THE IMPACT OF POSITIVE YOUTH DEVELOPMENT-PHYSICAL ACTIVITY BASED INTERVENTIONS ON BULLYING AMONG ADOLESCENTS: A SYSTEMATIC REVIEW

by

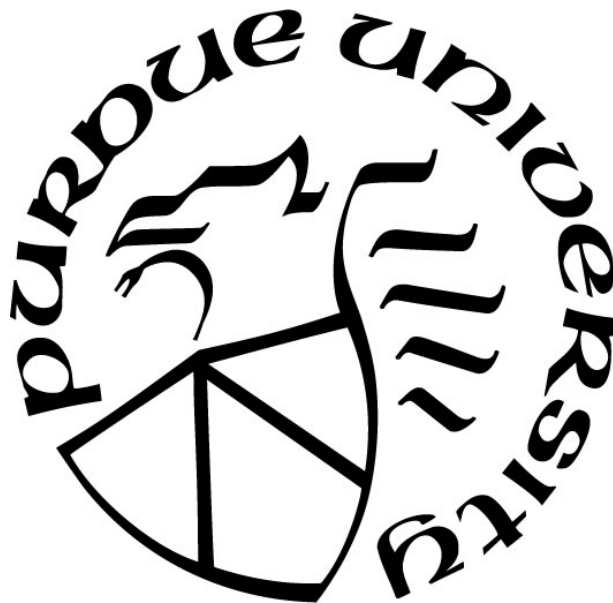**El Zahraa Majed**

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STATEMENT OF COMMITTEE APPROVAL

Dr. Yumary Ruiz, Chair
>   Department of Health and Kinesiology

Dr. Steve Amireault
>   Department of Health and Kinesiology

Jason Reed, MLS
>   Purdue University Libraries

Approved by:
>   Dr. David B. Klenosky
>>   Head of the Graduate Program

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ABSTRACT

Author: Majed, El Zahraa Majed MPH
Institution: Purdue University
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Committee Chair: Yumary Ruiz

Background. Despite on-going efforts to reduce bullying among adolescents, this phenomena remains a persistent public health problem (Espelage & Colbert, 2015). Positive youth development (PYD)-physical activity based programs have the potential to target health risk behaviors by focusing on positive psychological assets and promoting personal growth (Fraser-Thomas, Côté, & Deakin, 2005). Similarly, physical activity has been associated with physical and psychosocial benefits as it enhances the process of development, promote life skills, and foster personal and interpersonal skills through peers and non-parental adult interactions (Fraser-Thomas et al., 2005; Weiss, Smith, & Stuntz, 2008). While we know quite a bit about PYD programs and understand the importance of physical activity related to its influence on bullying behaviors, we know far less about the effectiveness of anti-bullying programs that combine both PYD with physical activity components. However, addressing this gap in the literature could inform prevention science research efforts as it would enhance understanding on how such interventions might decrease bullying in youth. This study aimed to evaluate the effectiveness of positive youth development (PYD) physical activity based interventions on bullying behaviors among pre- and young adolescents (8 - 14 years old). *Methods*. A systematic review was conducted and included a search of five databases (PsycINFO, PubMed, Cochrane Library, ERIC and CINAHL), and reference lists of included studies and reviews from 2003 to 2017. Additional information was requested from study authors. The study inclusion criteria included interventions that used both PYD and physical activity components, recruited participants who ranged in age from 8 to 14, and that targeted bullying behaviors (bullying, victimization, and bystander). Two independent reviewers assessed studies, and extracted data, and one reviewer evaluated risk of bias using the Cochrane risk of bias tool (Higgins, Sterne, Savović, Page, & Hróbjartsson, 2016). Studies were placed into two groups based on type of study (quasi-experimental and experimental). To

determine effect sizes for the quasi-experimental designs and experimental designs, Pearson's correlation coefficient (r) and standardized mean differences (SMD) were used, respectively. *Results*. Seven studies met the inclusion criteria, of which three were quasi-experimental and four were experimental studies. For bullying outcome, the quasi-experimental studies were found to have a small effect size ($r = -.24$ to $-.22$) while experimental designs had small, medium, and large effect size (*SMD* $= -.68$ to $.27$). For victimization, a medium effect size was found in one study (*SMD* $= -.53$), and for bystander involvement, a medium effect size was found for unadjusted model ($r = .37$), and a small/negligent effect size was found for the adjusted model ($r = -.05$). Reductions in bullying and victimization, and increase in prosocial bystander behavior were found across the physical activity-based, PYD interventions, which utilized a combined approach of PYD components (e.g., caring, empathy, respect), and physical activity context, as well as the use of an interactive and supportive approach to deliver the program's PYD component between the participants and staff. Selection bias, lack of blinding bias, attrition to follow-up bias, and failure to control for confounding were found across the studies, with experimental study designs reporting generally better quality than quasi-experimental. *Conclusion*. PYD-based, anti-bullying interventions with a physical activity component are promising in reducing bullying among adolescents. Findings revealed that the further interventions should be structured into a physical activity-based PYD setting that foster youth's psychosocial development and provide them with opportunities to develop these PYD components in a mastery-oriented climate, which in turn may reduce problem behaviors The small number of studies identified strongly suggests that there remains a critical need for PYD-physical activity based interventions that target bullying behaviors.

INTRODUCTION

Overview

Bullying is a subtype aggression that can be viewed as a conduct-disordered behavioral pattern, and generally an antisocial behavior (Olweus, 1994). Bullying, a behavior characterized by an intention to repetitively do harm and which is perceived as a power imbalance (Gladden, 2014), involves those who bully others (bullies), those who are bullied (victims), and those who observe, reinforce, assist, or defend the bully (bystanders; Olweus & Limber, 2010). Types of bullying include physical (e.g., hitting, pushing, or kicking), verbal (e.g., name calling, threatening, or taunting) and relational (e.g., socially isolating or spreading false rumors about the targeted individual) and individuals may experience bullying either directly or indirect (Gladden, 2014). Despite efforts to reduce bullying behaviors, it is still a public health issue that greatly effects adolescents (Espelage & Colbert, 2015). In fact, national data reveals that 28% of students in 6th to 12th grades experience bullying (Lessne & Harmalkar, 2013), and 76% of middle school students report witnessing bullying in their schools (Bradshaw, Sawyer, & O'Brennan, 2007). During the 2012-2013 school year more elementary students (28%) reported being bullied than middle (25%) and high school (19.2%) students (Rivara & LeMenestrel, 2016). Among high school students, a national survey in 2015 revealed that (15%) reported being cyberbullied. A more recent national survey has also found that (19%) of high school students reported being bullied on school property, and (24%) reported being in a physical fight in during the 12 months before the survey, with prevalence of being bullied and fighting being highest among 9th grader (28%) compared to 10th grader (26%), 11th grader (20%), and 12th grader (18%) grades (Kann et al., 2015; Kann et al., 2018).

Consequences Linked to Bullying

Current research has linked bullying behaviors with adverse health and behavioral consequences among bullies, victims, and bystanders. For instance, perpetrators of bullying have been found to experience elevated risk for low academic achievement, poor school adjustment (Nansel et al., 2001), problems with alcohol and smoking (Moore et al., 2014; Nansel et al., 2001), and subsequent violent and criminal behaviors later in their life (Rigby, 2003). For instance, in a

study conducted by Olweus (1993) in Sweden with 6th to 9th grade school children, the researcher examined social or legal outcomes among children who frequently engage in school bullying. Crime records were assessed and findings revealed that youth with a history of bullying were 4 times more likely to be involved in criminality (Olweus, 1993). Similarly, Losel, Ttofi, and Theodorakis (2012) found that bullying and victimization are linked to offending behavior and depression later in life. Specifically, they conducted a systematic review of longitudinal studies that examined the effect of school bullying and victimization on offending and depression later in life. Through their review the authors found that bullying perpetration at school significantly predicted offending six years later in life, with an unadjusted odds ratio effect size (OR) for 18 studies of $OR = 2.64$ and an adjusted effect size across 15 studies (after controlling for childhood risk factors) of $OR = 1.89$. Further, findings revealed that victims are at a greater risk of becoming depressed later in life with effect sizes across 30 unadjusted studies and 19 adjusted studies for childhood risk factors of $OR = 2.05$ and $OR = 1.71$, respectively. Moreover, in a prospective longitudinal study using birth cohort data, Moore and colleagues (2014) found that peer aggression is associated with mental health and substance use outcomes among youth. Conducted in Australia, this study recruited 1590 participants and collected data when participants were five, 10, 14, and 17 years of age. Here again, the researchers found that even after controlling for mental health problems and co-existing substance use as well as having mental health problems at age five, being a perpetrator of peer aggression at 14 years was associated with an increased risk of harmful alcohol use at 17 years with an $OR = 1.76$ ($95\%\ CI = 1.23 - 2.53$).

Bullying victims have also been found to experience adverse physical and psychosomatic problems such as stomach aches and sleeping problems (Rigby, 2003). For instance, Wolke, Woods, Bloomfield, and Karstadt (2001) conducted a study in England among 31 primary school children aged six to nine years of age ($N = 1639$) to examine the association of direct and relational bullying with common physical (e.g., coughs and colds) and psychosomatic (e.g., night walking) health problems. Parental reports of children's physical and psychosomatic health in the last six months, revealed that victimized children report more physical symptoms compared to non-victimized children, whereas bullies report less physical or psychosomatic health problems compared to victims. Moreover, 38% of victims made up illnesses, 17% worried about school, and 11% of victims were four times more likely to complain of having a sore throat (Wolke, Woods, Bloomfield, & Karstadt, 2001).

Lastly, being a bystander has also been linked to experiencing psychological and behavioral problems (Polanin, Espelage, & Pigott, 2012). For example, Rivers, Poteat, Noret, and Ashurst (2009) found that among youth an association existed between being a bystander and experiencing mental health problems. Specifically, the researchers examined the relationship between the impact of bullying and students' mental health among a sample of 2,002 students aged 12-16 years in 14 schools in England. Using measures of bullying at school, mental health risk, and substance abuse, the authors concluded that bystanders had at an elevated risk of experiencing anxiety, interpersonal sensitivity, and fear of being victimized compared to bullies. Furthermore, bystanders (30.4%) and youth who bullied others (1.4%) were at a higher level of predicted substance use, thus showing that commonalities exist between bullies and bystanders (Rivers et al., 2009).

Addressing Bullying

Risk-focused Interventions.

To fight the growing problem of bullying among youth, many interventionists have focused on reducing the risk factors that contribute to this behavior (Smith, Schneider, Smith, & Ananiadou, 2004). In the 1980s, Olweus (1993) developed the Olweus Bullying Prevention Program (OBPP), a whole-school approach program which assumes that bullying is a systematic problem that requires strategies be directed toward the entire school rather than simply at individual bullies and victims. This program aimed to reduce and prevent bullying incidents in schools through improving peer interactions peer-to-peer relations and restructuring the social environment into a safer more positive place for students for learning and development. The OBPP program sought to do this by implementing: (1) school-level strategies (e.g., training staff, introduce school rules against bullying, involving parents), (2) individual-level strategies (e.g., supervise students' activities, hold meetings with parents and with students involved in bullying), (3) classroom-level strategies (e.g., post and enforce anti-bullying rules school wide), and (4) community-level strategies (spread anti-bullying messages and principles in the community, develop partnerships with community members to support the school's anti-bullying program; Olweus & Limber, 2010). OBPP was initially offered to 2,500 students in grade four to seven, across 42 primary and junior high Norwegian schools. Data was first collected four months after

intervention launch in May 1983, then in May 1984, and again in May 1985. The guiding program principles including the belief that adults should be positive role models, function as authorities, set limits to unacceptable behavior and show warmth, involvement, and positive interest in student's lives. In addition, when rules are broken, youth should receive nonphysical, non-hostile negative consequences (Olweus, 2001; Olweus, 2007). Initial evaluation findings showed a reduction of self-reported bullying and victimization problems specifically, among grades five to eight, 62% reported a reduction in being bullied and 33% reported a reduction in bullying others after eight months of intervention (Olweus, 1997; Olweus & Limber, 2010). Important to note however, that there have been mixed opinions regarding the evaluation of the OBPP. For instance, there is a large amount of converging evidence supporting the effectiveness of the OBPP program to reduce bullying and victimization in Scandinavian schools, but smaller success rates have been found in Finland and Italy (Smith et al., 2004), and mixed findings were found in the United States. According to Smith and colleagues (2004), the success of this program in Scandinavian schools may be related to its historical context as the first systematic bullying research which made it unique and cannot be replicated. However, OBPP's evaluations results in the United States have not been consistent. For instance, the first evaluation of the OBPP took place in South Carolina in the mid-1990s among six rural elementary and middle school students who were primarily African American and from low income families (Limber, Nation, Tracy, Melton, & Flerx, 2004). The program results showed no significant changes in the frequency of reported victimization and it was discontinued one year after its implementation. In California, on the other hand, Pagliocca and colleagues (2007) implemented the program in three elementary schools and used a cohort design to evaluate the intervention over three years. Self-reported victimization showed 21% reduction after one year and 14% after two years.

