

THE IMPACT OF A TEACHER-DEVELOPED PHYSICAL FITNESS PROGRAM  
ON THE SELF-PERCEPTION AND BASKETBALL SKILLS OF TWO HIGH  
SCHOOL STUDENTS

By

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## ABSTRACT

### THE IMPACT OF A TEACHER-DEVELOPED PHYSICAL FITNESS PROGRAM ON THE SELF-PERCEPTION AND BASKETBALL SKILLS OF TWO HIGH SCHOOL STUDENTS

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**PURPOSE:** This study has two purposes: (a) to determine the effect of a teacher-developed physical fitness program on the performance of specific participant goals for the game of basketball and (b) to determine the impact of this same program on the overall perception of the participants amongst their peers when participating in the game of basketball. **METHODS:** The participants in this study included two high school males. Participant 1 had diagnosis of attention deficit hyperactivity disorder (ADHD) and was provided services through a 504 plan. This study occurred over a 5-week period, including a 5-week intervention, with the pre and post assessments taking place in the 1<sup>st</sup> and 5<sup>th</sup> week. Additionally, participants were surveyed prior to the study taking place and on the last day of the study. Descriptive statistics were used to analyze the data from the Qualtrics survey and demonstrate a change in behavior. Future researchers should expand on the number of participants and length of the intervention to determine the impact of a teacher developed program for the game of basketball.

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## CHAPTER ONE

### Introduction

Physical education and high school sports aim to motivate students to reach their highest levels of academic and sport performance (SHAPE America, 2021). Physical activity has been reported to positively impact self-efficacy, self-esteem, self-confidence, and self-concept in adolescence (McIntyre et al., 2015; Stein et al., 2007). Various forms of physical activity, including anaerobic, aerobic, and muscular strength exercise can positively influence self-perception and motivation; thus increasing engagement levels in physical activity for adolescence students (Daley, 2002; McIntyre et al., 2015). ADHD is a neurodevelopmental disorder that manifests itself in symptoms, such as inattention and hyperactivity-impulsivity (Litner, 2003; Suarez-Manzano et al., 2018; Welsch et al., 2021) and has an incidence rate of 5.3% in youth of 5 to 18 years with boys being diagnosed three time more often than girls (Suarez-Manzano et al., 2018). Children with ADHD often reach adolescence suffering from poor self-concept, self-esteem, and self-confidence (Litner, 2003; Welsch et al., 2021). Self-Determination Theory (SDT) emphasizes support of the basic psychological needs of autonomy, competence, and relatedness to enhance intrinsic motivation and healthy development (Ryan & Deci, 2020). Researchers have suggested exercise or successful fitness programs have positive benefits on participants' psychological health including self-esteem and self-concept (Lubans et al., 2010; McIntyre et al., 2015).

### Individuals with ADHD and Physical Activity

Attention deficit hyperactivity disorder (ADHD) is a neurodevelopmental disorder that may result in deficits in cognition and behavior (Litner, 2003; Suarez-Manzano et al., 2018; Welsch et al., 2021). Due to difficulties staying on task or inattentive behaviors, children with ADHD have additionally performed at lower levels academically when compared to their typically developing peers (DuPaul & Langberg, 2015). Physical activity has shown to have benefits on cognition and behavior of youth and adolescence with ADHD (Suarez-Manzano et al., 2018; Welsch et al., 2021). Additionally, individuals who participate in extra-curricular activities and exercise programs often display self-perceptions and sports competence (Daley, 2002).

### Self-perception

Ryan and Deci (2020) stated that autonomy aids in improvements of intrinsic motivation and self-perception. For students with ADHD these opportunities for autonomy can directly benefit this population as the child is directly involved in decision making processes (Litner, 2003). Understanding and improving self-perception has been increasingly valued across educational, clinical, and health-related communities and programs (Ferreira & Fox, 2008). Perception of physical competence is an important predictor of participation, effort, and long-term interest in sport (Daley, 2002; Stein et al., 2007). Anaerobic, aerobic, and muscular strength engagement in adolescence can positively influence their self-perception and motivation in physical activity (Daley, 2002; McIntyre et al., 2015). Therefore, students in the high school setting may benefit

from participation in physical activity outside of the educational setting (McIntyre et al., 2015).

