

THE EFFECTS OF PHYSICAL EDUCATION ON SOCIAL OUTCOMES IN
CHILDREN WITH DISABILITIES: A META-ANALYSIS

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ABSTRACT

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Social outcomes are the foundation of human relationships and many children with disabilities may display deficits in the necessary behaviors to form those connections. Previous literature shows that physical activity can be an effective intervention for children with disabilities to promote social outcomes through the three domains of learning – cognitive, psychomotor, and affective. The purpose of this meta-analysis is to collect, index, and evaluate the available literature exploring how a physical education program can impact social outcomes in children with disabilities. By composing articles pertaining to social outcomes and physical education through multiple databases, researchers will be able to view a comprehensive literature review of studies completed.

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INTRODUCTION

Social outcomes are the cornerstone of human consciousness as it allows for individuals to participate within communities and develop lasting relationships with others (Beauchamp & Anderson, 2010; Cacioppo, 2002). When social outcomes are not developed, individuals struggle to communicate and research has found several health consequences that include feeling isolated, lonely, and disconnected in distinct personal and professional settings (Hawkey & Cacioppo, 2013). Individuals with social/emotional disabilities may struggle more with developing the necessary social outcomes to produce positive relationships and health outcomes (United States Department of Education, 2021). Many children with disabilities exhibit deficits in social outcomes and verbal expression due to difficulty with nonverbal interactions (Frye, 2018; Kavale & Forness, 1996; Reiff). There are several methods/techniques/strategies that have been used to enhance social outcomes (Reichow & Volkmar, 2010; Spence, 2003). One of the promising methods in school settings to promote social outcomes has been incorporating interaction through physical activity (Bartolomeo & Papa, 2019; Goudas & Magotsiou, 2009; Opstoel et al., 2020). Given the increase of children with disabilities engaging in sedentary behaviors, physical activity may provide a multiplicative effect through the benefits from both activity and social interaction (Hsieh et al., 2017; Must et al., 2014). School environments (e.g., physical education) provides planned and unplanned social learning opportunities for children, including those with disabilities (Office of Special Education Programs). The Centers for Disease Control and Prevention (CDC, 2022)

reported 91% of k-12 schools require physical education as part of the individualized education program document for children with disabilities, despite this requirement, 52% of schools exempted students with cognitive disabilities from those physical education requirements (CDC, 2022).

Physical education provides instruction and support for students to develop motor skills, knowledge, and behaviors for physical activity, physical fitness, and physical literacy thus assisting in students' confidence and ability for life-long physical activity (California Department of Education, 2010; CDC, 2022; Society of Health and Physical Educators [SHAPE], 2015). The National Standards for Physical Education explains the goal of physical education is to develop physically literate individuals by gaining the knowledge, skills, and confidence to enjoy a lifetime of physical activity (SHAPE, 2015). Mandigo et al. (2009) includes social skills within their definition of physical literacy by adding that physically literate individuals are able to assist others in acquiring these skills. By being physically literate, students will be able to assess the active environment around them and react appropriately to the events and situations (Higgs et al., 2008). To achieve student learning, physical education standards have been developed to provide direction and guidance for three domains that includes affective, cognitive, and psychomotor outcomes (Hansen, 2008; SHAPE America, 2014). Cognitive aspects for learning are related to the knowledge of movement and fitness, psychomotor skills involve movement literacy that support engagement in lifetime physical activity, and the affective domain addresses the growth and development of emotional and social skills (SHAPE America, 2014). Brett et al. (2003) defines the affective domain as referring to

the emotions and their expressions that contribute to healthy intrapersonal or interpersonal interactions which can be applied within physical activity contexts.

Although the physical education definition given by the CDC (2022) does not include mention of emotions and its expression within their definition, it is important to include and teach social outcomes within physical education as educators should not presume that students will learn these skills inherently (Hellison, 2011; Madrona et al., 2016; Samalot-Rivera & Porretta, 2012; Vidoni & Ward, 2009). Physical activity can be broadly defined and includes a variety of different movements that can be performed with others or by one's self (Piggin, 2020). Research has found that the majority of activities that adults choose to engage in for recreational or health involve social contexts (Department of Health and Human Services, 2018; National Institute on Aging, 2022). School-based physical education provides opportunities for students to develop foundational social outcomes that will allow for healthy social interactions in physical activity settings (CDC, 2022; Opstoel et al., 2020).

Social Skills, Social Competence, Social Behavior, Social Interactions

Social behaviors are defined as more general interactions and acts relating to the social domain rather than specific skills such as manners or responding to greetings (Ledford & Pustejovsky, 2021). Social behaviors influence social skills, though having competent social skills does not necessarily result in skilled social interactions (Romanczyk et al., 2005). Research has found that for individuals to lead a more fulfilled life in quality and quantity, social interactions are needed (Salavera & Usan, 2021);

however, when social skills are not fully developed the behaviors and competence related to meaningful interactions is decreased (Hukkelber et al., 2019; Vahedi et al., 2012).