Many interventions followed the whole-school approach of the OBPP, but questions remain about their effectiveness to reduce victimization (Smith et al., 2004). In response, Smith and colleagues (2004) conducted a synthesis of evaluation research review of 14 studies published from 1989 to 2002 to assess the efficacy of anti-bullying problems offered in a school context. Anti-bullying programs were implemented in primary and secondary schools and program components varied from school level (e.g., anti-bullying policy, increased supervision, information), parental level (e.g., information, staff training), classroom level (e.g., rules), peer level (e.g., peer-led interventions), and individual level (e.g., targeted interventions for bullies and

victims). Providing information in schools ($N = 11$) and to parents ($N = 10$) were the most common components among the studies, as well as focusing on curricular activities in classrooms ($N = 10$) and targeting interventions for bullies and victims at the individual level ($N = 10$). In terms of effectiveness, effect size (Cohen's *d*) for victimization were categorized as small (67%), and negligible (33%), and effect size (Cohen's *d*) for bullying outcomes were also categorized as small (33%) and negligible (67%). It is noteworthy to mention that this review compared between intervention and control groups and looked at the program conditions in seven anti-bullying programs, which also showed that victimization outcomes were negative or negligible in 86% of the studies, and small but positive in 14% of the studies, whereas self-reported bullying outcomes were negative or negligible in 100% of the studies.

A meta-analysis conducted by Merrell, Gueldner, Ross, & Isava (2008) identified 16 Europe and U.S. school-based, anti-bullying interventions. The authors included interventions from 1980 to 2004 that targeted small groups of students rather than school-wide programs, with a total of 15,386 student participants from primary and secondary schools. Interventions settings varied from a social skills program, teacher delivered program, anti-bullying policy program, school-wide program, and multi-level program across schools, parents, class, and individuals. Studies were classified based on: (1) student self-report of being bullied ($N = 10$), bulling others ($N = 8$), positive attitude toward bullying ($N = 4$), positive interactions with peers ($N = 4$), ignoring/refusing to join bullying ($N = 4$), reporting bullying ($N = 4$), witnessing bullying ($N = 3$), intervening to stop bullying ($N = 3$), teacher action/response towards bullying ($N = 3$), sympathy for victims ($N = 2$), and other variables ([$N = 1$]; feeling safe at school, anxiety/depression, global self-esteem, and social skills), (2) teacher self-report, (3) teacher report of child behavior, (4) peer report, and (5) school records. Interventions showed different outcome summaries that were conflicting. While significant positive effects were found in student self-report of bullying others ($N = 1$), being bullied ($N = 6$), witnessing bullying ($N = 5$), and global self-esteem ($N = 1$), other results showed significant negative effects in student self-report of bullying others ($N = 2$), being bullied ($N = 2$), and positive interactions with peers ($N = 1$). Specifically, interventions that had a teacher delivered peer victimization prevention program, peer-support model, and a collaborative school-wide program that focuses on positive environment and staff training showed significant decrease in bullying and victimization, while interventions

that focused on anti-bullying policy using peer supporters, education and problem-solving, and multi-level intervention were associated with negative outcomes.

A systematic review and meta-analysis conducted by Ttofi and Farrington (2011) to assess the effectiveness of anti-bullying programs in schools found 89 bullying prevention publications from 1983 to 2009, of which 44 were included in their effect size calculations for bullying or victimization. Study results revealed that effect sizes (Odds Ratios; *OR*) for smaller studies (*n* < 200) were non-statistically significant in reducing bullying with *ORs* ranging from 0.76 to 2.56. Only one out of nine randomized experiments had a significant effect on bullying, nine randomized experiments had a non-significant effect on bullying. On the other hand, 5 of the 14 intervention-control design studies were found to have a statistically significant effect, and the corresponding summary effect size (*OR)* was 1.6 (*p* < .0001). In between group comparison at post-intervention of the 41 studies, the weighted mean *OR* was 1.36 (*p* < .0001) suggesting a small effect of these programs on bullying which could be translated in 20-23% of reduction in bullying in the intervention group. Similarly, the weighted mean *OR* was 1.29 (*p* < .0001) which suggested a small effect of the programs (*N* = 41) on victimization and an overall reduction in bullying behavior that ranged between 17% to 23%. However, the overall *OR* values translate to small standardized mean difference (*d*) values of .17 and .14, respectively. Bullying reduction was mostly associated with program components that focused on improving playground supervision, disciplinary methods, parent training, information for parents, anti-bullying policies, cooperative group work, classroom rules, and school conferences, as well as with the duration, intensity and the number of elements included in the program.

Few studies have examined anti-bullying programs outside the school environment (Carney & Nottis, 2008). One pilot study examined the adaptation of a school based program, the Bully Busters program, to a summer day camp setting (Carney & Nottis, 2008). The Bully Busters program, was originally developed for students in grades Kindergarten to fifth grade and aimed to control and prevent bullying by increasing teachers' knowledge base, intervention skills, and awareness of how to tackle the root causes of bullying behavior (Horne et al, 2003). The adapted Bully Busters program to an out-of-school environment was offered in one summer camp located in a rural area in the Northeastern part of the United States. Six camp counselors were trained to carry out the program with the campers (number not reported), over a 10-weeks duration. Data on bullying incidents among campers were collected as well as counselor reports on bullying incidents

using standardized recording forms over a period of 10 weeks. Despite the challenges of implementing this program in an out-of-school setting (e.g., varying levels of education and training between the counselors), results showed that the program decreased bullying incidents in the summer camp from 25 to three. However, the author noted that a limitation of their study was the small sample size and recommended that larger scale study in other non-school settings be conducted. Therefore, more studies are needed to examine anti-bullying programs outside the school environment.

Evaluation of risk reduction approaches have demonstrated varying results and critiques of these programs include their heavy focus on reducing risk behaviors linked to bulling rather than developing prosocial behaviors, social support, self-worth, assertiveness skills (Battey, 2008; Hunt, 2007), and social norms that might dissuade bullies from engaging in harmful behaviors and empower victims and bystanders to standup for themselves (Battey, 2008; Carney, 2000; Hunt, 2007). Thus, a means to addressing these criticisms is to incorporate into anti-bullying interventions strategies that foster prosocial values, such as empathy, and provide adolescents with social and emotional learning skills among youth (Battey, 2008), rather than simply utilizing traditional 'risk reduction' approaches (Melendez-Torres et al., 2016).

Positive Youth Development (PYD).

Unlike interventions which focus on reducing the risks associated with bullying behaviors, positive youth development (PYD) programs are grounded in the philosophy that every individual is capable of positive change (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2004; Snyder & Flay, 2012) and by enhancing social emotional skills both at the interpersonal (e.g., relationship skills) and the intrapersonal (e.g., young people's strengths, resiliencies, and potentialities) level youth will be able to effectively cope with bullying in their environment (Damon, 2004). PYD programs provide a context for developing problem-solving skills, prosocial skills, coping mechanisms, and increasing self-worth, which help in reducing bullying behavior and improving the victim's coping mechanisms (Battey, 2008; Lodge & Frydenberg, 2005; Reid, Monsen, & Rivers, 2004).

A meta-analysis of peer-reviewed journals published between January 1990 and January 2010 was conducted by Lee, Kim, and Kim (2015) in order to determine the effectiveness of school-based anti-bullying programs on victimization among students in primary and secondary

schools, as well as to determine the most effective strategies utilized in these programs. Thirteen studies were included with a total of $N =19,619$ participants, and programs were divided into four categories: (1) social skill training (e.g., teaching coping skills and negotiation), (2) curriculum-based approaches (e.g., videotapes, lectures), (3) peer counseling (e.g., programs that trained students to become peer supporter in order to help another student involved in bullying, and (4) training in emotional control (e.g., teaching strategies to control emotional problems). The pooled effect size (Cohen's d) for the 13 studies showed a small, trivial but statistically significant effect of the school-based anti-bullying programs on victimization ($d = -.151$; $95\%CI = -.201, -.101$) $p < .001$), with a test of the heterogeneity in the effect reported $Q =39.625$ ($p < .001$) and $I^2 = 69.7\%$. Subgroup were based on comparing different characteristics within each study program, such as program duration, students' grade level, and program strategy. Curriculum-based approaches ($N =8$) showed a slightly larger, but small non-statistically significant effect size on victimization than the other studies that did not involve a curriculum-based approach ($d =-.197$ vs $d =-.13$, $p = .175$). Studies involving secondary school students ($N =4$) showed larger, but small statistically significant effect size on victimization than studies involving primary school students ($d =-.315$ vs $d =-.135$, $p < .05$), whereas studies with a program longer than 12 months in duration ($N =4$) showed larger, but small non-statistically significant effect size on victimization than the other studies ($d =-.225$ vs $d =-.24$, $p =.127$). Moreover, studies that implemented in its program studies training in emotional control, peer counseling, establishment of a school policy on bullying, or social skills training showed significantly larger effect sizes on victimization than other studies. Results suggested that training in emotional control, peer support training that focuses on effective communication skills, empathy, and active listening, are two effective strategies for anti-bullying programs, as well as an establishment of a school policy that focuses on preventing bullying, and targeting primary school students who are more willing to accept the program's curriculum and school policies.

One meta-analysis conducted by Polanin, Espelage, and Pigott (2012) aimed at identifying the treatment effect of anti-bullying programs on bystander intervention behavior and at identifying study characteristics that produced the largest treatment effect, found 11 studies published in a 30 years' period, that included participants from kindergarten through grade 12, and looked at a bystander intervention measure such as studies that measured intention to intervene, stop bullying, and direct intervention. Program characteristics varied from a curriculum based anti-

bullying program (e.g., focuses on awareness-building), a parental component, social and emotional skill-building, role-playing, enhancing capacity and responsibility, and social-cognitive training. The effect size used for calculation was originally the standardized mean difference (Cohen's *d*), but because of the small sample size, Hedge's small sample correction was applied. Results showed that there was a statistically significant positive weighted average ($g = .2$; $p <$ .001), but which translate into an increase in bystander intervention behavior by 20%. Results also showed that treatment effects were greater for high school samples which suggested that bystander behavior is a developmental process that may not influence younger students in a short period of time. Non-statistically significant findings were found in moderator analysis where neither the parental component of the intervention, not the facilitator of the intervention affected bystander intervention behavior. Nonetheless, the increase in bystander behavior found suggests the importance of focusing on bystander intervention behavior when developing anti-bullying interventions (Polanin et al., 2012).

One study examined the effect of a PYD-universal school-based program after one year of implementing The Steps to Respect Program, a program designed to promote social-emotional learning and prosocial beliefs through a classroom curriculum and involvement of staff training, on bullying and bystander behavior on playgrounds, social-emotional skills, and on children's bullying-related beliefs (Frey et al., 2005), among students ($N = 544$) in grades three to six, from six schools, in a longitudinal study using a cohort sequential design. Data screening of playground observations were collected two and a half months during pre and posttest period where each child was observed once a week, over the two 10-week periods, for a five-minute session and showed that 60.7% of the students bullied others, 47.8% encouraged bullying, and 56.4% were targeted for bullying. Effect size calculation (Cohen's *d*) showed that there was a reduction in bullying behaviors among those who were bullies in the pretest which provided an evidence of an intervention effect ($d = .31$). Bystander encouragement of bullying showed a similar pattern but with a less robust effect size ($d = .24$).

Therefore, PYD-based anti-bullying programs provide a context for promoting adolescents' social-emotional skills, which should reflect in more social behaviors, and fewer conduct problems (Collaborative for Academic, 2003; Payton et al., 2008).

PYD Programs with a Physical Activity Component.

Participation in a structured activity setting can have a positive influence on the development of adolescents and in the reduction of problem behaviors such as aggression and antisocial behavior (Fraser-Thomas et al., 2005; Mahoney, Larson, Eccles, & Lord, 2005). Development of competencies and assets occur during childhood and it includes but is not limited to acquiring physical and psychological health habits, forming positive skills toward school achievement, interacting with peers and adults through positive relationships, learning new tasks such as personal mastery/efficacy, and identity formation (Mahoney et al., 2005). Physical activity is one example of structured youth activities that are characterized by being organized, voluntary, supervised, and focused on skill-building (Mahoney et al., 2005). Physical activity can be structured into lessons in order to enhance this process of development and promote life skills, foster personal and interpersonal skills through peers and non-parental adult interactions, as well as the focus on conflict resolution, team building, and leadership (Fraser-Thomas et al., 2005; Weiss et al., 2008). In addition, youth can develop prosocial behavior through sharing, helping, and supporting others in a physical activity context (Rutten et al., 2008). For example, in these contexts, youth improve their skills by developing physical competencies through task orientation, develop social competency through peer relations, and learn responsibility by respecting the rights and feelings of others, (Danish, Forneris, Hodge, & Heke, 2004; Hellison, 1995). Participation in such settings is associated with reduced problem behaviors such as aggression and antisocial behavior. When youth interact with non-deviant peers, have positive role models, and are engaged in challenging and exciting activities they are also less likely to engage in problem behaviors (Mahoney et al., 2005). For instance, in a study conducted by Mahoney and Stattin (2000), which sought to examine the association between structured and unstructured leisure activities on antisocial behavior among 703 adolescents in grade eight, the researchers found that structured activity participation was associated with low antisocial behavior.

Further, participating in physical activity contexts has been found to be positively associated with physical and psychosocial constructs that affect both perpetrators and victims of bullying. Using data from a 2013 national survey, Sibold and colleagues (2015) found an association between physical activity, feeling sad, and suicidal ideation or suicidal attempt among bullied high school students ($N =13583$). Moreover, the researchers found that participating in physical activity for four or more days was associated with a 23% reduction in suicidal ideation or

attempt among bullied students, which showed that more participation in physical activity is associated with less sadness and suicidality in bullied adolescents, suggesting a need for the use of physical activity in anti-bullying programs (Sibold, Edwards, Murray-Close, & Hudziak, 2015).