### Self-Determination Theory

SDT has been used by researchers to increase physical activity and promote healthy lifestyles (Edmunds et al., 2008; Fortier et al., 2012; Gillison et al., 2006; Silva et al., 2010; Teixeira et al., 2012). SDT has supported weight management (Silva et al., 2010) while also demonstrating positive results on exercise behaviors and quality of life (Gillison et al., 2006), physical activity promotion (Fortier et al., 2012), as well as motivational factors (Ryan & Deci, 2020; Teixeira et al., 2012). When motivation is internalized, researchers have reported individuals to be more autonomous or self-determined to engage in a related behavior (Edmunds et al., 2008; Fortier et al., 2012; Gillison et al., 2006; Silva et al., 2010; Teixeira et al., 2012).. Deci and Ryan (2020) in their description of SDT indicate that factors of self-perception (e.g. confidence, self-esteem, and mental health) are deeply affected by school's support of basic psychological needs (e.g. autonomy, relatedness, competence). Further, McIntyre (2015) reported exercise programs focused on enjoyment, personal goals and achievements produced greater improvements in self-perception than those focused on extrinsic factor. Furthermore, researchers believe that improvements in self-perception of adolescence can be enhanced through successful fitness programs (Daley, 2002; Lubans et al., 2010; McIntyre et al., 2015) related fitness skills in high school athletes are to be achieved, a quality and feasible physical fitness program will most likely promote these changes.

### Requirements for Performance

Successful basketball will need to be able to perform a variety of movements (e.g., jumping, agility) throughout a game and a researchers have reported these skills can be improved over time (Asadi, 2013; Klinzing, 1991). Muscular power is when an individual uses maximum strength levels in short spurts of time. To improve maximum strength performance in jumping and agility skills basketball programs should include exercises that include repeated muscular power and explosive strength (e.g. weightlifting; Asadi, 2013; Klinzing, 1991; Otto et al., 2012) and plyometric movements.

### Muscular Strength and Plyometric Movements

Researchers have reported that plyometric training improves jumping ability, agility, strength and running economy (Adams et al., 1992; Asadi, 2013; Klinzing, 1991). Otto et al. (2012) reported that weightlifting movements and vertical jumping are specific to a variety of athletic skills with similarities between the two movements in their relation to strength and power. Using a combination of plyometric and weightlifting fitness programs has been proven to be beneficial to athletes' vertical jump during pre-season and in-season periods (Adams et al., 1992; Arabatzi et al., 2010; Klinzing, 1991). In a training program which combines plyometric and weightlifting demonstrated improved vertical jump height, and should be used in the transition phases from pre-season to the in-season period (Arabatzi et al., 2010).

### Statement of purpose

This study has two purposes: (a) to determine the effect of a teacher-developed physical fitness program on the performance of specific participant goals for the game of

basketball and (b) to determine the impact of this same program on the overall perception of the participants amongst their peers when participating in the game of basketball.

## CHAPTER TWO

### Method

#### Participants

The participants in this study were two males between 16 and 17 years of age. Both participants attended the same high school in Northern California and were enrolled in a high school fitness and conditioning physical education course. Participant 1 for this study had a previous diagnosis of ADHD and received accommodations which included: (a) access to exercise breaks, (b) access to a core support course, (c) use of quiet study area for assignment and tests, (d) preferential seating near a positive peer, (e) assistance with organizational skills, and (f) access to notes for tests. Participant 1 reported having difficulty focusing for longer periods of time. Participant 1 had previously participated in 5 years of organized basketball at both the middle school and high school grade levels.

Participant 2 is a typically developing peer who has participated in 10 years of organized basketball at the elementary, middle school, and high school grade levels. It should be noted that both participants played together during their 8-grade year, as well as the freshman and junior varsity basketball teams at their high school.

