

## **The Impact of Quality Physical Education on Healthy Living**

The public is generally aware that being healthy is important. However, the public may not know, or understand, the importance of physical education. Opinions regarding past physical education experiences in school often distort the link between quality physical education and personal health. Central to the association between physical education and health is the teacher. Teachers trained as physical educators exhibit higher levels of effective teacher behaviors (Constantinides et al., 2013) and create quality physical education programs. Trained physical education teachers can achieve, for example, greater physical fitness improvement in children than physical education teachers who lack appropriate training (Starc & Strel, 2012).

According to the latest Shape of the Nation Report (NASPE, 2012), both the *National Association of Sport and Physical Education* and the *American Heart Association* believe physical activity achieved through participation in physical education improves one's overall well-being and is one of the best preventers of significant health problems linked to many chronic diseases (e.g., obesity, high blood pressure, and high cholesterol). No other school subject has the potential to fulfill these health needs. If schools are to make a positive impact on our children's health now and in the future, physical education must be present in schools, be taught by qualified teachers, and focus on healthy behaviors.

### **Question 1 – Does PHYSICAL EDUCATION have a positive effect on children's physical health?**

According to research, the answer is yes. The following research studies serve as evidence that learning during physical education experiences can have positive, immediate, and long-term effects on children's health:

- Physical education plays an important role in promoting healthy behaviors. Students in physical education, when compared to those who are not in physical education, are more physically active, eat more fruit, and watch less television (Tassatano et al., 2010)
- When meeting national recommendations, participation in physical education diminishes the potential for future body mass increase among children (Fernandes & Sturm, 2011)
- When physical education increases, overweight or obese females decrease their Body Mass Index (Datar & Sturm, 2004)
- More physical education is associated with lower Body Mass Index scores (Madsen et al., 2009)
- Quality physical education with quality teaching represents an important predictor of health-enhancing cognitions and behaviors in elementary school children (Wilson et al., 2012)
- The odds of being an overweight adult decrease 5% for each day per week of physical education (Menschik et al., 2008)
- Males participating in physical education three or more days per week gained less in waist circumference than males who were in physical education less frequently (Wardle et al., 2007)
- Normal weight children are 25% more likely to be normal weight adults when they participate in physical education five days per week (Menschik et al., 2008)
- Physical education lowers Body Mass Index scores and reduces the probability of obesity among grade-five male students (Cawley et al., 2013)
- Even when physical education is offered at low frequencies, participation is associated with improved mental health and dietary choices (Simms et al., 2013)

- Quality physical education results in significant improvement in health-related fitness and psychological well-being in high school students (Sdrolias, 2009)
- Physical education programs that include frequent meetings, focus on prevention of obesity, and focus on management of obesity are effective in reducing the prevalence of childhood obesity (Gonzalez-Suarez et al., 2009)
- Secondary school students have less waist circumference gain when participating in more frequent physical education (Wardle et al., 2007)

**Question 2 – Does PHYSICAL EDUCATION promote lifelong physical activity and provide opportunities for frequent physical activity?**

According to research, the answer is yes. The following research studies serve as evidence that learning during physical education experiences can have positive, immediate, and long-term effects on children's physical activity levels.

- Quality physical education creates experiences which will enable students to transfer skills learned during physical education to their future. (McKenzie & Lounsbery, 2014)
- We have evidence from multiple large studies that the HOPE (Health Opportunities through Physical Education) can improve physical activity and academic outcomes. (Sallis et al., 2012)
- Student who enjoy physical education are more likely to have higher levels of cardiovascular fitness (Madsen et al., 2009)
- More active physical education class is related to higher levels of vigorous physical activity for females (Cawley et al., 2007)
- Middle schools students who are more active during physical education and receive greater enjoyment from physical education are significantly more likely to participate in leisure time physical activity (Cox et al., 2008)
- Quality physical education provides students with the knowledge, skills, abilities, behaviors, and confidence to be physically active throughout their lifetime. (Houston & Kulinna, 2014)
- Students that participate in physical education are much more likely to achieve the recommended daily levels of moderate to vigorous physical activity than those students who are not enrolled in physical education (Gordon-Larsen et al., 2000)
- High school students in physical education have greater potential for participating in physical activity (Tassitano et al., 2010)
- More frequent physical education class is strongly related to higher daily levels of moderate to vigorous physical activity (Gordon-Larsen et al., 2000)
- Girls who are enrolled in high school physical education report higher levels of moderate to vigorous physical activity than those who are not (Pate et al., 2007)
- On days when students have physical education, they are more active after school in various physical activities (Morgan et al., 2007)
- Students who receive more frequent physical education participate in more daily physical activity than those who attend physical education less frequently (Dale et al., 2000)
- Males in high school physical education that focuses on health are more likely to be physically active in the next five years than those who take traditional physical education (Dale et al., 1998)