However, when physical activity contexts are less staffed and structured, bullying can happen and goes unnoticed (Espelage & Swearer, 2003; Garner & Hinton, 2010; Olweus, 1993). In addition, the competitive and performance oriented social structures of physical activity context can promote antisocial behavior (Rutten et al., 2007). Rutten and colleagues (2007) conducted a study to examine the effect of organized youth sport on antisocial and prosocial behavior among soccer players and competitive swimmers, by focusing on the social-moral atmosphere and the social-moral reasoning about sport dilemmas. They included $N = 187$ adolescents from six soccer clubs and $N = 73$ adolescents from four swimming clubs in the Netherlands, ages ranged from 12 to 18 years, and study findings revealed that a positive social-moral atmosphere was negatively associated with antisocial behavior and positively associated with prosocial behavior. In addition, eight percent of the variance in antisocial behavior was attributed to characteristics of the environment. Examples of antisocial behavior such as violence and aggression have become to be common and acceptable in youth physical activity contexts (Fraser-Thomas et al., 2005; Gardner & Janelle, 2002), and morality development and reasoning have been found to decrease as youth grow into adulthood (Fraser-Thomas et al., 2005; Lemyre, Roberts, & Ommundsen, 2002). Therefore, programs should be structured accordingly in order to foster prosocial constructs among adolescents in schools and in out-of-schools' context, where bullying has been found to take place (Carney & Nottis, 2008; Garner & Hinton, 2010).

Thus, interventions that couple PYD philosophy and physical activity have the potential to create an engaging environment that fosters positive self-perceptions, as well as improve adolescents' social outcomes, mental well-being, psychological assets, and physical health. A recent formative evaluation of a pilot afterschool physical activity-based positive youth development program was conducted in the fall of 2015 of the 4H-Purdue Athletes Life Success program (4H-PALS), a physical-activity based PYD program designed to increase physical activity and improve developmental assets, as well as decrease heath risk behaviors among youth, through an integrative curriculum that follows the theory of triadic influence (TTI; Flay, Snyder, & Petraitis, 2009), an integrative framework for developing and evaluating PYD interventions, and examined three areas of the program: (1) curriculum implementation fidelity, (2) participant

engagement with curriculum and context, and (3) the social environment, among grade 5-6 students, through youth and leader interviews, as well as through observations, lesson plans, attendance, and feedback from the 4H-PALS intervention team (Riciputi et al., 2018). Results showed that the program was effective in creating an engaging and affirmative environment that foster positive self-perceptions (e.g., feeling accomplished) and enhance social skills for participants (e.g., interactions with others, caring, helpfulness, kindness). Similarly, a randomized control trial was conducted in order to assess the effectiveness of a PYD-based physical activity program on adolescents' physical and mental well-being, in 12 secondary schools in Hong Kong, where adolescents ($N = 331$) were randomly assigned to the intervention group from October 2013 to June 2014. The program focused was an afterschool sports mentorship which used sports to promote life skills and empower youth through ensuring physical and psychological safety of the students, building a helpful and constructive environment that focuses on supportive relationships and prosocial norms, and structuring the program effectively for skill building. After one month of the intervention completion, students in the intervention group reported better mental well-being, self-efficacy, resilience, flexibility, and physical activity levels than those in the control group. Results suggested that a physical activity based-PYD intervention has a potential in addressing adolescents' outcomes (Ho et al., 2017).

Taking together, it is important to consider physical activity-based positive youth development programs because they not only contribute to reduce bullying related behaviors, but also improve self-perceptions, enhance social skills, as well as improve adolescents' mental well-being, psychological assets, and physical health.

Present Study

While we know quite a bit about PYD programs and the influence of physical activity on bullying we know far less about the effectiveness of anti-bullying programs that combine PYD with a physical activity component. This gap in the literature represents a need to do research in this area as its' findings could inform prevention science research that seeks to decrease bullying through development of youth assets. Thus the overall objective of this study is to evaluate the effectiveness of PYD interventions that include a physical activity component and target bullying behaviors (bullying, victimization, and bystander) among pre- and young adolescents 8-14 years. As research on bullying continues to grow, researchers are calling for greater attention to

innovative approaches to address this public health issue. The study's findings have the potential to inform programmatic development focused on reducing bullying incidents and prevalence among youth through the development of youth assets. The addition of the physical activity context to this systematic review is crucial as it creates an engaging environment that fosters youths psychosocial and physical development, and more youths are participating in organized activities in schools and in out-of-school time, where bullying takes place and may go unnoticed (Espelage & Swearer, 2003; Garner & Hinton, 2010; Olweus, 1993).

ARTICLE

Overview

Bullying is an intentional repetitive behavior that is intended to do harm and is recognized as a public health problem among adolescents (Espelage & Colbert, 2015; Olweus & Limber, 2010), and it involves those who bully others (bullies), those who are bullied (victims), and those who observe, reinforce, assist, or defend the bully (bystanders; Olweus & Limber, 2010). National data on the prevalence of bullying indicates that 28% of students in grades six to 12 experience bullying (Lessne & Harmalkar, 2013), 30% of elementary, middle, and high school students bully others (Bradshaw et al., 2007), and 70% report witnessing bullying in their schools (Bradshaw et al., 2007). Moreover, students in elementary school report being bullied more (27%) than students in middle (25%) and high schools (19%; Rivara & LeMenestrel, 2016).

Consequences Linked to Bullying

Adverse health and behavioral consequences have been found among bullies, victims, and bystanders. For instance, perpetrators of bullying have been found to experience elevated risk for low academic achievement, poor school adjustment (Nansel et al., 2001), problems with alcohol and smoking (Moore et al., 2014; Nansel et al., 2001), and subsequent violent and criminal behaviors later in their life (Rigby, 2003). For instance, by examining social and legal outcomes among children, Olweus (1993) reported that youth with a history of bullying were four times more likely to be involved in criminality. Similarly, Losel, Ttofi, and Theodorakis (2012) found that bullying and victimization are linked to offending behavior and depression later in life. Moreover, in a prospective longitudinal study using birth cohort data, Moore and colleagues (2014) found that peer aggression is associated with mental health and substance use outcomes among youth, and that being a perpetrator of peer aggression at 14 years was associated with an increased risk of harmful alcohol use at 17 years. Bullying victims have also been found to experience adverse physical and psychosomatic problems such as stomach aches and sleeping problems (Rigby, 2003). For instance, Wolke, Woods, Bloomfield, and Karstadt (2001) found that victimized children report more physical symptoms compared to non-victimized children, whereas bullies report less physical or psychosomatic health problems compared to victims. Moreover,

38% of victims made up illnesses, 17% worried about school, and 11% of victims were four times more likely to complain of having a sore throat (Wolke, Woods, Bloomfield, & Karstadt, 2001). In addition, being a bystander puts youth at risk for experiencing psychological and behavioral problems (Polanin et al., 2012). For example, Rivers and colleagues (2009) found that bystanders had an elevated risk of experiencing anxiety, interpersonal sensitivity, and fear of being victimized compared to bullies. Furthermore, bystanders (30.4%) and youth who bullied others (1.4%) were at a higher level of predicted substance use, thus showing that commonalities exist between bullies and bystanders (Rivers et al., 2009).

Addressing Bullying

Risk-focused Interventions.

Anti-bullying interventions have focused on reducing the risk factors that contribute to bullying (Smith et al., 2004), and while reductions in bullying were found significant in some programs, other varying and non-significant results were found in different programs. For instance, Olweus (1993) developed the Olweus Bullying Prevention Program (OBPP) in the 1980s, a whole-school approach program which assumes that bullying is a systematic problem and interventions should be directed toward the entire school rather than individual bullies and victims, that aimed to reduce and prevent bullying incidents in schools through improving peer interactions peer-to-peer relations and restructuring the social environment into a safer more positive place for students for learning and development. Initial evaluation findings showed a reduction of self-reported bullying and victimization problems specifically, among grades five to eight, where 62% reported a reduction in being bullied and 33% reported a reduction in bullying others after eight months of intervention (Olweus, 1997; Olweus & Limber, 2010). However, that there have been mixed opinions regarding the evaluation of the OBPP. For instance, OBPP has been proven highly effective in reducing bullying in Scandinavian schools, smaller success rates have been found in Finland and Italy (Smith et al., 2004), and other mixed findings were found in the United States (Limber et al., 2004). Similar interventions showed varying results in reducing bullying (Smith et al., 2004). In one review of studies conducted by Smith and colleagues (2004) that assessed the evidence of the efficacy of anti-bullying problems with a whole-school approach which yielded 14 studies, victimization outcomes were negative or negligible in 86% of the studies, and small

but positive in 14% of the studies, whereas self-reported bullying outcomes were negative or negligible in 100% of the studies.

Risk reduction approaches have varying results and critiques of such programs center on the fact that they are based on reducing the behaviors of the bully rather than developing prosocial behaviors, social support, self-worth, assertiveness skills (Battey, 2008; Hunt, 2007), and social norms that empower victims and bystanders (Battey, 2008; Carney, 2000; Hunt, 2007). Therefore, anti-bullying interventions should center on fostering an environment of prosocial values, such as empathy, and provide adolescents with social and emotional learning skills (Battey, 2008), rather than the traditional 'risk reduction' approaches (Melendez-Torres et al., 2016).

Positive Youth Development (PYD).

Unlike interventions which focus on reducing the risks associated with bullying behaviors, positive youth development (PYD) programs are grounded in the philosophy that every individual is capable of positive change (Catalano et al., 2004; Snyder & Flay, 2012) and by enhancing social emotional skills both at the interpersonal (e.g., relationship skills) and the intrapersonal (e.g., young people's strengths, resiliencies, and potentialities) level youth will be able to effectively cope with bullying in their environment (Damon, 2004). PYD programs provide a context for developing problem-solving skills, prosocial skills, coping mechanisms, and increasing self-worth, which help in reducing bullying behavior and improving the victim's coping mechanisms (Battey, 2008; Lodge & Frydenberg, 2005; Reid, Monsen, & Rivers, 2004). Several studies have assessed the effectiveness of PYD-based anti-bullying programs and found that this approach is effective in reducing bullying. For instance, The Steps to Respect Program, a PYD-universal school-based program designed to promote social-emotional learning and prosocial beliefs through a classroom curriculum and involvement of staff training, on bullying and bystander behavior on playgrounds, social-emotional skills, and on children's bullying-related beliefs (Frey et al., 2005), was evaluated after one year of its implementation among students in grades three to six, and showed there was a reduction in bullying behaviors among those who were bullied in the pretest which provided an evidence of an intervention effect ($d = .31$). Bystander encouragement of bullying showed a similar pattern but with a less robust effect size ($d = .24$).

Therefore, PYD-based anti-bullying programs provide a context for promoting adolescents' social-emotional skills, which should reflect in more social behaviors, and fewer conduct problems (Collaborative for Academic, 2003; Payton et al., 2008).

PYD Programs with a Physical Activity Component.

When youth participate in a structured physical activity setting, they develop competencies and assets that includes acquiring physical and psychological health habits, forming positive skills toward school achievement, interacting with peers and adults through forming positive relationships, in addition to learning new tasks such as personal mastery/efficacy and identity formation. Such setting can have a positive influence on their development and in the reduction of problem behaviors such as aggression and antisocial behavior (Fraser-Thomas et al., 2005; Mahoney et al., 2005). Physical activity can be structured into lessons in order to enhance this process of development and promote life skills, foster personal and interpersonal skills through peers and non-parental adult interactions, as well as the focus on conflict resolution, team building, leadership, and prosocial behavior learnt through sharing, helping, and supporting others (Fraser-Thomas et al., 2005; Rutten et al., 2008; Weiss et al., 2008). Participation in such settings is associated with reduced problem behaviors such as aggression and antisocial behavior. When youth interact with non-deviant peers, have positive role models, and are engaged in challenging and exciting activities they are less likely to engage in problem behaviors (Mahoney et al., 2005). However, if such contexts are less staffed not structured appropriately, bullying can happen and go unnoticed (Espelage & Swearer, 2003; Garner & Hinton, 2010; Olweus, 1993). In addition, the competitive and performance oriented social structures of physical activity context can promote antisocial behavior (Rutten et al., 2007). Examples of antisocial behavior such as violence and aggression have become to be common and acceptable in youth physical activity contexts (Fraser-Thomas et al., 2005; Gardner & Janelle, 2002), and morality development and reasoning have been found to decrease as youth grow into adulthood (Fraser-Thomas et al., 2005; Lemyre et al., 2002). Therefore, programs should be structured accordingly in order to foster PYD constructs among adolescents in schools and in out-of-schools' context, where bullying takes place (Carney & Nottis, 2008; Garner & Hinton, 2010).

Thus, interventions that couple PYD philosophy and physical activity have the potential to create an engaging environment that fosters positive self-perceptions, as well as improve

adolescents' social outcomes, mental well-being, psychological assets, and physical health. A randomized control trial was conducted in order to assess the effectiveness of a PYD-based physical activity program on adolescents' physical and mental well-being, in 12 secondary schools in Hong Kong that focused on an afterschool sports mentorship which used sports to promote life skills and empower youth through ensuring physical and psychological safety of the students, building a helpful and constructive environment that focuses on supportive relationships and prosocial norms, and structuring the program effectively for skill building. After one month of the intervention completion, students in the intervention group reported better mental well-being, self-efficacy, resilience, flexibility, and physical activity levels than those in the control group. Results suggested that a physical activity based-PYD intervention has a potential in addressing adolescents' outcomes (Ho et al., 2017).

The combined approach of physical activity-based positive youth development program is important to consider as they not only contribute to reduce bullying related behaviors, but also improve self-perceptions, enhance social skills, as well as improve adolescents' mental well-being, psychological assets, and physical health.