#### Recruitment of Participants

Each participants' parents and/or caregivers were provided the consent form prior to any data collection. The primary researcher also spoke with both participants about their interest in participating in the study. Prior to beginning this study both parents

and/or caregivers of the students confirmed that their child was healthy (no previous lower or upper body injury) and had no medical or orthopedic problems that would impact their ability to complete this study.

#### Instrument and setting

This study included multiple measurement instruments. Additionally, each participant completed a self-perception survey developed by the research team. This study took place within multiple settings which included the school gym and the school weight room. Both settings provided the opportunity for the participants to test and train with limited interruptions and was within their natural environment.

Vertical jump. The Vertec vertical jump tester was set up in the gymnasium and set at a height that where the top of the measuring instrument was double their standing reach height.

Standing long jump. A measuring tape was placed on an open and long concrete sidewalk on the campus measuring at 180 inches (15 feet). Masking tape was used to tape down the start of the measuring tape, where the top of the masking tape is perpendicular to the zero on the measuring tape. When participants landed, they could use their hands on the ground to stop their momentum but needed to have their feet remain where they landed.

15-meter shuttle run. A measuring tape was used to measure 5 meters on the hardwood inside the gymnasium. Cones were used to signify the start and end of the 5 meters, and 5 meters of masking tape was used perpendicular to the starting cone and ending cone.

Squat jump repetitions. A timer in a clock application on a smartphone device was set to one minute. Participants chose the location in the gymnasium to perform the squat jump test. When the participant showed initial movement into their first squat jump, the timer started.

1RM. Standard weightlifting equipment including a squat rack, barbells, weight bench and incline weight bench with safety rack, dumbbells, leg extension machine, and seated leg curl machine were used by participants in reaching their 1 repetition maximum (1RM) in back squat, incline bench press, knee extension, knee curl, forward arm raise, and lateral arm raise.

## Procedures

### Pre-Baseline Phase

Prior to the baseline phase, participants completed a 17-question survey that included background and self-perception questions using a link to the Qualtrics survey sent to their school email. 6 background survey questions focused on basketball and fitness participation prior to the start of the study, and 11 self-perception survey questions focused on how the participants perceived themselves participating in basketball and fitness.

### Baseline Phase

Within the baseline phase, each participant was tested on their standing vertical jump, standing long jump, 15 m shuttle run, and number of jump squats over the course of 1-minute. Additionally, participants completed a self-perception survey that focused on how they perceived their abilities to participate in the open gym basketball time at their school. Researchers collected participants' 1RM for back squat, incline bench press, knee extension, knee curl, forward arm raise, and lateral arm raise used to calculate percentages of weight used during the intervention. All baseline testing took place during the participants normally scheduled physical education class within the first week of this study.

### Dependent Measures

Vertical jump. Vertical jump was measured by each participant's ability to perform a vertical jump to their highest and best ability. Participants were instructed to

take one step toward the Vertec and jump up as high as they could using their dominant arm and hand to touch the target vanes. Each participant was given two practice attempts before their standing vertical jump was collected.

Standing long jump. Standing long jump was measured by the participant's ability to jump forward from a standing position as far as possible. Participants were given two practice trials, then their third and final trial was recorded in inches. Students were instructed to place both feet behind the masking tape, where their toes were right behind the tape, to swing their arms back, then jump as far as they could in the direction of the measuring tape.

15-meter shuttle run. Participants 15 m shuttle run was measured by each participant's ability to complete a 15 m shuttle run. Participants received two practice trials, and their third trial time was recorded in seconds. Participants were instructed to place their starting foot behind the starting masking tape, and on the word "go", sprint to the ending making tap, pivot, and sprint back to the starting masking tape, then pivot and sprint through the ending masking tape.

Squat jump repetitions. Jump squat repetitions was measured by the participants' ability to complete as many jump squats as they could in one minute. The researcher provided a visual demonstration and explanation of how to perform a jump squat, then participants were given 2 minutes to practice the jump squat technique and get feedback from the researcher. Participants were instructed to, on the word "go", perform as many jump squats as they can over the course of one minute, and when they hear the word "stop" they end the test.