- Females in high school physical education focusing on health are more likely to participate in strength training exercises and are less sedentary in the next five years than those who take traditional physical education (Dale et al., 1998)
- More physical education in high school is associated with greater adult physical activity levels (Peterson, 2013)
- Attitudes toward physical education are correlated with energy expenditure and moderate and vigorous physical activity (Woodfield, 2014)
- Teaching physical education, combined with health education, can increase physical activity in middle school adolescents (Clocksin et al., 2009)

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## The Impact of Physical Education on Motor Skills

The acquisition of motor skills is important for children. Proficient motor skills lead to feelings of competence and results in more competent performance during sport and recreational sport-like activities. In one example, Barnett et al. (2011) found that children who develop proficient object control skills (e.g., throwing, catching, and kicking) were more likely to become physically active later in life. Overall, there is ample evidence to support the link between motor skill development during childhood and long-term physical activity (e.g., Lopes et al., 2010; Okely et al., 2001; Wrotniak et al., 2006). Likewise, there is sufficient evidence to support the connection between low motor proficiency and lower physical activity (Williams et al., 2008; Wrotniak et al., 2006).

The importance of motor skills is recognized by SHAPE America (2014), who require physical education teachers to develop students who “demonstrate competency in a variety of motor skills and movement patterns.” The importance of effective teachers is not only exposed within national standards but in research as well. For example, McKenzie and Lounsbery (2014) recently reported that the potential of a physical education program to effectively teach students’ skills is closely tied to the quality of the physical education teacher (e.g., the skills and behavior they display). They also propose, from their data analyses, that effective physical education programs must include assessments and the use of data to support subsequent curricula.

### Question 1 – Does PHYSICAL EDUCATION improve children’s motor skills?

According to research, the answer is yes. The following research studies substantially support the relationship between participation in physical education and motor skill development:

- A study of over 700 elementary students revealed *physical education* programs delivered by properly trained specialists can improve throwing, kicking, and catching skills (McKenzie et al., 1998)
- Quality *physical education* lessons lead to significant improvements in elementary students’ fundamental motor skill mastery (van Beurden et al., 2003)
- *Physical education* lessons, using appropriate instructional models, can significantly improve object control skills in early elementary-aged students (Amui, 2006).
- *Physical education* programs that utilize developmentally appropriate motor skill learning experiences delivered by qualified physical education specialists significantly improve motor skills in youth (Morgan et al., 2013)
- *Physical education* teachers using appropriate teaching strategies positively influence more advanced throwing skill in elementary students (Lorson, 2003)
- Motor skill intervention is necessary and valuable for economically disadvantaged students in *physical education* programs (Robinson, 2007)
- Skill interventions like those in *physical education* have a lasting effect on object control skills, which are important as they influence health-related activity (Barnett, 2009)
- A well-planned *physical education* curriculum, in comparison to poorly planned programs, can be beneficial for motor skill proficiency (Andruschko, 2013)
- Well-designed instructional methods in *physical education* which focus on learning skills have a significant effect on fundamental movements of children (Fotrousi et al., 2012)
- A sport unit in *physical education* can reduce body mass index, percent body fat, and motor skill proficiency in early adolescents (Elsaved, 2014)
- School *physical education* stimulates the proper development of motor skills when children attend *physical education* more than two times per week (Ericsson, 2011)

- While differences in motor skills exist between boys and girls, frequent **physical education** involving organized lessons and high physical activity decrease the differences (Ericsson, 2011)
- Daily **physical education** with motor skill training has the potential, in comparison to less frequent physical education, to eliminate motor skill deficits (Ericsson & Karlsson, 2012)
- Children who receive **physical education** from a physical education teacher have significantly greater motor development than those who receive physical education from a classroom teacher (Starc & Strel, 2010)

## Resources

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## **The Impact of Physical Education on Brain Function and Academic Achievement**

Proponents of physical education often declare that participation in their subject area has a positive impact on academic achievement. If these assertions are to be believed, we must specifically look at the impact of a standards-based physical education curriculum. A standards-based physical education curriculum follows an appropriate set of objectives and goals based on national recommendations. All five national standards capture goals grounded in physical activity and movement (SHAPE America, 2014). Therefore, since physical activity is a primary focus in physical education curricula, the relationship between physical education and academic achievement may be observed through the potential academic benefits of physical activity.