Present Study

While we know quite a bit about PYD programs and the influence of physical activity on bullying we know far less about the effectiveness of anti-bullying programs that combine PYD with a physical activity component. This gap in the literature represents a need to do research in this area as its' findings could inform prevention science research that seeks to decrease bullying through development of youth assets. Thus the overall objective of this study is to evaluate the effectiveness of PYD interventions that include a physical activity component on bullying behaviors (bullying, victimization, and bystander) among pre- and young adolescents eight to 14 years. As research on bullying continues to grow, researchers are calling for greater attention to innovative approaches to address this public health issue. The study's findings have the potential to inform programmatic development focused on reducing bullying incidents and prevalence among youth through the development of youth assets. The addition of the physical activity context to this systematic review is crucial as it creates an engaging environment that fosters youths psychosocial and physical development, and more youths are participating in organized activities

in schools and in out-of-school time, where bullying takes place and may go unnoticed (Espelage & Swearer, 2003; Garner & Hinton, 2010; Olweus, 1993).

Methods

This systematic review followed recommendations outlined in the Preferred Reporting Items for Systematic Reviews and Meta Analyses (PRISMA; Moher, Liberati, Tetzlaff, & Altman, 2009). The research team included PYD expert (MM, FS, YR), a bullying expert (BB), a risky behavior expert (YR), a physical activity expert with extensive knowledge in systematic reviews (SA), and a health sciences information specialist (JR).

Inclusion/Exclusion Criteria

PYD interventions with a physical activity component that target bullying behavior among adolescents eight to 14 years old were identified and examined. The age range eight to 14 was selected as it marks the transition age from pre-adolescence into adolescence (Zimmer-Gembeck & Skinner, 2011) where bullying mostly occurs (Rivara & LeMenestrel, 2016). English language manuscripts published in peer-reviewed journals, up until January 2017 were included. Since bullying can manifest itself in three ways, bullies, victims, and bystanders (Olweus & Limber, 2010), the study's primary outcomes included bullying perpetration, victimization, and bystander involvement. Also, since bullying is a subtype of aggressive and antisocial behaviors (Olweus, 1994), interventions with anti-social behaviors and aggressive outcomes were also included. Interventions with positive youth development components that are based on character development and social-emotional learning such as lessons on self-concept, decision-making skills, self-improvement, and empathy were included (Beets et al., 2009). The term "physical activity component" refers to whether the PYD intervention offers educational lessons on physical activity promotion or opportunities for participants to engage in interactive physical activity lessons during the program. Excluded articles were non-peer-reviewed, editorials, opinions, book chapters, books, thesis, dissertations, reports, systematic reviews, meta-analysis, and review articles. Additionally, interventions that provided only cross-sectional data, that only explored neighborhood or gang violence as an outcome, and that did not include a physical activity component in the context of PYD intervention were also excluded.

Information Sources and Search Terms

A search strategy was developed by the research team and included identifying eligible studies from five electronic databases including PsycINFO, PubMed, CINAHL, Cochrane Library, and ERIC. The current review also conducted reference searches of included studies and other reviews (Cantone et al., 2015; Curran & Wexler, 2017; Durlak, Weissberg, & Pachan, 2010; Evans, Fraser, & Cotter, 2014; Hall, 2017; Lee et al., 2015; Melendez-Torres et al., 2016; Merrell et al., 2008; Polanin et al., 2012; Smith et al., 2004; Smith, Ananiadou, & Cowie, 2003; Ttofi & Farrington, 2011), information was requested from study authors ($n = 4$; only 3 replied and provided additional information).

Primary search terms included free-text, database-specific Index or Medical Subject Headings (MeSH) terms related to population (e.g., adolescent, youth, teen), AND intervention (e.g., positive action, positive youth development, socio-emotional, character development, afterschool, school-based, out of school time, social and emotional learning, social and emotional character development, positive psychology), AND context (e.g., physical activity, exercise, sport), AND primary outcomes (bullying, victimization, bystander). See Table 1 for a complete list of search terms by electronic database.

Study Selection and Data Extraction

A two-step review process was used (Figure 1). First, two reviewers (author # 1, research assistant) independently screened article titles and abstracts retrieved from databases ($n = 475$), and one reviewer (author # 1) conducted reference searches from reviews which yielded ($n = 5$) articles, yielding a total of ($n = 480$) articles. Then, a full-text review was carried out by two reviewers (author # 1, research assistant) independently if the title and abstract suggested eligibility or provided insufficient information to determine inclusion in study ($n = 64$). Results were compared, contrasted and discussed between the reviewers and the second author until consensus was reached. Following application of inclusion/exclusion criteria, the search yield seven independent studies.

Data extracted included article information (e.g., title, author, journal, year of publication), sample description statistics (e.g., sample mean age, age range, gender, ethnicity/race, level of education, socioeconomic status, recruitment location, and sample size), study design (e.g.,

experimental, quasi-experimental), primary outcome measures (measurement scale) and data collection method), PYD intervention components (e.g., developmental asset such as caring and respect), physical activity component (educational lessons, activities), theory used, description for comparison or control group, data and statistical information (mean, standard deviation, *P*-value, *t*-value, *F*-value, odds ratios, confidence intervals, standardized mean difference, and Pearson's correlation coefficient), risk of bias, and reported conflict of interest. Data-extraction tools were developed by the research team and authors (#s 1, 2, & 3) piloted on four studies with reviewers meeting to compare differences and identify refinements. Data from all studies were then independently extracted by two researchers (author #1, research assistant). Upon data extraction completion results were compared and contrasted among reviewers and the first author and when discrepancies arose the second author joined the discussion which continued until consensus was reached. Excel version 2016 was used to organize and analyze data. Characteristics of studies, interventions, and participants were summarized in tables.

Risk of Bias

Risk of bias was assessed for bullying, victimization, and bystander (with one set of ratings for each study) using the Cochrane Collaboration's tool for assessing risk of bias (Table 8; Higgins et al., 2016) by one reviewer (authors # 1). Information that answered questions on each bias category were extracted. Extracted information were compared, contrasted and discussed between the reviewers until consensus was reached The assessment tool included six categories of bias including: (1) selection bias which occurs when the study population does not represent the target population, through random sequence generation and allocation concealment, (2) performance bias which occurs when those recording or adjudicating outcomes, or data analysts are aware of the arm to which patients are allocated or of the study hypothesis, through blinding of participants and personnel, (3) detection bias defined as systematic differences in how outcomes are determined, through blinding of outcome assessment and measurement bias, (4) attrition bias defined as a systematic error caused by an unequal loss of participants which could lead to incomplete outcome data, (5) reporting bias is defined as selective suppression or revealing of information, and (6) failure to adequately control confounding. For each category, three qualitative ratings for evaluating the risk of bias were used: low (information reported and judged as methodologically

appropriate), high (information reported and judged as methodologically inappropriate), and unclear (information partially or not reported; Higgins et al., 2016).

Data Analysis

Study descriptive statistics on year of publication, sample size, sample mean age, sex and ethnicity were reported. Data required for effect size calculation (e.g., *mean*, *SD*, sample size, *F*-test value, odds ratios, correlation coefficients, and *P*-value) were also calculated. In order to report a common effect size for each quasi-experimental and experimental studies identified, Pearson correlation coefficient and standardized mean differences (Cohen's *d*) were used as summary measures, respectively. Statistical formulas were utilized to convert between reported effect sizes (Borenstein, Hedges, Higgins, & Rothstein, 2009). For example, for Rutten and colleagues (2010) quasi-experimental study, the Cohen's *d* was converted into a correlation coefficient in order to create an effect size measure that is reported by other correlational-study designs; likewise for experimental design studies, odds ratio measurements were converted into Cohen's *d* for the same purpose (Beets et al., 2009; Busch et al., 2013). Statistical formulas used for the conversions are presented in Figure 2.

Details on study population, study design, program and key components, theory used, and outcome measure scale were extracted. The variation in the magnitude and direction of effect sizes was assessed using Cohen's qualitative criteria, where Pearson correlation coefficient effect size was evaluated as small (*r* = .10 or *r* = -.10), medium (*r* = .30 or *r* = -.30), large (*r* = .50 or *r* = -.50), and very large (*r* = .70 or *r* = -.70), and standardized mean difference (Cohen's *d*) was evaluated as small (*d* = .20 or -.20), medium (*d* = .50 or -.50), large (*d* = .80 or -.80), and very large (*d* =1.30 or -1.30; Cohen, 1992; Rosenthal, 1996).

Results

Search Outcome

The search yielded 480 articles, of which 64 full-text manuscripts met the title and abstract screening. Of these 64 manuscripts, 57 did not meet the inclusion criteria and were thus excluded after full review, as described in Figure 1. Thus, a total of seven studies met the inclusion criteria. From these seven selected articles, seven assessed bullying behavior, one measured the prevalence

of victimization but did not analyze it (Gano-Overway, 2013), one assessed victimization (Busch et al., 2013), and two assessed bystander behavior (Gano-Overway et al., 2009; Rutten et al., 2010). Thus, the analysis is focused on seven studies assessing bullying, one study assessing victimization, and two studies assessing bystander behavior.

Characteristics of the Participants

Participant's age ranged from nine to 19 years of age, with a sample mean age of 14. Five studies had approximately equal gender representation ranging from 42% to 54% (Beets et al., 2009; Busch et al., 2013; Carraro, Gobbi, & Moè, 2014; Gano-Overway, 2013; Li et al., 2011). One study had a 78.2% females sample (Gano-Overway et al., 2009), and one study did not include females in its sample (Rutten et al., 2010). Studies varied in ethnicity distribution: African-American (1.6%-61%), White (4%-75%), Hispanics (26%-27%), Asian (0.5%-20.6%), other ethnic minorities described as Pacific Islander, Japanese, Native Americans, Vietnamese Americans, Samoan Americans, or other unspecified (1.6%-54%). Table 3 provides a full summary description of study participants.

Characteristics of the Bullying Outcomes Measures

Using bullying-specific scales, physical bullying was assessed in all seven articles using seven different scales including the Child Social Behavior Questionnaire (Warden et al., 2003), the Sports Behavior Inventory (Rutten et al., 2007), the University of Illinois Bully scale (Espelage & Holt, 2001), the Dutch Health Behavior in School-aged Children Questionnaire (Currie, Samdal, Boyce, & Smith, 2001; Wold, Smith, & Aaro, 1994), the Aggression Questionnaire (Bryant & Smith, 2001), a pilot survey (Beets et al., 2009), and the Aggression scale (Orpinas & Frankowski, 2001). In addition, verbal bullying was assessed in one study (Busch et al., 2013) using the Olweus Bully/Victim Questionnaire (Wang, Iannotti, & Nansel, 2009).

Different types of victimization (physical, verbal, and relational) were measured in one study (Busch et al., 2013) using the Olweus Bully/Victim Questionnaire (Wang et al., 2009).

Bystander involvement was measured in two studies as prosocial behavior or when bystanders intervene actively in a bullying situation to support the victim or end the bullying (Evans & Smokowski, 2015). Prosocial behavior was assessed using two different scales. The first study (Gano-Overway et al., 2009) used the Child Social Behavior Questionnaire (Warden et

al., 2003), which assesses inclusion, helping, sharing and caring (e.g., Sticking up for another child in your class who was in trouble). The second study (Rutten et al., 2010) used the Sports Behavior Inventory (Rutten et al., 2008, 2007), which assesses off-field prosocial behavior (e.g., 'If there's an argument in the changing room, I try to do something about it').

Results of the Individual Studies

Full summary of included studies and their characteristics are included in Table 4. Of the seven identified studies, three used a quasi-experimental design (two post-tests, one pre-post-test) while four employed an experimental design.

For quasi-experimental design studies, the main programs were a free five-week summer-based National Youth Sport Program (NYSP; Gano-Overway et al., 2009), a school-based Physical Education (PE) program (Gano-Overway, 2013), and an organized-youth sports forum theatre intervention (Rutten et al., 2010). The first program's components, the National Youth Sport Program (NYSP), sought to build positive assets through physical activity lessons that included a minimum of 50 instructional hours in sports/physical activity (e.g., basketball) and health education (e.g., awareness on substance use). For example, staff were trained and encouraged to model and reinforce healthy participation in physical activity while they actively highlighted when youth demonstrated respect, compassion, and integrity through sports. They were also encouraged to develop a caring relationship with the youth (Gano-Overway et al., 2009). The second program's components, the forum theatre in organized youth soccer, focused on a set of physical exercises, image techniques, and improvisation that aimed at using theatre as an effective tool for solving social and personal problems in organized youth soccer context (e.g., unfair game tactics, violating prosocial norms) where communication about norms and values within sports is stimulated, a cognitive moral conflict that can only be resolved through high levels of moral reasoning is provoked, and a positive moral atmosphere and moral cognitive growth are influenced, in an environment that is based on communication and mutual respect. Further, the intervention focused on promoting moral reasoning and fair play attitude among athletes (Rutten et al., 2010). The third program's components, the physical education program, focused on developing positive social behaviors (e.g., prosocial behavior, social competence) in physical education classes, as well as fostering a caring climate through physical education (Gano-Overway, 2013).