1RM. Participants recorded their 1RM for back squat, incline bench press, knee extension, knee curl, forward arm raise, and lateral arm raise in the weight room on campus with the help of the primary researcher. Participants were to perform three reps of weight, and if they succeeded, they were to add more weight. Once the participant failed to perform three reps of a weight, their 1RM max was recorded.

### Intervention Phase

The intervention phase of this study replicated two previous studies (Asadi, 2013; Klinzing, 1991) where participants completed specific movements to improve functional power, ground force power, and repetition endurance. The exercises performed for weight training was based on similar studies (Klinzing, 1991) and exercises, intensity and volume of plyometric training was based on recommendations of (Asadi, 2013). Exercises worked to develop the primary muscle groups used in jumping: glutes, quadriceps, hamstrings, gastrocnemius, soleus, trapezius, deltoids, and back extensors (Klinzing, 1991). Refer to Table 1 for weightlifting schedule and exercises and Table 2 for plyometric training schedule and exercises.

Weightlifting. Weightlifting exercises were performed on Tuesday and Thursday. Prior to exercising, participants were to perform 2 minutes of dynamic warmups with their fitness and conditioning class. After the dynamic warmup, participants went to the weight room and perform 50% of their 1RM for each weightlifting exercise. On Tuesday, weightlifting exercises included incline bench press, knee extension, and forward arm raise as well as core exercises with a three-minute rest between sets. On Thursday, weightlifting exercises included back squat, knee curl, and lateral arm raise as well as

core exercises with a three-minute rest between sets. Each week participants were to perform certain percentages and reps of their 1RM for each exercise. Table 1 presents the weightlifting schedule for Tuesday and Table 2 presents the weightlifting schedule for Thursday.

**Table 1.***5-Week Weightlifting Training Schedule for Participants on Tuesday*

	Week 1	Week 2	Week 3	Week 4	Week 5
Tuesday	2 x 8-10	2 x 6-8	2 x 8-10	2x8-10	2 x 6-8
	65% 1RM	85% 1RM	75% 1RM	65% 1RM	85% 1RM

*Note.* 1RM = one repetition maximum. Exercises include incline bench press, forward arm raise, back extension, knee extension, core.

**Table 2.***5-Week Weightlifting Training Schedule for Participants on Thursday*

	Week 1	Week 2	Week 3	Week 4	Week 5
Thursday	2 x 8-10	2 x 6-8	2 x 8-10	2x8-10	2 x 6-8
	65% 1RM	85% 1RM	75% 1RM	65% 1RM	85% 1RM

*Note.* 1RM = one repetition maximum. Exercises include back squat, knee curl, lateral arm raise, toe raises, core.

Plyometrics. Plyometric exercises were performed Monday and Wednesday. Prior to exercising, participants were to jog for two minutes, then complete three minutes of ballistic exercises as their warmup. Participants will perform 3x15 of depth box jump, double leg bounding, and vertical jumps (forward, side, back) with a two-minute break between sets. The schedule for plyometric exercises is described in Table 3.

**Table 3.***Plyometric Training Schedule for Participants During 5-Week Intervention*

	Monday	Wednesday
Sets/Reps	3 x 15	3 x 15
Exercises	Depth box jump	Depth box jump
	Double leg bounding	Double leg bounding
	Forward vertical jump	Forward vertical jump
	Side vertical jump	Side vertical jump
	Backward vertical jump	Backward vertical jump

*Note.* Participants will be performing each exercise listed for 15 repetitions and a total of 3 sets.

**Table 4.***Warm-up Schedule for Weightlifting and Plyometric Training*

Training	Exercises	Duration
Weightlifting	Dynamic warm-up	2 min
	Weightlifting exercises	1 x 10 50% 1RM
Plyometric	Jogging	2 min
	Ballistic	3 min
	exercises/stretching	

*Note.* 1RM = one repetition maximum.

### Post-Intervention

Self-perception survey. After the intervention, participants took a 16-question survey based on self-perception after the intervention was complete. Questions focused on how the participants' perceived themselves when participating in basketball and fitness after the implementation of the intervention.