Research literature consistently reports that children who participate in quality physical education are physically active outside of the school setting. We know that the activities in which students are taught during physical education (e.g., sports, games, exercise) are directly related to activities and sports students participate in outside of school (Eddy, 2011). Andruschko (2013) found well-planned physical education curricula, in comparison to poorly planned programs, to have potentially large benefits on children's physical activity outside of the school. Another study reported that physical education increases daily physical activity and decreases sedentary time in middle school age children (Chen et al., 2014). In the long term, Trudeau et al. (1999) found daily primary school physical education to have a strong positive effect on the exercise habits of adults.

To note, brain function includes cognitive skills while academic achievement includes learning behaviors (e.g., on-task behavior, planning, and organization) and performance on subject-area standardized tests and other formal assessments. In a recent unpublished report, Darla Castelli described how brain scans reveal cognitive function improvement in active children who returned to resting intensities prior to undertaking cognitive tasks (Schneider, 2014). She also found vigorous and intense physical education is related to optimal gain in cognitive performance, improvement, and speed. For a review of how physical activity affects the brain, refer to:

Centers for Disease Control and Prevention. (2010, July). The Association between school-based physical activity, including physical education, and academic performance. Retrieved from [http://www.cdc.gov/healthyyouth/health\\_and\\_academics/pdf/pa-pe\\_paper.pdf](http://www.cdc.gov/healthyyouth/health_and_academics/pdf/pa-pe_paper.pdf)

### **Question 1 – Does PHYSICAL ACTIVITY have a positive effect on children's brain function and/or academic achievement?**

According to research, the answer is yes. The following recent research studies support the belief that children's physical activity level is related to greater brain function and higher academic achievement:

- **Physical activity** is related to measures of executive function (Hillman et al., 2008; Sibley & Etnier, 2003; Tomporowski et al., 2011)
- **Physical activity** during childhood can positively influence brain function (specifically the volume of hippocampus and basal ganglia), the integrity of white matter tracts, and brain activation in the prefrontal cortex (Chaddock, 2013)
- **Physical activity** results in greater memory recall and develops greater memory storage processes (Pesce et al., 2009)
- Aerobic **physical activity** improves cognitive function through reaction and choice response time (Ellemborg & St-Louis-Deschenes, 2009)

- There is a significant positive relationship between children's *physical activity* and cognitive functioning (Sibley & Etnier, 2003)
- *Physical activity* increases time on task in class (Fisher et al., 2011; Mahar et al., 2006)
- *Physical activity* reduces classroom problem behaviors (Fisher et al., 2011; Mahar et al., 2006)
- Greater *physical activity* at age 8 was positively associated with higher grade point average at age 16 (Kantomaa et al., 2012)
- In a study of nearly 5000 students, higher *physical activity* at age 11 was associated with higher academic attainment across all academic subjects at age 11, age 13, and then age 16 (Booth et al., 2013)
- *Physical activity* of children age 7 to age 11 results in improved executive function and brain activation (Davis et al., 2011)
- Vigorous *physical activity* was associated with higher grades in grade 6 students (Coe et al., 2006)
- *Physical activity* has beneficial effects on attentional processes (Syvaaja et al., 2014)
- *Physical activity* influences concentration, memory, and classroom behavior (Trudeau & Shepherd, 2008)
- *Physical activity*, primarily *aerobic exercise*, has a significant and positive effect on children's academic achievement and cognitive outcomes (Fedewa & Ahn, 2011)
- Adolescent *physical activity* at a leisure level is associated with greater cognitive performance (Ruiz et al., 2010)

### **Question 2 – Does PHYSICAL EDUCATION have a positive effect on children's brain function and/or academic achievement?**

According to research, the answer is yes. In a recent review of literature, the CDC discovered 14 studies that examined the effect of physical education on academic achievement (CDC, 2010). Nearly all of these studies revealed one or more positive associations between physical education and academic achievement. The following research studies from recent years support the belief that participation in standards-based school physical education programs is related to greater brain function and higher academic achievement:

- Cognitively challenging physical activity programs such as *physical education* promote attention development in elementary-age children (Pesce et al., 2013)
- *Physical education* with higher physical activity intensity significantly improves adolescents' non-verbal and verbal ability, abstract reasoning, spatial ability, and numerical ability (Arday et al., 2013)
- Frequent *physical education* with high intensity physical activity significantly improves adolescents' academic achievement in relation to less frequent *physical education* with lower intensity physical activity (Arday et al. 2013)
- When students meet appropriate physical activity levels in *physical education*, data shows that more physical education and less classroom time does not hinder academic achievement (Trudeau & Shepherd, 2008)
- High school students have higher grade point averages during semesters taking *physical education* when compared to those semesters without *physical education* (Hamilton, 2014)
- Academic performance improves when less time is spent in the classroom and more time is spent in *physical education* (Sallis & McKenzie, 1999, Shepard, 1997)

- Daily *physical education* can increase various cognitive abilities, such as fluid intelligence and perceptual speed, of children in grade 2 through grade 8 (Reed et al., 2013)
- In a study of over 5000 kindergarten students, girls had significantly higher academic achievement in both math and reading when enrolled in more frequent *physical education*. Overall, there were no negative effects on academic achievement for students who participate in *physical education* (Carlson et al., 2008)
- Organized school *physical education* focusing on physical activity levels can improve children's inhibitory control (Chaddock-Heyman et al., 2013)
- Physical activity in school-based interventions like *physical education* can increase children's working memory performance (Fisher et al., 2011; Kamijo et al., 2011)
- Children's abilities to plan can be improved through *physical education* and associated physical activity (Davis et al., 2011)
- Quality *physical education* leads to gains in grade point average (Trudeau & Shepherd, 2008)
- *Physical education* focusing on health does not interfere with academic achievement and has potential favorable effects on standardized test scores (Sallis et al., 1999)
- Even when *physical education* is offered at low frequencies, participation is associated with improved academic achievement (Simms et al., 2013)

### **Question 3 – Do high FITNESS LEVELS have a positive effect on children's brain function and/or academic achievement?**

According to research, the answer is yes. The following research studies from recent years support the belief that participation in standards-based school physical education programs is related to greater brain function and higher academic achievement:

- High *aerobic capacity* (measured by FITNESSGRAM) is associated with higher academic achievement (measured by standardized test scores) in children. This relationship is maintained over time if children stay in the healthy fitness zone (Wittberg, et al., 2012)
- High *fitness* levels of children at age 10 is associated with attention, working memory, and memory response speed (Hillman et al., 2005)
- Children who are more aerobically *fit*, compared to less *fit* peers, have more fibrous and compact white-matter tracts in the brain (Yates, 2014)
- *Fitness* is associated with academic attainment (Castelli et al., 2007; Chaddock et al., 2001)
- *Aerobic capacity* and *muscular endurance* (measured by FITNESSGRAM tests) positively affect middle schools students' standardized test scores for reading and math (Bass et al., 2013)
- A consistent positive relationship was found between overall *fitness* through FITNESSGRAM scores and standardized norm-referenced achievement tests (Grissom, 2005)
- Children's *aerobic fitness* predicts cognitive performance over time (Chaddock et al., 2012a)
- Children who have greater *aerobic fitness* levels have better inhibitory control (Chaddock et al., 2012b; Pontifex et al., 2011)
- High *fitness* rates of children increase the chances of schools achieving high performing status (Welk, 2013)
- Higher *aerobic fitness*, when compared to lower aerobic fitness levels, can lead to better working memory (Chaddock et al., 2010)

- Children's odds of passing standardized tests, such as math and reading, increases with greater performance on *fitness* tests (Chomitz et al., 2008)
- The relationship between *fitness* and academic achievement is strengthened through the positive effect of fitness on executive functioning (van der Niet et al., 2014)

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## **The Benefits of Physical Education on Learning in the Affective Domain**

It has been long established in education that there are three key learning domains that make up the foundation of teaching and learning: psychomotor, cognitive, and affective (Bloom, 1974). The affective learning domain encompasses the social, emotional and psychological components of life, including getting along with others, respecting physical and cultural differences, developing an appreciation for fitness and physical activity for longevity and overall health and wellness, working with partners and within groups successfully, respecting authority, embracing fair play and sportsmanship, and increasing self-esteem, to name just a few examples.

Two of the five national standards for physical education require physical educators to teach students “responsible personal and social behavior that respects self and others” and the “value of physical activity for health, enjoyment, challenge, self-expression and/or social interaction” (SHAPE America, 2014). Physical education curriculum includes teaching and learning opportunities that address social, moral and emotional areas of growth and development. Students in physical education classes experience the benefits of teaching, skill development, cognitive learning, sport play, and moderate-to-vigorous physical activity on their social and emotional well-being.