Only the NYSP study collected baseline data (Gano-Overway et al., 2009) while the forum theatre and the PE studies both collected only post-intervention data (Gano-Overway, 2013; Rutten et al., 2010). In terms of inclusion of participants, only the NYSP study specified their participant inclusion criteria, specifically, students from low-income families who may be eligible for free or reduced school lunch (Gano-Overway et al., 2009), neither the PE or the forum theatre program provided a participant inclusion criterion (Gano-Overway, 2013; Rutten et al., 2010). As for the use of a theoretical framework, the NYSP and the forum theatre studies both utilized the social cognitive theory (Bandura, 1989), a theory that describes the actions of others, influence of individual experience, and the environmental factors on the health behaviors of individuals (Gano-Overway et al., 2009; Rutten et al., 2010). No theory was discussed as guiding the development of the PE program (Gano-Overway, 2013).

Different context and methods for delivering the combined PYD and physical activity components were found among the three studies that used a quasi-experimental design: The NYSP study, a summer sports-based program, provided 50 instructional hours on physical activity and health education, and exposed youth to character developmental both through curriculum lessons on, for instance respect, and then through hands-on physical activity exercises and games. For example, after a lesson on respect, youth would play sports and during, staff would highlight when youth demonstrated examples of showing respect for others (Gano-Overway et al., 2009). The forum theatre intervention, an organized youth soccer context, delivered its components through a forum theatre performance where professional actors would give a performance at the soccer clubs on soccer-specific moral dilemmas and propose challenging solutions in front of an audience (parents and coaches) then a facilitator would explain to the audience the scene and invite them later to discuss the suggested solution (Rutten et al., 2010). The PE study, a school based program, delivered its components through physical education classes where teachers were involved, no further information was provided in the article (Gano-Overway, 2013).

The experimental design studies included the Utrecht Health School (UHS) program, a school based program (Busch et al., 2013), the play fighting program, a four-week school based physical education program (Carraro et al., 2014), the Positive Action program, a five-year school-based program delivered in Hawaii (Beets et al., 2009), and the Positive Action program, a two-year school-based trial program delivered in Chicago, Illinois (Li et al., 2011). The first program's components, the Utrecht Health School (UHS), sought to promote personal skills (e.g., prosocial

behavior, handling peer pressure) and empowering students to become active participants and to make healthier choices, as well as promoting healthy behaviors (e.g., one hour or more of physical exercise per day, healthy nutrition awareness, substance use reduction), refraining from compulsive behaviors (e.g., internet use and gaming), and focusing on health promotion of knowledge and skills. The second program's components, the play fighting program, focused on promoting social and emotional skills such as respect and fair behavior in physical activity, where youth are allowed to play roughly against each other but in a structured and supervised setting which would allow control over physical aggression by teaching the youth to respect their opponent and the rules of the specific game in physical activity. The third program's components, the Positive Action program, sought to promote social and character development through lessons that focused on body positive actions (e.g., physical activity), self-concept, emotional regulation, getting along with others, as well as encouraging honesty and self-improvement, through a structured curriculum (Beets et al., 2009). Similarly, the fourth program's components, the Positive Action program (the Chicago trial), has the same components listed in the previous point (Li et al., 2011).

All four studies collected baseline data (Busch et al, 2013; Carraro et al., 2014; Beets et al., 2009; Li et al., 2011). However, the Positive Action program that was based in Hawaii did not collect baseline data for participants who joined later during the intervention (Beets et al., 2009). In terms of inclusion of participants, the Utrecht Health School (UHS) program included youth between 13 and 14 years of age who went to a Secondary School (Busch et al., 2013), the play fighting program included students between 13 and 14 years of age in the eighth grade (Carraro et al., 2014), the Positive Action program implemented in Hawaii included youth between 10 and 11 years of age in the fifth grade who were eligible for free or reduced school lunch (Beets et al., 2009), and the Positive Action program implemented in Chicago included students in third to eighth grade, who were found to be at a high risk for behavioral problems (Li et al., 2011). As for the use of a theoretical framework, the UHS program did not report using any theoretical framework (Busch et al., 2013), the play fighting program was guided by the social-emotional learning theory (Damon, 2004), a theory designed to promote healthy outcomes by focusing on social, physical, intellectual, and emotional competencies (Carraro et al., 2014), and both of the Positive Action programs were guided by the theory of triadic influence (Flay et al., 2009), a theory that posits that three streams of influence (intrapersonal, social, and cultural-environmental) where

each stream has distal factors affecting individual behaviors that individuals have some control over and proximal factors affecting specific behavior that individuals have control over (Beets et al., 2009; Li et al., 2011).

Different context and methods for delivering the combined PYD and physical activity components were found among the four studies that used an experimental design: The Utrecht Health School (UHS) program, a school-based program (Busch et al., 2013), provided several teaching modules that focused on educational materials and several lessons where students were active participants in the UHS curricular activities that focused on health promotion and peer education where older students taught younger students about health-related topics (e.g., physical activity) which stimulated critical thinking and decision-making among youth. Further, teachers and parents were trained to build better communication and encourage youth's competencies to make healthier choices which would promote their well-being. The play fighting program, a school-based physical education program (Carraro et al., 2014), provided its activities during physical education lessons through a progression of games and exercises that placed students in situations where there is physical contact and opposition. The physical education teachers were the referee, allowing a direct teaching method and giving precise instructions in order to allow the students to regulate the activities by themselves, which provided a context for promoting social and emotional skills (Carraro et al., 2014). The Positive Action program, a school-based program, provided 140 lessons per grade per academic year, in periods of 15 to 20 minutes' long through an interactive approach that involved staff, teachers, and parents, where the teachers delivered the by engaging in structured discussions and activities (e.g., games, role-playing) on lessons that promote social and emotional learning (e.g., respect, empathy, moral development, decision-making) and physical activity (Beets et al., 2009; Li et al., 2011).

Bullying Outcomes

For the quasi-experimental design studies, different PYD constructs were utilized in the physical activity context and showed reduction in bullying behaviors. The National Youth Sport Program (NYSP), a summer-sports program (Gano-Overway et al., 2009), demonstrated that positive developmental assets such as caring and empathy significantly reduced youth's antisocial behavior. Further, empathic self-efficacy was used as a mediator between a caring climate and antisocial behavior and showed statistical significance in the indirect effect model, but not in the

direct between a caring climate and antisocial behavior. The forum theatre program, an organized youth soccer program (Rutten et al., 2010), showed that a positive moral atmosphere in organized youth sports contributed to reduced levels of antisocial behavior among young athletes. The physical education program, a school-based program (Gano-Overway, 2013), demonstrated that positive developmental assets such as caring significantly reduced youth's antisocial behavior. Further, affective empathy was used as a mediator between a caring climate and antisocial behavior and showed statistical significance (Table 5).

Statistical conversions (Borenstein et al., 2009) were performed to convert standardized mean difference (SMD) or Cohen's *d* coefficients (Rutten et al., 2010) into Pearson's correlation coefficient (*r*) as it was the reported metric in the two other studies (Figure 2; Gano-Overway, 2013; Gano-Overway et al., 2009). Pearson's correlation coefficient (*r*) for quasi-experimental studies ranged from -.24 to -.22 and an unadjusted analysis of *r* for these studies is provided in Table 6 (Gano-Overway, 2013; Gano-Overway et al., 2009; Rutten et al., 2010). As for adjusted models, the NYSP study adjusted for empathic self-efficacy in a mediation model between perceived caring and antisocial behavior with an *r* = -.06, and the physical education study adjusted for affective empathy between perceived caring and antisocial behavior with an *r* = -.32 (Gano-Overway, 2013). Those studies reported small effect sizes (Gano-Overway, 2013; Gano-Overway et al., 2009; Rutten et al., 2010).

For experimental design studies, no specific PYD constructs were measured across the bullying behavior, but the whole PYD approach explained in each intervention that was implemented with a physical activity component, and showed reduction in bullying behaviors. The Utrecht Health School (UHS), a school-based program (Busch et al., 2013), found that learning and adapting a health promotion perspective that focuses on healthy living through eating and physical activity, fosters personal asset development which in turn reduce bullying behavior. The play fighting program, a school-based physical education program, demonstrated that when students learned how to facilitate the control over aggressive behavior and help students manage and control their physical strength in games and exercises that involved physical contact reported lower self-reported aggressive behaviors (Carraro et al., 2014). The Positive Action intervention was utilized in two studies under two different geographical settings (one in Hawaii and one in Chicago, Illinois), yet both explored bullying behavior in their outcomes (Beets et al., 2009; Li et al., 2011). First, the Positive Action intervention in Hawaii found that students who received the

intervention reported significant lower levels of bullying behavior compared to the control group (rate ratio=0.42; 90% CI=0.24, 0.73), as measured from student and teacher reports. A dose-response relationship also explained that students with an increased level of exposure to this intervention showed more reduction in bullying behavior (Beets et al., 2009). Second, the Positive Action program in Chicago demonstrated a significant (41%) reduction (incidence rate ratio=0.59; 95% CI: 0.37-0.92) in bullying behavior through focusing on multiple aspects of character and social development which aided in changing the school environment and reducing bullying behavior (Li et al., 2011). While both interventions showed that there were declines in bullying behaviors in both trials, the Hawaii program (Beets et al., 2009) provided evidence of a dose-response effect which was not provided in the Chicago Program (Li et al., 2011). In addition to the dose-response effect found in the Hawaii program, Beets and colleagues (2009) also reported that students who were exposed for a shorter duration of the program (one or two years) still showed reduction in bullying behavior. A full summary of bullying outcomes is included in Table 5.

Statistical conversions (Borenstein et al., 2009) were performed to convert odds ratios to standardized mean difference (SMD) or Cohen's *d* coefficients as the play fighting study reported SMD (Carraro et al., 2014) and did not provide enough statistical metrics to convert the SMD into an odds ratio, which was the reported effect size in the other two studies (Figure 2; Beets et al., 2009; Busch et al., 2013). The Chicago Positive Action study reported the incidence rate ratio, however appropriate conversions were not possible due to insufficient information (Li et al., 2011). Consequently, the Li and colleagues (2011) study was dropped from the reported effect size measurement. As such, the effect size reported (SMD) ranged from $d = -.68$ to $-.27$ (Table 7), where three studies (UHS, play fighting, and Positive Action) reporting large (Busch et al., 2013; Carraro et al., 2014), and very large effect sizes (Beets et al., 2009). However, Beets et al. (2009) reported results from both students and teachers and there were differences in the effect size, specifically, student reports showed a very large effect size while teachers report demonstrated a small effect size, which was suggested may be due to the teachers' inability to observe students all the time which led to an underestimation of the measure (Beets et al., 2009).

Victimization Outcome

Victimization was only measured and assessed in one experimental design study, the Utrecht Health School (UHS) program (Busch et al., 2013). Compared with the control group, the

intervention group had a higher baseline level for their measure of victimization (being bullied), and showed statistical significant reduction after the program was implemented and completed with Odds Ratio $OR = .38$ ($95\% CI = .07, .63$). In order to compare the value of the reported OR with the effect size (Cohen's d) reported in the same study (UHS) for the bullying outcome, statistical conversions were done, and the calculated and a medium effect $d = -.53$ was found similar to the bullying effect (Table 7).

Bystander Involvement Outcomes

Prosocial bystander involvement, was only measured and assessed in two quasi-experimental design studies, the National Youth Sport Program (NYSP; Gano-Overway et al., 2009) and the forum theatre program (Rutten et al., 2010). In the NYSP study, perceived caring climate positively predicted prosocial behavior with a medium effect size of ($r = .37$) for the unadjusted effects model, whereas when empathic self-efficacy was used as a mediator between perceived caring climate and prosocial behavior, the direct effect of caring lost its statistical significance with a small/negligent effect size of ($r = -.05$) for the adjusted effects model. However, the indirect effects of the mediation model showed that empathic self-efficacy mediated the relationship between a perceived caring climate and prosocial behavior. Those results suggested that a PYD youth physical activity context fosters prosocial behavior through empathic self-efficacy. The forum theatre intervention measured and assessed off-field prosocial behavior and found zero differences between the pre-and the post-test with $d = 0$. In order to compare the effect of this intervention between prosocial and antisocial behavior, conversion of d to r yielded $r = 0$ which suggested that this intervention only showed statistically significant changes with antisocial behavior (Table 6).

Risk of Bias in Individual Studies

Evidence of different types of bias varied among studies. For quasi-experimental design studies, selection bias was high as no random sampling method was used or reported (Gano-Overway, 2013; Gano-Overway et al., 2009; Rutten et al., 2010). All three studies utilized a reliable and valid scale based on reported levels of Cronbach's alpha for their outcome measures which ranged from .6 to .9 (Gano-Overway, 2013; Gano-Overway et al., 2009; Rutten et al., 2010). A detailed explanation of the intervention was only provided in the forum theatre program (Rutten

et al., 2010). Similarly, only the forum theatre program provided information on how they overcame attrition to follow-up bias. Although not sufficient, Rutten and colleagues (2010) reported that 26% of participants in the pre-test did not participate in the post-test, in addition to performing a series of separate t-tests to compare the pre-test assessments of all outcome variables between the response group and the non-response group. Attrition to follow-up bias was high in all three studies (Gano-Overway, 2013; Gano-Overway et al., 2009; Rutten et al., 2010). Risk of confounding bias was also only assessed in the forum theatre program (Rutten et al., 2010) which suggested an unclear risk of confounding bias for the other two studies (Gano-Overway, 2013; Gano-Overway et al., 2009). Thus, quasi-experimental design studies had an overall high risk of bias which suggests low study quality.