Within the Post-intervention phase, each participant was tested on their standing vertical jump (Vertec), standing long jump, 15 m shuttle run, and number of jump squats over the course of 1-minute. Additionally, qualitative data was collected via a 3-question survey completed by the primary physical education teacher at the end of the study.

### Social Validity

Social validity refers to independent variables (IVs) functional relevance to socially important outcomes and is enhanced by dependent variables with high social importance, IVs applied with fidelity by typical intervention agents (e.g. teachers, parents) in typical contexts across meaningful periods of time, and typical intervention agents report the procedures to be acceptable, feasible within available resources, effective, and choose to continue the use of the intervention procedures after formal support is removed (Horner et al., 2005). The participants' primary physical education teacher completed a 3-question survey based on the quality and validity of the intervention via a link to the Qualtrics survey through their teacher email. Questions focused on the appropriateness of the intervention, possible changes to the fitness program or intervention, and possible use of the same or similar program for future students with and without disabilities.

### Research Design

The relationships between fitness programs and self-esteem are well established (Lubans et al., 2010; McIntyre et al., 2015). Similarly, effective fitness program that include weightlifting and plyometric training components have been shown to increase jump ability in basketball athletes (Adams et al., 1992; Arabatzi et al., 2010; Klinzing, 1991). However, less is known about the effects of a teacher-developed physical fitness program on jump ability and self-perception of high school students. To investigate this, researchers conducted an experimental research study to determine the effects of a teacher-developed physical fitness program on basketball skills and self-perception of two high school athletes.

### Analysis

Descriptive statistics will be used to describe the data from a Qualtrics survey. In addition, descriptive statistics will be used to demonstrate a change in behavior across each major focus area (i.e., standing vertical jump, standing long jump, shuttle run, jump squat repetitions).

## Results

Basketball skill focus areas of standing vertical jump, standing long jump, 15m shuttle run, and squat jump repetitions were compared between baseline scores and post-intervention scores. Participant self-perception was reported qualitatively.

### Basketball skills

Participant 1 showed increases in standing vertical jump, standing long jump, 15m shuttle run, and squat jump repetitions over 1-minute. The standing vertical jump score increased by 1.5 inches from 35 inches (baseline) to 36.5 inches (post-intervention). The standing long jump distance increased by 3 inches from 98 inches (baseline) to 101 inches (post-intervention). The 15m shuttle run decreased in time by 0.39 seconds from 4.13 seconds (baseline) to 3.74 seconds (post-intervention), and squat jump repetitions over 1-minute increased by 12 from 44 (baseline) to 56 (post-intervention).

Participant 2 showed increases in standing vertical jump, standing long jump, 15m shuttle run, and squat jump repetitions over 1-minute. The standing vertical jump score increased by 4 inches from 29 inches (baseline) to 33 inches (post-intervention). The standing long jump distance increased by 11 inches from 91 inches (baseline) to 102 inches (post-intervention). The 15m shuttle run decreased in time by 0.06 seconds from 4.05 seconds (baseline) to 3.99 seconds (post-intervention), and squat jump repetitions over 1-minute increased by 8 from 40 (baseline) to 48 (post-intervention).

**Table 5**

*Descriptive statistics of change in behavior across major focus areas*

	SVJ	SVJ	SLJ	SLJ	15m	15m	SJR	SJR
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
P1	35in	36.5in	98in	101in	4.13sec	3.74sec	44	56
P2	29in	33in	91in	102in	4.05sec	3.99sec	40	48

*Note.* P1= Participant 1, P2= Participant 2, in= inches, sec= seconds. SVJ= vertical jump, SLJ= long jump, 15m= 15-meter shuttle run, SJR= Squat jump repetitions.