### **Question 1 – Do physical education classes provide students opportunities to develop interpersonal relationships and improve social skills?**

Studies have shown that K-12 students develop positive social skills while participating in physical activity within a physical education class setting. Social and moral behavior learned in the quality physical education setting transfers to life skills in other settings and interactions.

- When students feel supported in their learning they often exhibit leadership qualities; they become decision-makers (Azzarito & Ennis, 2003)
- Within a physical education setting, students engage in activity with others who possess varying skill levels and abilities and are charged with the task of including all peers in a given sport/fitness activity (Perlman, 2014)
- Students develop an appreciation for the importance of lifelong physical activity and recreation (Graham et al., 2012; Hansen, 2011)
- Physical education content includes the affective domain with group/partner work, peer collaboration, self-assessment and reflection skills, sportsmanship and fair play (Payne & Isaacs, 2008)
- Physical educators encourage individual growth and social awareness among the diverse community of learners (Azzarito & Ennis, 2003)
- Quality physical education supports positive social behaviors such as cooperation, personal responsibility, and empathy (Bailey et al., 2009)
- It is the inherent process and nature of the physical education setting (regardless of the task) that affords students opportunities for personal, social and moral skill development that transfer to other areas of life (Sandford et al., 2006)
- Cooperative physical education learning environments foster development of social skills (Ruiz et al., 2010)

- A quality sport education model for secondary physical education can provide support for students' needs of relatedness among peers (Perlman, 2014; Wallhead et al., 2012)
- Models created for physical education, such as Sport Education, create a sense of connection with peers, and lend itself to a caring and empathetic environment among peers and between the teacher and students. All levels of physical ability are accepted, and students are able to work on communication and problem-solving skills (Perlman, 2014; Wallhead et al., 2012)
- Quality secondary physical education settings where cooperation and peer interaction are incorporated into lesson activities offer opportunities for development of social skills and give students practice at adapting to social norms in a physical activity setting; students develop a sense of care toward others (Ruiz et al., 2010)
- There is sufficient evidence to support claims of positive benefits between physical education and youth. Benefits are mediated opportunities to learn leadership, decision-making skills, social relationships, and learning processes (Bailey et al., 2009)
- Secondary students display autonomy in a quality sport education model of physical education. Students become responsible for their own learning and skill development, choosing ways in which to practice and selecting specific skills to focus on within a sport activity (Perlman, 2014)
- Self-determination theory suggests that the affective domain (psychological need) is critical for growth, development and well-being in students; in physical education, students have the opportunity to experience autonomy, competence, and relatedness, components of learning that lead to increases in self-efficacy and successful self-management (Shen et al., 2009).
- Quality physical education that includes the sport education curriculum content and model not only leads to increased social interaction and skills, but the social connections and interactions can lead students to choose extra-curricular exercise activities outside of school (Wallhead et al., 2012)
- Quality physical education courses that are designed to include student choice for physical activity can result in students who enjoy physical activity and are better prepared to manage their own fitness efforts (Condon & Collier, 2002)
- The promotion of a quality, comprehensive physical education experience can expose students to the benefits and importance of lifelong physical activity for social interaction, challenge, motor and skill development, fun and enjoyment throughout life; students can become self-directed in their fitness efforts (Kretchmar, 2006)
- There is a potential for reduction in sedentary activities in young people after high school graduation (Dale & Corbin, 2000; Le Masurier & Corbin, 2006)

**Question 2 – Do quality physical education classes inspire K-12 students and provide them with meaningful experiences?**

When the course is structured in a way that allows students to have some choice in the activities that interest them, the physical education experience is more meaningful and relevant.

- Students learn through peer interactions and authentic experiences in the classroom with the curriculum. Data show that students construct knowledge and make meaning of content

relevant to them by making connections to peers and connecting the physical activity content to their own lives, their communities and the real world (Azzarito & Ennis, 2003)