As for experimental design studies, selection bias was high in the Utrecht Health School (UHS) program (Busch et al., 2013) as no random sampling method was described or reported. Selection bias was low in the play fighting program (Carraro et al., 2014), and both of the Positive Action programs (Beets et al., 2009; Li et al., 2011) where study samples were clearly described in each study and the criterion used to select participants was clearly reported, as well as random sampling method. Reliability and validity of scales for the outcome measures reported by measuring Cronbach's alpha varied among the studies. Neither the UHS program (Busch et al., 2013), nor the Positive Action program in Hawaii (Beets et al., 2009) report on a reliable and a valid scale level, while the play fighting program (Carraro et al., 2014) and the Positive Action program in Chicago (Li et al., 2011) reported varying levels of Cronbach's alpha that ranged from .57 to .88. All four studies provided a detailed explanation of their intervention, and only two Positive Action studies reported how they overcame selective attrition experienced (Beets et al., 2009; Li et al., 2011). Specifically, Beets and colleagues (2009) addressed selective attrition at the design level where they mentioned that the matched-pair design led to a 40 follow-up paired analyses that was conducted to provide evidence on the estimates from the two-level unmatched analyses. Moreover, Li and colleagues (2011) reported that half of the students who completed the questionnaire at the end of the three-year study period were also part of the original sample at baseline. All four studies but the play fighting study (Carraro et al., 2014) were deemed at low risks of confounding bias, as their analyses included age, socio-economic status, ethnicity, and school level. Experimental studies (Beets et al., 2009; Busch et al., 2013; Carraro et al., 2014; Li et al., 2011) with control group generally reported better study quality. Table 8 provides a detailed

report of risk of bias assessed utilizing the Cochrane's Collaboration's tool for assessing the risk of bias as low, high, or unclear (Higgins et al., 2016) and the full risk of bias assessment tool is included in Table 2.

Discussion

The purpose of this study was to evaluate the effectiveness of positive youth development interventions that include a physical activity component on bullying, victimization, and bystander involvement among pre- and young adolescents. Identified interventions implemented a combined PYD and physical activity approach in their programs and showed statistically significant results in the reduction of bullying and victimization behavior, as well as in the unadjusted model for the prosocial bystander behavior. Although small effect size measures were found in quasi-experimental design studies in both bullying and bystander outcomes, it may still have a practical significance based on the outcome (Durlak, 2009). According to Durlak (2009), an effect size of r = 0.2 that is based on behavioral measures of aggression is more clinically significant than an effect size of r = 0.6 that is based on attitudes toward that outcome, which is important to consider in order to understand the full meaning of research findings. As for experimental design studies, effect size measures varied from small to very large in both bullying and victimization outcomes but suggested that the interventions' approach has the potential to alleviate bullying. However, it is possible that there was an overestimation in the effect size calculated due to publication bias (Neely et al., 2010). Therefore, the practical significance of the measured outcomes and observed changes should be taken into consideration when understanding the meaning of research findings.

Different PYD components were identified in each intervention, and the majority focused on creating a caring and empathic environment that fosters youth development which is promising in alleviating bullying. For instance, the National Youth Sport Program (NYSP; Gano-Overway et al., 2009) which was a PYD intervention that focused on developing the constructs of caring and empathy, argued that a caring climate influenced self-efficacy among adolescents, which, in turn, helps them to control both their positive and negative emotions, and to be better able to empathize with others (Gano-Overway et al., 2009). To date, scholars who have examined the role of empathy in prosocial behavior regulation have found that parents who foster caring in their children by modeling and reinforcing this behavior are more likely to have children who can manage their emotions (Mussen & Eisenberg, 2001), consequently, a skill which has been found to help youth

develop emotional competence (Payton et al., 2000). Moreover, empathy facilitates everyday social interactions and plays a role in moderating the relation between prosocial behavior and emotional regulation (Lockwood, Seara-Cardoso, & Viding, 2014), which in turn can lead to a decrease in bullying behavior and to an increase in defending behavior (Gini, Albiero, Benelli, & Altoè, 2007). In a study examining the path relation between empathic responsiveness and bullying and defending behavior among 318 Italian adolescents with a mean age 13.2, Gini and colleagues (2007) found that low levels of empathic responsiveness was associated with more bullying, and higher levels was associated with students actively helping their victimized peers. Bullies in general are characterized with having low levels of empathy (Jolliffe & Farrington, 2006). In one study examining the association between cognitive and affective empathy and bullying among *n* = 720 adolescents, low levels of affective empathy were significantly associated with frequent bullying, which suggested that anti-bullying programs should focus on enhancing empathy (Jolliffe & Farrington, 2006). Thus, study results support current literature findings that a caring environment can lead to less antisocial behavior and bullying and that teachers, coaches, and/or parents can play a role in these efforts by influencing youth's ability to regulate their emotions and be more empathic (Gano-Overway et al., 2009). Moreover, a caring climate was found to effect both empathetic self-efficacy and affective self-regulatory efficacy, mediators toward prosocial and antisocial behavior (Gano-Overway et al., 2009), providing further support that when youth are able to identify and control their positive emotions, they are more cognitively able to enhance their social connectedness and experience other's emotions, which can result in them demonstrating kindness toward others and engaging in prosocial behaviors (Gano-Overway et al., 2009).

A combined PYD and physical activity approach was demonstrated across the seven studies where four studies were based on a physical activity or sports context: The National Youth Sport Program (NYSP; Gano-Overway et al., 2009), the forum theatre program (Rutten et al., 2010), the physical education program (Gano-Overway et al., 2013), and the play fighting physical education classes program (Carraro et al., 2014); while three studies included a physical activity component that was incorporated through lessons and activities: The Utrecht Health School (UHS) program (Busch et al., 2013), and both Positive Action programs (Beets et al., 2009, Li et al., 2011). Our results suggested that this approach is promising in reducing bullying behavior among youth as physical activity and sport participation can enhance adolescent's psychosocial

development and increase their awareness of prosocial values through providing them with opportunities in physical activity participation that enhances their learning and enable them to develop social competence, and improve their behaviors (Sanford, Armour, & DunCombe, 2007), which will also make them less likely to engage in problem behaviors (Mahoney et al., 2005). For instance, the NYSP program (Gano-Overway et al., 2009), the forum theatre program (Rutten et al., 2010), and the play fighting physical education classes (Carraro et al., 2014) focused on physical activity exercises and games in order to communicate about prosocial values and positive moral atmosphere. In such contexts, moral cognitive growth is stimulated, which in turn improves the moral climate in the physical activity context (Kavussanu, Seal, & Philips, 2006). This moral climate is associated with a reduction in antisocial behavior, and an increase in prosocial behavior (Power, Higgins, & Kohlberg, 1989). In addition, youth skill development is fostered in a mastery climate that is provided by physical activity and sports contexts, that focuses on individual progress and skill development, as well as moral reasoning and behavior. This mastery climate does not give any motive for moral transgression and antisocial behavior that could otherwise be demonstrated in other competitive contexts that do not focus on the various aspects of morality, and it is associated with more prosocial behaviors and less frequent antisocial behaviors (Kavussanu, Seal, & Philips, 2006). In one study examining the association between a perceived motivational climate, sportsperson-ship, social-moral functioning, and team norms among ($N =$ 279) male soccer players, between 12 and 14 years of age, players who perceived that the motivational climate is mastery-oriented showed higher levels of social-moral reasoning and sportsperson-ship behaviors (respect for rules and for others, avoids taking an unfair advantage over the opponent), and lower amoral behaviors (aggressive behavior; Ommundsen, Roberts, Lemyre, & Treasure, 2003). These findings support the fact that through physical activity settings, the outcomes of PYD programs are fostered among youth such as reduced problem behaviors.

The interventions duration varied across the studies, and while some argued that a longer duration of the program is associated with better observed outcomes (Beets et al., 2009), other statistically significant reductions in bullying behaviors were observed in shorter duration programs. For instance, the Positive Action program, which lasted for five years, demonstrated a dose-response relationship between program duration and program exposure on number of reported negative behaviors (Beets et al., 2009). However, exposing the youth for just one or two years was also associated with significant reduction in bullying behavior (Beets et al., 2009).

Interventions that lasted for four, five, and six weeks also showed statistically significant reductions in bullying behavior (Carraro et al., 2014; Gano-Overway et al., 2009), and significant increase in prosocial bystander behavior (Gano-Overway et al., 2009). This is in line with previous research examining the effect of short-term PYD interventions on youth outcomes. In one study examining the changes in hope among at-risk youth in a six-week PYD summer camp, campers reported positive changes in their hopeful thinking which suggested that the PYD program has a potential of change in the observed outcomes over a short-period of time (Kirschman, Roberts, Shadlow, & Pelley, 2010). Similarly, in a four-week PYD summer program, significant increase in global self-worth were found among youth which supported short-term changes (Ullrich-French, McDonough, & Smith, 2012), that can be maintained on the long-term (Ullrich-French & McDonough, 2013). In contrast, the Utrecht Health School (UHS) program (Busch et al., 2013) program took one year of designing and implementation in order to ensure its continuity and its long-term institutionalization. Such design followed the recommendations of Lee and colleagues (2006) who conducted a study to evaluate the effectiveness of a framework that enables education and health sectors to be more effective, and found that schools that needed further development in their staff training, and health promotion activities for family members, as well as broader coverage of health content in their curriculum were less effective in creating a safe school environment for learning and behavioral change. Thus, the point that time may play a role in helping youth build the skills necessary to avoid or prevent bullying behaviors is still unclear and further testing of this hypothesis is needed in future studies.

Most programs included in our review used an interactive approach where at least teachers or coaches were involved in the delivery of its components. For instance, the Positive Action program integrated a teacher-student communication opportunity and allowed for exchange of ideas in a nonthreatening environment (Beets et al., 2009; Li et al., 2011). Similarly, the NYSP's staff were encouraged to develop a caring relationship with the campers and reinforce character development through demonstrating and discussing respect and compassion (Gano-Overway et al., 2009). In organized youth sports, such as soccer, coaches play an important role in modeling behavior to their players and having behavioral expectations from their players that will make them more aware of the coach's disapproval of any antisocial behavior and would contribute to higher levels of moral reasoning (Pizarro, 2000; Rutten et al., 2007). These findings draw attention on the important role that teachers or coaches may play in influencing intervention effectiveness. Indeed,

research has found that the involvement of such role models in youth programming can influence youth engagement and motivation by establishing a supportive and caring program climate (Rhodes, 2004; Riciputi, 2016). This interactive relationship contributes to youth engagement in the program and provides them with emotional support which is important in such programs to build character assets and prosocial behaviors that are based on principles such as respect, fairness, and responsibility (Harter, 2012; McDonough, Ullrich-French, Anderson-Butcher, Amorose, & Riley, 2013; Riciputi, 2016). In addition, relationships with older mentors such as a teacher or a coach contributes to an improved youths' behavioral, intellectual and emotional functioning, and shows reduced problem behavior such as bullying or violence, increased physical activity levels, and increased psychological functioning (DuBois & Silverthorn, 2005; Riciputi, 2016). In addition to program staff some interventions included parental involvement as part of their curriculum. For instance, the UHS program involved parents in shaping the goals of the program in creating healthy behaviors by using an interactive learning techniques that focus on building better communication which helps in increasing students' competencies which empower them to make better decisions (Busch et al., 2013). Indeed, several aspects of parenting such as discipline, warmth, monitoring, and modeling of healthy behavior has been linked to positive youth developmental outcomes. Parents who are engaged in promoting youth healthy behaviors influence positively the level of social competence and engagement of their child, which in turn affect their child's development (Elder, Ayala, & Harris, 1999; Youngblade et al., 2007).

Limitations

Limitations of this study include, the small number of studies identified which did not allow for conducting a quantitative synthesis or meta-analyses which might affect the quality of effect size measurement calculated. Publication bias could be a possibility for the overestimation of the real effect size that is associated with the effectiveness of the interventions implemented. Another possible limitation is that qualitative or mixed-method designs were not included which would have captured actual quotes and findings that quantitative surveys don't. In addition, only one reviewer assessed the risk of bias of the included studies which affects the validity of the assessment. Despite the limitations, this study is the first to examine anti-bullying programs with a combined approach of PYD and physical activity, which showed the importance of examining anti-bullying programs through this lens.

Conclusion

To our knowledge, this study is the first systematic review that examines both PYD and physical activity anti-bullying programs. Our results showed that such approach has a potential in alleviating bullying and victimization, and increase in prosocial bystander behavior, both in school and out-of-school contexts. Thus, when planning anti-bullying prevention programs, this approach should be taken into consideration especially given that focusing solely on risk reduction has not proven to be consistently effective. As such, anti-bullying programs would focus on incorporating a combined approach of PYD components such as caring, empathy, and respect in a physical activity context that can be delivered either in activities or in lessons, which fosters youth's psychosocial development and provide them with opportunities to develop these PYD components in a mastery-oriented climate, which in turn may reduce problem behaviors. Further, an interactive and supportive approach between the participants and the program's staff can be helpful in promoting personal skills, which in turn may reduce bullying behavior. Further, our findings could potentially inform or guide other systematic reviews and/or meta-analysis.

CONCLUSION

This systematic review was designed to investigate the impact of positive youth development, physical activity-based interventions on bullying among adolescents aged 8 to 14 years old. Studies that examined bullying and/or victimization and bystander involvement were retrieved and assessed in the results. To our knowledge, this is the first systematic review that examines PYD interventions that are delivered through a physical activity context to target bullying behaviors among adolescents. Interventions that utilize a combined approach of PYD components such as caring, empathy, respect, compassion, moral reasoning and self-concept and physical activity context that can be delivered either in activities or in lessons, have the potential to foster youth's psychosocial development and provide them with opportunities to develop these PYD components in a mastery-oriented climate, which in turn may reduce problem behaviors. Further, an interactive and supportive approach between the participants and the program's staff can be helpful in promoting personal skills, which in turn may reduce bullying behavior. The question whether the duration of the program is associated with its effectiveness on reducing bullying behaviors is a potential a priori hypothesis that can be tested in further studies.