### Self-perception

When asked what each participant enjoyed most about playing basketball Participant 1 prior to the intervention reported that he enjoyed the aspect of “teamwork” as opposed to Participant 2 who reported “playing with the team.” After the intervention Participant 1 reported “playing with the team” as opposed to Participant 2 who reported being successful in individual skills within the game. When asked how many days per week participants played basketball with a friend Participant 1 prior to the intervention reported playing 1-2 days as opposed to Participant 2 who reported playing 3-4 days. After the intervention Participant 1 reported 4-5 days per week as opposed to Participant 2 who reported playing with a friend every day. When asked how many days per week participants played basketball on their own Participant 1 prior to the intervention reported playing 1-2 days as opposed to Participant 2 who reported 3-4 days. After the

intervention Participant 1 reported 1-2 days while Participant 2 reported 4-5 days. When asked how many days per week each participant lifted weights Participant 1 prior to the intervention reported 1-2 days as opposed to Participant 2 who reported 3-4 days. After the intervention Participant 1 reported 3-4 days as opposed to Participant 2 who reported 4-5 days. When asked what each participants lifts focused on both participants prior to the intervention reported lifts being a combination of upper body, lower body, and core. After the intervention Participant 1 reported lifts being lower body as opposed to Participant 2 who reported a combination of upper body, lower body, and core.

When asked what each participants best skills were in the game of basketball Participant 1 prior to the intervention reported his best skills being defending and teamwork as opposed to Participant 2 who reported shooting, dribbling, passing, and teamwork. After the intervention Participant 1 reported shooting, defending, and teamwork while Participant 2 reported shooting, dribbling, and passing. When asked what skills each participant wanted to improve Participant 1 prior to the intervention reported shooting, dribbling, and passing as opposed to Participant 2 who reported defending. After the intervention Participant 1 reported shooting while Participant 2 reported defending. When asked what level of success each participant had when playing basketball with peers Participant 1 prior to the intervention reported being pretty good as opposed to Participant 2 who reported being very successful. After the intervention both participants' answers remained the same. When asked what level of fitness each participant had compared to their peers while playing the game of basketball Participant 1 prior to the intervention reported being as good as other as opposed to Participant 2 who

reported being in their best shape. After the intervention both participants reported being in their best shape. When asked to rate how confident participants were in building an exercise plan appropriate for the areas they want to improve in, Participant 1 prior to the intervention reported “average” as opposed to Participant 2 who reported “not confident at all”. After the intervention Participant 1 reported “confident” while Participant 2 reported “average”. When asked to how confident participants were in their ability to perform the same movements as their peers, Participant 1 prior to the intervention reported “confident” as opposed to Participant 2 who reported “average”. After the intervention both participants’ answers remained the same. When asked how each participant viewed working out with weight in the gym to obtain their goals for basketball both participants prior to the intervention reported it being moderately important. After the intervention Participant 1 reported it being extremely important while Participant 2 reported it being very important. When asked how each participant viewed working out through playing basketball on their own to achieve their goals, Participant 1 prior to the intervention reported it being very important as opposed to Participant 2 who reported it being extremely important. After the intervention both participants’ answers remained the same. When asked how each participant viewed working out through playing basketball with their peers to achieve their goals, Participant 1 prior to the intervention reported it being moderately important as opposed to Participant 2 who reported it being extremely important. After the intervention Participant 1 reported it being extremely important while Participant 2 reported it being moderately important.

When asked what each participants' level of optimism was about starting an individualized exercise program based on their identified goals, Participant 1 prior to the intervention reported feeling excited as opposed to Participant 2 who reported feeling average. After the intervention, when asked how confident each participant was in their ability to build a program for themselves for the game of basketball having experienced an individualized exercise program, Participant 1 reported being very confident while Participant 2 reported being confident. When asked to rate each participants' ability to complete some workouts without an instructor present Participant 1 prior to the intervention reported "high" as opposed to Participant 2 who reported "very high". After the intervention Participant 1 reported "very high" while Participant 2 reported "high".

## Discussion

There were two purposes within this study: (a) to determine the effect of a teacher-developed physical fitness program on the performance of specific participant goals for the game of basketball, and (b) to determine the impact of this same program on the overall perception of the participants amongst their peers when participating in the game of basketball. The researcher hypothesized that improvements to basketball related fitness skills and self-perception of high school athletes can be achieved through a quality and feasible physical fitness program. The results of this study indicated that both participants improved in the basketball skill areas of standing vertical jump, standing long jump, 15m shuttle run, and squat jump repetitions. Participant 1 had a larger improvement in the areas of the 15m shuttle run and jump squat repetition while Participant 2 showed larger improvements in the standing vertical jump and standing long jump. Further, both participants demonstrated increases in self-perception related to their participation in fitness and the game of basketball, where Participant 1 reported a greater overall increase in self-perception when compared to Participant 2.

