of Strength and Conditioning Research*, 8(3), 184-187.

Stopka, C.B., Zambito, K.L., Suro, D.G., Pearson, K.S., Siders, R.A., and Goff, B.H. (1998). Muscular endurance and physical capacity to perform work of adolescents with Mental Retardation. *Journal of Sport Rehabilitation*, 197-205.

Stopka, C., Morley, K., Siders, R., Schuette, J., Houck, A., and Gilmet, Y. (2002). Stretching techniques to improve flexibility in Special Olympics athletes and their coaches. *Journal of Sport Rehabilitation*, 11, 22-34.

Tamse, T.R., Tillman, M.D., Stopka, C.B., Weimer, A.C., Abrams, G.L., and Issa, I.M. (2010). Supervised moderate intensity resistance exercise training improves strength in Special Olympics athletes. *Journal of Strength and Conditioning Research*, 24(3), 695-700.

U.S. Department of Health and Human Services (HHS), Office of the Surgeon General. (2019, November 18). *Executive summary from step it up! Surgeon General's call to action.* [online content]. Retrieved from

https://www.hhs.gov/surgeongeneral/reports-and-publications/physical-activity-nutrition/walking-executive-summary/index.html

Yu, J., Sit, C.H.P., Capio, C.M., Burnett, A., Ha, A.S.C., Huang, W.Y.J. (2016). Fundamental movement skills proficiency in children with developmental coordination disorder: does physical self-concept matter? *Disability and Rehabilitation*, 38(1), 45-51.

Conclusion

The pilot study used the Health through Sport Model to determine that youth wheelchair basketball players have a positive physical self-perception and enjoy their sport. The systematic review of the Physical Self-Description Questionnaire (PSDQ) among athletes and youth with disabilities found the PSDQ to be a useful assessment to study physical self-perception among people with disabilities.

Vita

Originally from West Virginia, Coleen Martinez grew up in Bluefield, West Virginia. After high school, she attended the New World School of the Arts in Miami, Florida and received an Associates of Arts degree in Dance. Following her AA degree, Ms. Martinez attended the University of Florida in Gainesville, Florida and received a Bachelor of Science degree in Exercise Science and a Master of Science degree in and Health Education & Behavior with a specialization in Adapted Physical Activity. Ms. Martinez chose to attend the University of Tennessee, Knoxville to pursue a Master of Science degree in Therapeutic Recreation. Her research interest includes study the benefits and effects of adapted sports and physical activity. Ms. Martinez completed her Therapeutic Recreation internship at the Patricia Neal Rehabilitation Center in Knoxville, Tennessee. Ms. Martinez is married to Oscar Martinez and has two children, Josh and Willie.