In terms of future implications, our study only yielded seven articles that assessed anti-bullying programs through the combined approach of PYD and physical activity. From these seven articles, only two assessed bystander involvement, and one assessed victimization. As such, more interventions are needed to address these three categories of bullying given the consequences associated with each one of them. Interventions should focus on the different components highlighted in the results. Further, our findings could potentially inform or guide other systematic reviews and/or meta-analysis.

This study has several limitations. The small number of studies identified which did not allow for conducting a quantitative synthesis or meta-analyses which might affect the quality of effect size measurement calculated. It is also possible that the effect size measures calculated are inflated due to publication bias which tend to overestimate the real effect size that is associated with the effectiveness of the interventions implemented. Another possible limitation is that qualitative or mixed-method designs were not included which would have captured actual quotes and findings that quantitative surveys don't. In addition, only one reviewer assessed the risk of

bias of the included studies which affects the validity of the assessment. Despite the limitations, this study is the first to examine anti-bullying programs with a combined approach of PYD and physical activity, which showed the importance of examining anti-bullying programs through this lens.
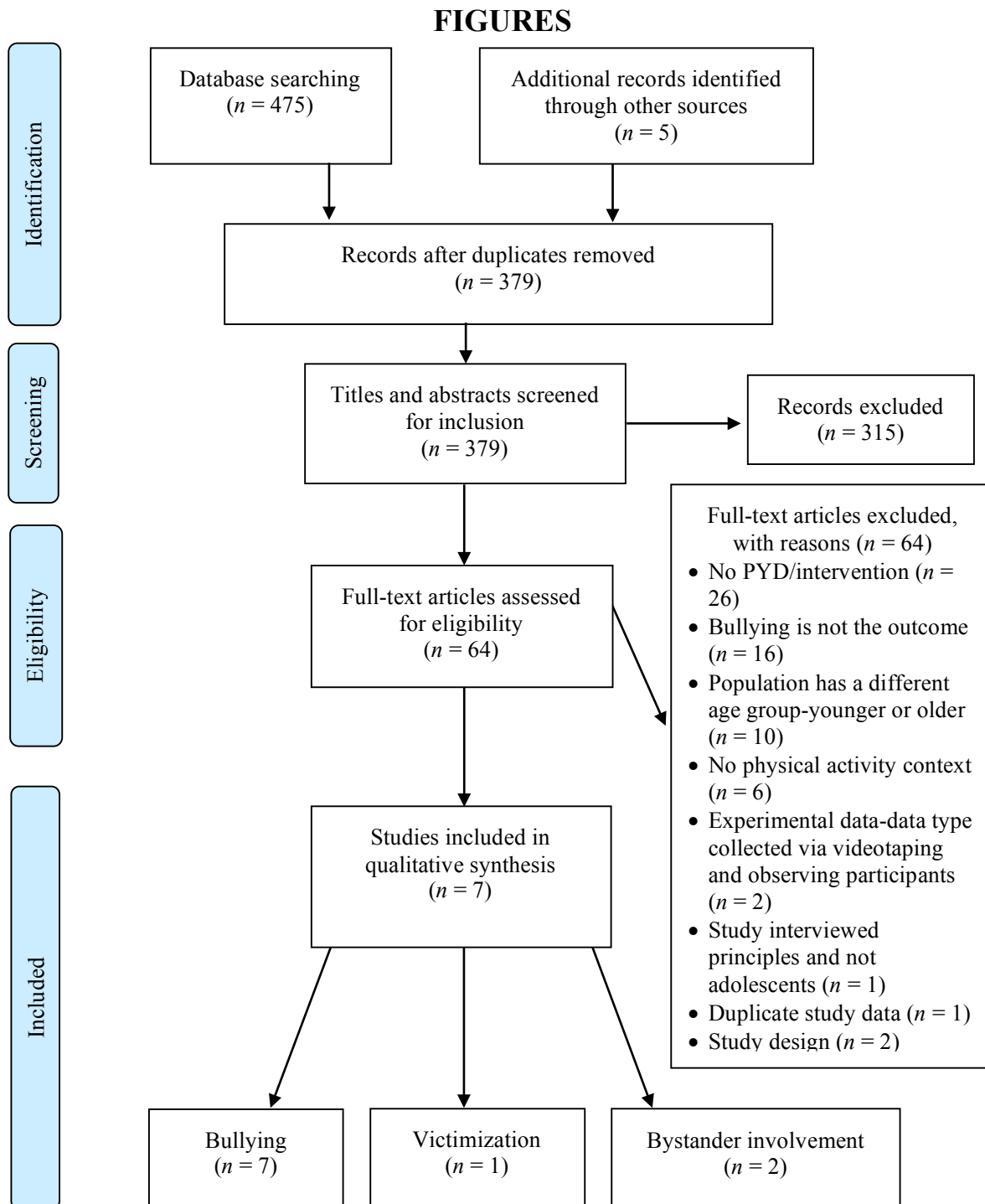
FIGURES

Figure 1. PRISMA flow diagram of research outcome and study selection
(adapted from Moher et al., 2009)

To convert from log odds ratio (LogOddsRatio) to the standardized mean difference d:

$$d = LogOddsRatio \times \frac{\sqrt{3}}{\pi}$$

"π" is a mathematical constant (3.14), and the variance of d is:

$$V_d = V_{LogOddsRatio} \times \frac{3}{\pi^2}$$

To convert from a standardized mean difference (d) to a correlation (r):

$$r = \frac{d}{\sqrt{d^2 + a}}$$

where "a" is a correction factor for cases where n1≠ n2,

$$a = \frac{(n_1 + n_2)^2}{n_1 n_2}$$

Figure 2. Statistical formulas used for conversion between effect size measurements (Borenstein, et al., 2009)

TABLES

Table 1. Documenting the search

Name of the database		MEDLINE (Pubmed: 1966 +)
Date of the search		January 2017
Initials of the person who ran the search		EM
Search terms / MeSH Search fields: Title and abstract	S1	Adolesc* OR yout* OR teen* OR "middle school*" OR "child"[Mesh] OR "adolescent" [Mesh] OR child OR children OR pre-adolescent OR preteen OR pre-teen OR school-aged OR "junior high" OR "elementary school"
	S2	"positive action" OR "positive youth development" OR "socio-emotional" OR "character development" OR "afterschool" OR "after-school" OR "school-based" OR "out of school time" OR "moral development" OR prosocial OR "social and emotional learning" OR "social and emotional character development" OR "Positive Psychology"
	S3	intervention* OR program* OR "summer camp"
	S4	S2 AND S3
	S5	"physical activity" OR exercise OR sport OR "motor activity" [Mesh] OR "exercise" [Mesh] OR "recreational sport"
	S6	("Social Distance"[Mesh]) OR "Rejection (Psychology)"[Mesh]) OR "Social Isolation"[Mesh] OR Bullying[Mesh] OR Aggression[Mesh] OR "Harassment, Non-Sexual"[Mesh] OR "Social Desirability"[Mesh] OR bully* OR violen* OR "school violence" OR cyberbullying OR "verbal bullying" OR "social bullying" OR "relational aggression" OR "Antisocial behavior" OR perpetrators OR teasing OR "physical bullying" OR harrass* OR ostraci* OR ostracism OR exclusion OR "social exclusion" OR reject* OR shun*
	S7	Social Isolation"[Mesh] OR "Social Behavior" [Mesh] OR Victim* OR "peer pressure" OR "peer victimization" OR victimization OR bullyvictim
	S8	observer* OR "bystander effect" OR "bystander apathy" OR bystander* OR alturism OR "alturistic" OR "victim helper" OR "bully helper"
Number of hits	S9	S1 AND S4 AND S5 AND S6 = **136**
	S10	S1 AND S4 AND S5 AND S7 = **15**
	S11	S1 AND S4 AND S5 AND S8= **14**

Name of the database	CINAHL (1982 +)	
Date of the search	January 2017	
Initials of the person who ran the search	EM	
Search terms / CINAHL descriptor Search fields: Title and abstract	S1	Adolesc* OR yout* OR teen* OR (MH "Students, Middle School+") OR (MH "Adolescence+") OR (MH "Child") OR child OR children OR pre-adolescent OR preteen OR pre-teen OR school-aged OR "junior high" OR "elementary school"
	S2	"positive action" OR "positive youth development" OR "socio-emotional" OR "character development" OR "afterschool" OR "after-school" OR "school-based" OR (MH "Adolescent Development+") OR (MH "Child Development+") OR "out of school time" OR "moral development" OR prosocial OR "social and emotional learning" OR "social and emotional character development" OR "positive psychology"
	S3	intervention* OR program* OR "summer camp" OR (MH "Recreation")
	S4	S2 AND S3
	S5	"physical activity" OR exercise OR sport* OR (MH "Physical Activity+") OR (MH "Exercise+") OR "recreational sport"
	S6	(MH "Social Isolation") OR (MH "School Violence") OR (MH "Verbal Abuse") OR (MH "Cyberbullying") OR (MH "Bullying") OR "bully" OR (MH "Aggression") OR bully* OR violen* OR "school violence" OR cyberbullying OR "verbal bullying" OR "social bullying" OR "relational aggression" OR "Antisocial behavior" OR perpetrators OR teasing OR "physical bullying" OR harrass* OR MH "bullying, Internet" OR ostraci* OR ostracism OR exclusion OR "social exclusion" OR reject* OR shun*
	S7	"victimization" OR (MH "Victims") OR Victim* OR "peer pressure" OR "peer victimization" OR victimization OR bully-victim
	S8	bully-bystander OR observer* OR "bystander effect" OR "bystander apathy" OR bystander* OR altruism OR "altruistic" OR "victim helper" OR "bully helper"
Number of hits	S9	S1 AND S4 AND S5 AND S6 = **40**
	S10	S1 AND S4 AND S5 AND S7 = **7**
	S11	S1 AND S4 AND S5 AND S8= **0**

Name of the database	PsycINFO (1806 +)	
Date of the search	January 2017	
Initials of the person who ran the search	EM	
Search terms / PsycINFO Thesaurus Search fields: Title and abstract	S1	Adolesc* OR yout* OR teen* OR "Middle School Students" [Thesaurus term] OR child OR children OR pre-adolescent OR preteen OR pre-teen OR school-aged OR "junior high" OR "elementary school"
	S2	"positive action" OR "positive youth development" OR "socio-emotional" OR "character development" OR "afterschool" OR "after-school" OR "school-based" OR "out of school time" OR "moral development" OR prosocial OR "social and emotional learning" OR "social and emotional character development" OR "Positive Psychology"
	S3	intervention* OR program* OR "summer camp"
	S4	S2 AND S3
	S5	"AfterSchool Programs" [Thesaurus term] OR "After School Programs" [Thesaurus term]
	S6	S4 OR S5
	S7	"physical activity" OR exercise OR sport OR sports OR "physical activity" [Thesaurus term] OR "exercise" [Thesaurus term] OR "recreational sport"
	S8	MM "Social Isolation" OR DE "Relational Aggression" OR DE "Verbal Abuse" OR DE "Bullying" OR DE "Cyberbullying" OR DE "Aggressive Behavior" OR DE "Antisocial Behavior" OR DE "Conflict" OR DE "Dominance" OR DE "Harassment" OR DE "Perpetrators" OR DE "Physical Abuse" OR DE "School Violence" OR DE "Teasing" OR DE "Threat" OR bully* OR violen* OR "school violence" OR cyberbullying OR "verbal bullying" OR "social bullying" OR "relational aggression" OR "Antisocial behavior" OR perpetrators OR teasing OR "physical bullying" OR harrass* OR ostraci* OR ostracism OR exclusion OR "social exclusion" OR reject* OR shun*
	S9	DE "Victimization" OR "peer pressure" OR "peer victimization" OR victimization OR "bully-victim*" OR target
	S10	DE "Bystander Effect" OR Bystander* OR DE "Observer" OR "bystander effect" OR "bystander apathy" OR altruism OR "altruistic" OR "victim helper" OR "bully helper"
Number of hits	S11	S1 AND S6 AND S7 AND S8 = **65**
	S12	S1 AND S6 AND S7 AND S9 = **107**
	S13	S1 AND S6 AND S7 AND S10 = **4**

Name of the database	Cochrane library: Central register of controlled trials (1996 +)	
Date of the search	January 2017	
Initials of the person who ran the search	EM	
Search terms / MeSH Search fields: Title and abstract	S1	Adolesc* OR yout* OR teen* OR "Child" [MeSH term] OR "middle school*" OR "Adolescent" [MeSH term] OR child OR children OR pre-adolescent OR preteen OR pre-teen OR school-aged OR "junior high" OR "elementary school"
	S2	"positive action" OR "positive youth development" OR "socio-emotional" OR "character development" OR "afterschool" OR "after-school" OR "school-based" OR "out of school time" OR "moral development" OR prosocial OR "social and emotional learning" OR "social and emotional character development" OR "Positive Psychology"
	S3	intervention* OR program* OR "summer camp"
	S4	S2 AND S3
	S5	"physical activity" OR exercise OR sport OR sports OR "Exercise" [MeSH term] OR "recreational sport"
	S6	Bullying[Mesh] OR Aggression[Mesh] OR bully* OR violen* OR "school violence" OR cyberbullying OR "verbal bullying" OR "social bullying" OR "relational aggression" OR "Antisocial behavior" OR perpetrators OR teasing OR "physical bullying" OR harrass* OR ostraci* OR ostracism OR exclusion OR "social exclusion" OR reject* OR shun*
	S7	Social Isolation or "Social Behavior" or "Social Marginalization" or Victim* or "peer pressure" or "peer victimization" or victimization or bully-victim*
	S8	observer* or "bystander effect" or "bystander apathy" or bystander* or altruism or "altruistic" or "victim helper" or "bully helper"
Number of hits	S9	S1 AND S4 AND S5 AND S6 = **41**
	S10	S1 AND S4 AND S5 AND S7 = **21**
	S11	S1 AND S4 AND S5 AND S8= **15**