Study results align with previous studies (Adams et al., 1992; Arabatzi et al., 2010; Asadi, 2013; de Villarreal et al., 2009; Klinzing, 1991; Otto et al., 2012; Sáez de Villarreal et al., 2021), showing that weightlifting and plyometric fitness programs can significantly increase vertical jump ability. The intervention in this study replicated and combined two previous studies that independently focused on weightlifting (Klinzing, 1991) and plyometrics (Asadi, 2013) to improve power and agility performance in young

male basketball players. In a study designed to examine the effect of a six-week squat, plyometric, and squat-plyometric training on power production, researchers found that the combined squat-plyometric training increased power production, as measured by the vertical jump, significantly more than the separate squat or plyometrics training programs (Adams et al., 1992). These results align with the results of the current study as participants increased their vertical jump height after combined weightlifting-plyometric training. In one study aimed to determine whether change in physical activity levels impacts adolescents' self-perceptions, researchers found that increase in physical activity was positively associated with changes in social and athletic self-perceptions (Stein et al., 2007). In this study, researchers found that the fitness program aimed to help participants achieve their goal of increasing their vertical jump and basketball skills also had a positive impact on participants' self-perception when playing the game of basketball.

### Limitations

Limitations in the study include a portion of the intervention where participants were expected to complete a fitness program on their own without the oversight of the primary researcher. Additionally, Participant 1 missed a total of 4 sessions within the intervention phase. Moreover, participation in open gym basketball practices could have interfered with the results of this study due to the nature of the experimental design. Finally, results of this study should be looked at with caution due to a limited sample of two students (one typically developing, one with ADHD) as well as a shortened duration of the study due to school holidays and ending of semester. For these reasons future researchers looking to expand on this study should do so by increasing the number of

participants, length of duration of the study, and the control of participants behaviors outside the study.

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APPENDICES

**Appendix A: Student self-perception survey (baseline)****Survey****Background Information**

1. At what age did you begin playing basketball?
2. What do you enjoy most about playing basketball?
3. On average over the last 6 months how many days a week do you play basketball with a friend(s)?
  - a. 1-2 days   b. 3-4 days   c. 4-5 days   d. I play with friends every day
4. On average over the last 6 months how many days a week do you play basketball on your own?
  - a. 1-2 days   b. 3-4 days   c. 4-5 days   d. I play basketball every day on my own
5. On average of the last 6 months how often do you lift weights per week?
  - a. 1-2 days   b. 3-4 days   c. 4-5 days   d. I lift weights every day of the week
6. On average over the last 6 months what part of the body have you focused on when lifting?
  - Lower body
  - Core
  - Upper body
  - Combination of all

**Self-Perception**

7. Over the last 6 months when playing the game of basketball what do you think your best skill is? (You can select more than one).
  - Shooting
  - Dribbling
  - Passing
  - Defending
  - Teamwork

8. Over the last 6 months when playing the game of basketball what has been the area of basketball you have most wanted to improve? (You can select more than one).

- Shooting
- Dribbling
- Passing
- Defending
- Teamwork

9. Over the last 6 months when playing the game of basketball with your peers how successful have you been?

- Very successful
- Pretty good
- Average
- Not good
- Not Successful

10. Over the last 6 months when playing the game of basketball how would you compare your overall fitness levels to your peers?

- I'm in the best shape
- I'm in as good as shape as others
- Average
- Need to improve
- Biggest area of concern for me

11. When working out on your own in the gym, how confident are you in building an exercise plan that is appropriate for the areas you want to improve in?