- A quality physical education class leads to positive student attitudes about physical activity and that can lead to subsequent, long-term physical activity and overall healthy habits as adults (Shen et al., 2009)
- A secondary physical education class that includes rich, relevant curriculum content, positive teacher behavior toward the content and the students, a pleasant class atmosphere and safe, sufficient facilities leads to increases in positive student attitudes about physical education and physical activity (Bibik et al, 2007)
- Quality physical education classes that are developed to present content in attractive, enjoyable ways lead young people to experience intrinsic motivation to continue in those physical activities, to experience an improvement in self-esteem and an increase in their level of autonomy with their physical efforts (Bailey et al., 2009; Perlman, 2014).
- Athletic participation is found to enhance girls' self-esteem, body concept, and self-efficacy (Sabo et al., 2004)
- Physical educators who focus on the joy of movement and provide play-oriented tasks in the elementary setting have more chance to produce young people who participate in moderate-to-vigorous physical activity long-term and can potentially help prevent childhood obesity (Kretchmar, 2008)
- Lifelong participation in physical activity (responsible, healthy lifestyles in adults) depends largely on positive, effective physical education class experiences (Bibik et al, 2007)
- Physical activity promotion programs, such as physical education, should address specific intrapersonal, social-environmental, and physical-environmental barriers to physical activity (Dwyer et al., 2006)

### **Question 3 – Does a quality physical education class teach students to value physical activity for sport and health reasons?**

Quality physical educators teach children about the importance of including fitness, exercise and sport activities throughout their lives.

- Quality physical education courses promote physical activity for lifetime wellness, with strong health-related fitness components (Le Masurier & Corbin, 2006)
- Students in elementary physical education classes enjoy relevant active-gaming activities whenever possible; teachers can incorporate technology-related physical activities that are engaging to students in the 21st century; students exhibited optimal engagement in active-gaming tasks according to the flow theory of play (Hansen, 2009)
- Successful online physical education courses offer students the opportunity to select physical exercise that is comfortable and interesting for them, therefore creating a successful experience and experiences that are relevant to their own lives, thus potentially leading to more and long-term fitness activity in our youth (Ransdell et al., 2008)
- Quality physical education teachers incorporate technology that engages students to a greater degree in the content and helps to create physically literate young adults. Some physical

education classes include a predominant online, technology-related component (blended learning) to enhance the health-related fitness components of the course (Rhea, 2011)

- Quality secondary physical education has been shown to provide students with the background knowledge needed to make informed decisions about selecting physical activity that interests them and that is beneficial for longevity (Condon & Collier, 2002; Ransdell et al., 2008)
- Quality physical education that includes 21st century skills and technology is ideal for getting students interested in being active, and students today learn and understand the benefits of physical activity (Hansen, 2009)

#### **Question 4 – Can quality physical education participation increase students’ self-esteem and feelings of well-being?**

K-12 physical education classes are the ideal settings for promoting positive self-esteem and overall feelings of well-being, through physical activity and motor/skill development and positive feedback and support from teachers and peers (Payne & Isaacs, 2011). Sport participation and physical activity, goals established by physical education curricula, play a significant role in children’s current and future psychological well-being.

- Positive self-esteem begins with a sense of well-being. Students in high school that attended physical education three to five days per week were less likely to report feelings of sadness (Brosnahan et al., 2004)
- Well planned physical education is associated with increases in general self-concept (Schmidt et al. 2013)
- High school students who attended physical education and participated in physical activity 5-6 times per week were less inclined to have suicidal thoughts (Brosnahan et al., 2004)
- Quality physical educators can support students by providing proper education about body image and defeating culturally defined, unrealistic expectations about body types. Teachers can encourage increases in self-esteem, self-efficacy and motivation through discussions and lessons that address these critical issues for adolescents; a supportive, safe physical education setting is appropriate for this type of education (Lodewyk et al., 2009)
- After a six month term of physical education with an experimental group of grade five students, where the focus was on individual goals, non-competitive physical activities and games, and students receiving positive praise often, the enhancement of self-concept and increase in self-esteem was significant compared to the group of students participating in the regular physical education program, as reported by the students on a self-assessment survey (Goni & Zulaika, 2000)
- Participation in formal and informal sport activity has been related to enhanced emotional well-being (Donaldson & Ronan, 2006)
- Participating in sport, one outcome of physical education, has the potential to improve self-esteem, social interaction, lessen the potential for depression (Eime et al., 2013)

- Children who spend more time in team sports report higher self-concept and self-esteem than non-participating peers (Slutzky & Simpkins, 2009)
- Physical inactivity was found to be associated with emotional and behavioral problems in adolescents (Kanomaa et al., 2008)
- Motor coordination affects emotional functioning via self-perceptions (Rigoli et al., 2012)
- Quality physical education fosters healthy peer interaction and peer collaboration. Healthy social identity in secondary school can lead to an increase in college enrollment in students graduating high school (Fletcher, 2011)
- Reduced participation in physical activity has been associated with reduced emotional self-efficacy in high school students (Valois et al., 2008)

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