Name of the database	ERIC	
Date of the search	January 2017	
Initials of the person who ran the search	EM	
Search terms / ERIC Thesaurus Search fields: Title and abstract	S1	((DE "Adolescents" OR DE "Children")) OR (DE "Youth") OR adolesc* OR yout* OR teen* OR DE "Middle School Students" OR child OR children OR pre-adolescent OR preteen OR pre-teen OR school-aged OR "junior high" OR "elementary school"

	S2	"positive action" OR "positive youth development" OR "socio-emotional" OR "character development" OR "afterschool" OR "after-school" OR "school-based" OR "out of school time" OR "moral development" OR prosocial OR "social and emotional learning" OR "social and emotional character development" OR "Positive Psychology"
	S3	intervention* OR program* OR "summer camp"
	S4	S2 AND S3
	S5	"physical activity" OR exercise OR sport OR sports OR "recreational sport" OR DE "Exercise"
	S6	(DE "Social Isolation") OR (DE "Rejection (Psychology)") OR ((DE "Bullying") OR (DE "Violence")) OR (DE "Antisocial Behavior" OR DE "Aggression" OR DE "Social Distance" OR DE "Violence") OR bully* OR violen* OR "school violence" OR cyberbullying OR "verbal bullying" OR "social bullying" OR "relational aggression" OR "Antisocial behavior" OR perpetrators OR teasing OR "physical bullying" OR harrass*OR ostraci* OR ostracism OR exclusion OR "social exclusion" OR reject* OR shun*
	S7	DE "Victims" OR DE "Victims of crime" OR "peer pressure" OR "peer victimization" OR victimization OR "bully-victim" OR target
	S8	DE "Bystander Effect" OR bystander OR observer* OR "bystander effect" OR "bystander apathy" OR altruism OR "altruistic" OR "victim helper" OR "bully helper"
Number of hits	S9	S1 AND S4 AND S5 AND S6 = **8**
	S10	S1 AND S4 AND S5 AND S7 = **4**
	S11	S1 AND S4 AND S5 AND S8= **1**

Table 1. Risk of bias extraction sheet

Study	Selection Bias					Information Bias	Information Lack of Blinding Bias	Bias introduced by failure to maintain integrity of the intervention	Selection attrition to follow-up bias	Failure to adequately control confounding	Selective outcome reporting		
	1. Is a clear definition of the population under study provided?	2. Is it reported in the article how the participants were sampled or selected?	3. Was a random sampling method used?	4. Are the eligibility criteria clearly reported?	5. Was the eligibility criteria applied appropriately?	6. Was the bullying outcome accurately measured?	7. Were those recording the outcomes, those adjudicating the outcomes, or data analysts blinded?	8. Is the intervention well described?	9. Were all the recruited and randomized included in the analyses?	10. Were all the relevant adjustment variables included in the analyses?	11. Was the bullying outcome measured?	12. Was the bullying outcome analyzed?	13. Was the bullying outcome partially not reported because of the statistical or practical significance?
Gano-Overway et al. (2009) National Youth Sport Program (NYSP)	Yes	No	No	Yes	Unclear	Yes	No	No	No	Unclear	Yes	No	Probably yes
Rutten et al. (2010) Forum Theatre Intervention	Yes	No	No	No	Can't tell	Yes	Unclear	Yes	Yes	Yes	Yes	Yes	Probably no

Table 2 continued

Gano-Overway (2013) Physical Education Program	Yes	Yes	No	Unclear	Can't tell	Yes	No	No	No	Unclear	Yes	Yes	Probably no
Busch et al. (2009) The Utrecht Health School (UHS)	Yes	No	No	No	Can't tell	Yes	No	No	No	Yes	Yes	Yes	Probably no
Carraro et al. (2014) Play Fighting Intervention	Yes	Yes	Yes	No	Can't tell	Yes	No	Yes	Unclear	Unclear	Yes	Yes	Probably no
Beets et al. (2009) Positive Action Program	Yes	Yes	Yes	Yes	Yes	Unclear	No	Yes	Yes	Yes	Yes	Yes	Probably no
Li et al. (2011) Positive Action Program	Yes	Yes	Yes	Yes	Yes	Yes	Unclear	Yes	Yes	Yes	Yes	Yes	Probably no

Table 2. Summary of individual studies and sample characteristics

Title/ Authors	Sample size	Sample Mean Age	Sample Age Range	% of Female	Ethnicity/Race	Country
Gano-Overway et al. (2009) National Youth Sport Program (NYSP)	395	11.8	9 to 16	78.2	• African Americans (61%) • Hispanic Americans (26%) • White Americans (4%) • Other (10%)	United States
Rutten et al. (2010) Forum Theatre Intervention	99	14.6	10 to 18	0	• White (46%) • Ethnic minorities (54%)	Netherlands
Gano-Overway (2013) Physical Education Program	528	12.3	10 to 15	54	• White (75%) • Ethnic minorities (25%)	United States
Busch et al. (2013) The Utrecht Health School (UHS)	2007 = 220 2010 = 136	not indicated	12 to 13	2007 = 54 2010 = 47	• not indicated	Netherlands
Carraro et al. (2014) Play Fighting Intervention	210	13.2	13 to 15	42	• not indicated	Italy
Beets et al. (2009) Positive Action Program	Control = 738 Intervention = 976	not indicated	10 to 11	50	• Hawaiian (26.1%) • Asian (25.2%) • Multiple ethnic backgrounds (22.6%) • Other (12.5%) • Non-Hispanic White (8.6%) • African American (1.6%) • American Indian (1.7%) • Unknown (1.6%).	United States
Li et al. (2011) Positive Action Program	590	not indicated	not indicated	Control = 49 Intervention = 51	• 46% African-American • 27% Hispanic • 17% mixed or other • 7% Non-Hispanic White • 3% Asian	United States

Table 3. Summary of the interventions

Study authors & program name	Study Design	Scale	Physical-Activity Based-PYD Intervention	Theory

Gano-Overway et al. (2009)
 	
National Youth Sport Program (NYSP)
	One group post-test	The Child Social Behavior Questionnaire (Warden et al., 2003)	• Summer based program
			• Physical activity and health education - 50 instructional hours
			• PYD:
			  o Encourage participation and positive psychosocial development
			  o Building character assets (e.g., respect, citizenship, and sportsmanship)
				Social-cognitive theory

Rutten et al. (2010) Forum Theatre Intervention	One group Pre-test Post-test	Sports Behavior Inventory (SBI) (Rutten et al., 2007)	• Organized youth activities context • Soccer-specific moral dilemma: unfair game tactics • Physical exercises where communication about norms and values are stimulated • PYD: prosocial behavior and moral team atmosphere	Social-cognitive moral theory
Gano-Overway (2013) Physical Education Program	One group post-test	The University of Illinois Bully scale (UIBS) (Espelage & Holt, 2001)	• School-based • Physical education (PE) classes: 3 to 4 times a week • PYD: empathy, caring, prosocial and antisocial behaviors	not indicated
Busch et al. (2013) The Utrecht Health School (UHS)	Pre-Post test	The Dutch Health Behavior in School-aged Children (HBSC) questionnaire (Currie, Samdal, Boyce, & Smith, 2001; Wold et al., 1994) The Olweus Bully/Victim Questionnaire measures (Wang et al., 2009)	• The Utrecht Healthy School • A whole-school approach that focuses on applying a healthy school policy, creating a healthy school environment, promote health behaviors (including physical activity), developing personal skills • Physical activity promotion • Involves the outside of school environment (e.g., parents, public health authorities' services) • PYD: developing personal skills	not indicated
Carraro et al. (2014) Play Fighting Intervention	Randomized Control Trial	Aggression Questionnaire (Bryant & Smith, 2001)	• Play Fighting Intervention • School-based • Focuses on development of exercises and games that involved students in situations associating any physical contact • Students are taught how to regulate the activities by themselves with the supervision of the physical education teacher and the researcher, assuming the role of referee of the games if needed • PYD: promote respect and fair behavior	Social emotional learning theory

Table 4 continued

Beets et al. (2009) Positive Action Program	Randomized Control Trial	Pilot survey	• The Positive Action (PA) program • A multicomponent school-based social and character development program designed to improve academics, student behaviors, and character. • Program applied over five years • Physical activity lessons • PYD: Lessons focus on self-concept, mind and positive actions, physical activity, social and emotional actions for managing responsibility, etc.	Theory of triadic influence
Li et al. (2011) Positive Action Program	Randomized Control Trial	Aggression Scale (Orpinas & Frankowski, 2001)	• The PA program (see above): schools received a portion of the PA classroom curriculum, in addition to school and staff training from the developers of the program. • Schools received kits for school preparation, school-wide development, and counsellors and family classes. • Applied in a different context (Chicago) over a different period of time (two years)	Theory of triadic influence

Table 4. Summary of the bullying outcomes (bullying, victimization, bystander involvement)

Study Design	Study	Outcomes
Quasi-Experimental	Gano-Overway et al., (2009) National Youth Sport Program (NYSP)	• Caring and empathy showed significant reduction in youth's antisocial behavior and increase in prosocial bystander behavior • A positive moral atmosphere in organized youth sports contributed to reduced levels of antisocial behavior among young athletes
	Rutten et al., (2010) Forum Theatre Intervention	• Small but positive changes were found in moral atmosphere, but not in moral reasoning or fair play attitude • On-field antisocial behavior decreased significantly one month after the intervention • Off-field antisocial behavior and both on- and off-field prosocial behavior did not show a significant change
	Gano-Overway (2013) Physical Education Program	• A perceived caring climate positively predicted prosocial behavior and cognitive empathy and negatively predicted antisocial behavior • Cognitive empathy mediated between a caring climate and prosocial behavior
Experimental	Busch et al., (2013) The Utrecht Health School (UHS)	• Results indicated significant reduction in bullying and victimization behaviors in the intervention group when compared to the control group
	Carraro et al., (2014) Play Fighting Intervention	• Lower self-reported aggressive behavior was found among students who received the play fighting lessons which facilitated the control over aggressive behavior and helped students manage and control their physical strength
	Beets et al., (2009) Positive Action Program	• Students who received the intervention reported significant lower levels of bullying behavior when compared to their control group • A dose-response relationship was found and showed that students with an increased level of exposure to this intervention had more reduction in negative behaviors
	Li et al., (2011) Positive Action Program	• Intervention was implemented in Chicago for two years and found a significant reduction in bullying behavior • A dose-response relationship was not found in this particular intervention

Table 5. Summary of quasi-experimental studies results and Pearson's correlation coefficient effect size for all bullying outcomes

Main Study		Unadjusted model correlation coefficient	Unadjusted model 95% CI	Adjusted model correlation coefficient; variable	Adjusted model 95% CI
Gano-Overway et al., (2009) National Youth Sport Program (NYSP)	Bullying outcome	-0.24	(-0.33, -0.15)	-0.06; Empathic Self-Efficacy	(-0.15, 0.03)
	Prosocial bystander outcome	0.37	(0.28, 0.45)	-0.05; Empathic Self-Efficacy	(-0.14, 0.04)
Rutten et al., (2010) Forum Theatre Intervention	Bullying outcome	-0.14	(-0.33, 0.06)	None	None
	Prosocial bystander outcome	0	None	None	None
Gano-Overway, (2013) Physical Education Program		-0.22	(-0.30, -0.14)	-0.32; Affective Empathy	(-0.39, -0.24)

Note. CI: Confidence Interval

Table 6. Summary of experimental studies results and standardized mean difference effect size for all bullying outcomes

Main Study		Odds Ratios	95% CI	90% CI	Standardized Mean Difference
Busch et al., (2013) The Utrecht Health School (UHS)	Bullying outcome	0.38	(0.23, 0.65)	None	-0.53
	Victimization outcome	0.38	(0.07, 0.63)	None	-0.53
Carraro et al., (2014) Play Fighting Intervention		None	None	None	Physical= -0.61 Verbal= -0.67
Beets et al., (2009) Positive Action Program	Student report	0.29	None	(0.16, 0.52)	-0.68
	Teacher report	0.61	None	(0.38. 0.97)	-0.27

Note. CI: Confidence Interval

Table 7. Risk of bias of individual studies using the Cochrane Collaboration's Tool for Risk of Bias assessment (Higgins et al., 2016)

Main Study	Selection Bias	Information Measurement Bias	Blinding of Outcome Assessors (Detection Bias)	Incomplete Outcome Data (Attrition Bias)	Selective Outcome Reporting	Failure to Control Confounding
Gano-Overway et al., (2009)	High	Low	Unclear	High	Low	Unclear
Rutten et al., (2010)	High	Low	Unclear	High	Low	Low
Gano-Overway, (2013)	High	Low	Unclear	High	Low	Unclear
Busch et al., (2013)	High	Low	Unclear	High	Low	Low
Carraro et al., (2014)	Low	Low	Unclear	High	Low	Unclear
Beets et al., (2009)	Low	Low	Unclear	Low	Low	Low
Li et al. (2011)	Low	Low	Unclear	Low	Low	Low

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