- Very confident
- Confident
- Average
- A little confident
- Not confident at all

12. When working out in the gym with your peers, how confident are you in your ability to perform the same movements as your peers?
- Very confident
  - Confident
  - Average
  - A little confident
  - Not confident at all
13. When thinking about obtaining your goals for basketball, how important do you view working out with weights in the gym?
- Very important
  - Important
  - Average
  - Somewhat important
  - Not important at all
14. When thinking about obtaining your goals for basketball, how important do you view working out in the gym (basketball) on your own?
- Very important
  - Important
  - Average
  - Somewhat important
  - Not important at all
15. When thinking about obtaining your goals for basketball, how important do you view working out in the gym (basketball) with your peers?
- Very important
  - Important
  - Average
  - Somewhat important
  - Not important at all

16. How optimistic are you about starting an individual exercise program based on your identified goals?

- Very excited
- Excited
- Average
- Somewhat
- Not excited

17. How would you rate your ability to complete a program where you will be expected to complete some of the workouts without an instructor not present?

- Very high
- High
- Average
- Low
- Very low

**Appendix B: Student self-perception survey (post-intervention)****Post Survey**

1. After participating in this basketball program, what do you enjoy most about playing basketball?
2. Over the last 5 weeks how many days a week did you play basketball with a friend?
  - 1-2 days
  - 3-4 days
  - 4-5 days
  - I play every day with friends
3. Over the last 5 weeks how many days a week did you play basketball on your own?
  - 1-2 days
  - 3-4 days
  - 4-5 days
  - I play every day on my own
4. Over the last 5 weeks how often did you lift weights per week?
  - 1-2 days
  - 3-4 days
  - 4-5 days
  - I lift weights every day of the week
5. Over the last 5 weeks what part of the body have you focused on when lifting weights?
  - Lower body
  - Core
  - Upper Body
  - Combination of all

6. Over the last 5 weeks when playing the game of basketball what do you think your best skill is? (You can select more than one).
- Shooting
  - Dribbling
  - Passing
  - Defending
  - Teamwork
7. Over the last 5 weeks when playing the game of basketball what has been the area of basketball you have most wanted to improve?
- Shooting
  - Dribbling
  - Passing
  - Defending
  - Teamwork
8. Over the last 5 weeks when playing the game of basketball with you peers how successful have you been?
- Very successful
  - Pretty good
  - Average
  - Not good
  - Not successful
9. Over the last 5 weeks when playing the game of basketball how would you compare your overall fitness levels to your peers?
- I'm in the best shape
  - I'm in as good as shape as others
  - Average
  - Needs to improve
  - Biggest area of concern for me

10. When working out on the own in the gym, how confident are you in building an exercise plan that is appropriate for the areas you want to improve in?
- Very confident
  - Confident
  - Average
  - A little confident
  - Not confident at all
11. When working out in the gym with your peers, how confident are you in your ability to perform the same movements as your peers?
- Very confident
  - Confident
  - Average
  - A little confident
  - Not confident at all
12. When thinking about obtaining your goals for basketball, how important do you view working out with weights in the gym?
- Not important at all
  - Slightly important
  - Moderately important
  - Very important
  - Extremely important
13. When thinking about obtaining your goals for basketball, how important do you view working out in the gym (basketball) on your own?
- Not important at all
  - Slightly important
  - Moderately important
  - Very important
  - Extremely important

14. When thinking about obtaining your goals for basketball, how important do you view working out in the gym (basketball) with your peers?

- Not important at all
- Slightly important
- Moderately important
- Very important
- Extremely important

15. Now that you have experienced an individualized exercise program, how confident are you in your ability to build a program for yourself moving forward for the game of basketball?

- Very confident
- Confident
- Average
- A little confident
- Not confident at all

16. Now that you have completed this program, how would you rate your ability to complete some of the workouts without an instructor?

- Very high
- High
- Average
- Low
- Very Low

**Appendix C: Primary teacher survey****Social Validity Questionnaire**

1. Do you believe this training program/intervention was appropriate for the students?

Yes or No. Please explain your answer

2. Did you observe any behavior change in either or both of the participants during this training program/intervention? Yes or No. Please explain any changes you observed.

3. Would you consider running the same or similar program for your future students with or without disabilities? Yes or no. Please explain your answer.