Ahmed (2021) defines social skills as relating to the personal advantages and the methods of communication an individual engages in as there is an interaction of intrapersonal and interpersonal skill sets that allow for healthy interactions to take place. McClelland and Morrison (2003) explain that social skills can also affect learning and performance within students (Liu, et al., 2010). Swanson and Williams (1992) expand on this by defining social skills as cognitive functions that are performed when interacting with others to present explicit behaviors competently on a social task. When social outcomes are lacking in individuals, they can lead to adverse effects by inhibiting the foundation for social, cognitive, and language development (Carmago, et al., 2014). For example, to engage in conflict resolution, individuals need to process (in real time) the use of the correct word(s), at the correct time(s), in the correct manner to navigate such a difficult social situation (Lederach, 2003). Understanding social behaviors and social skills and how they interact with one another, whether positive or negative, leads to social competence (Hukkelberg et al., 2019). Studies have found that social competence in children is the ability to appropriately and fortuitously achieve their interpersonal goals (Guralnick, 1990; Han & Kemple, 2006). Physical education can be a segway to achieve students' interpersonal goals and therefore assist in social competence (Fitzpatrick & Pope, 2005).

Physical Activity, Exercise, Fitness, Physical Exercise, and Physical Education

Structured physical activity programs focusing on fundamental motor skills can provide students with opportunities to explore and practice social outcomes through social skill related activities (Bo et al., 2019). However, Johnson and Turner (2016) argue that any physical activity – before, during, or after school, as well as physical education, recess, sports, and clubs – can provide students with social opportunities. These opportunities are embedded in many standards at the state and federal level. At the state level, the California Department of Education (2021) embedded Transformative Social and Emotional Learning within their education system to facilitate the understanding of social outcomes that can be brought into other aspects of school. Within the California State Standards for Physical Education adopted by the California State Board of Education in 2005, social interaction is included within all k-12 grades. At the federal level, Standard 4 and 5 of the SHAPE (2013) curriculum states that the physically literate individual displays responsible personal and social behavior including an understanding of the value physical activity has in social interaction. The largest of the five professional organizations within SHAPE, The National Association for Sport and Physical Education (2012), affirms that the standards within their framework directly correlate with the Social Emotional Learning framework as they require students to exhibit social behaviors that display respect to themselves and others as well as understand the value in physical activity as a means for social interaction (Jacobs & Wright). Curriculum used either at the state or federal level is used in education in classrooms and teaching programs across the country.

Education, Classroom, School, Learning, Teaching

Education is needed to keep society functioning as human development and socialization are important for a cohesive community (Laevers, 1994). This idea of education can be translated into many forms; however, it is essential the form fits the developing child (Laevers, 1994). Education in the formal sense involves a systematic, organized model regulated by laws and norms offering an unvarying curriculum containing objectives and methodology (Dib, 1988). An alternative definition given by Melnic and Botez (2014) provides a more in-depth explanation: education is a systematic way to establish an individual from an intellectual, psychic, physic, affective, and socio-professional standpoint. This definition given by Melnic and Botez (2014) is comparative to the whole-child approach in education. Salde and Griffith (2013) define the whole-child approach as a focus on the social, emotional, mental, and physical well-being of a child as well as emphasizing their cognitive development. The whole-child approach seeks to establish a connection between the physical and emotional well-being of a student in relation to learning by ensuring each student learns about and practices a healthy lifestyle (Lewallen et al., 2015). Physical activity is the bridge between the physical and emotional well-being of a student and learning (CDC, 2022). The effects of physical activity on learning involving cognitive function are evident throughout all the systems within our body – at the molecular, cellular, and behavioral levels (Hillman et al., 2008). However, the brain cannot differentiate between just cognitive functioning and the motor functioning seen in physical activity (Diamond, 2000). The brain associates all

functioning – cognitive, motor, emotional, and social – into learning as a whole (Diamond, 2000). Therefore, it is important that physical education is included within the learning process as it does not just help with cognition, but social aspects as well (Kohl III & Cook, 2013).

Given that physical education fosters social outcomes in all children, including those with disabilities, and there are more than half (52%) of students with disabilities being excluded from physical education, it is imperative to understand the literature and have the ability to present a case for the inclusion of physical education for students with disabilities. Therefore, the purpose of this meta-analysis is to synthesize the literature exploring how a physical education program can impact social skill outcomes in children with disabilities.

METHODS

Search Strategy

The following keywords were used to identify potential articles: Physical activity, exercise, fitness, physical exercise, social skills, social competence, social behaviors, social interaction, education, classroom, school, learning, and teaching. Keyword combinations were entered into the following databases: Child Development & Adolescent Studies, CINAHL Complete, ERIC, SPORTDiscus, PsycINFO, PsycARTICLES, ProQuest. The overall search strategy included using combinations of keywords from “activity” and “social skills” categories and when needed context (“education”). Searches were conducted between January 1970 and December 2022. To ensure a comprehensive approach was used, the authors conducted manual searches of reference lists for articles meeting inclusion criteria to identify any missing literature. The search process was conducted in three phases that included (i) screening the titles; (ii) screening the abstracts; and (iii) retrieving the full article and screening to determine if the article met the inclusion criteria. When questions concerning the inclusion status of articles arose, the final decision was reached by consensus between the two authors.

Inclusion Criteria

Included studies met the following criteria (a) Study was conducted within a physical education or physical activity context; (b) Study was conducted with children

ages 3-22 diagnosed with a disability; (c) Study reported on social outcome(s) measuring social interactions between peers; (d) Study reported quantitative descriptive statistics to estimate an effect size; (e) Study was written in the English language between 1970 and December 2022.

Data Extraction

Data extraction was completed by one reviewer, with a second reviewer examining 30% of randomly selected articles for accuracy. No errors were found concerning data extraction by the second reviewer. Data was extracted into an electronic database including: author; date of publication; country of origin; study design; participant details; context of study (classroom, physical education setting, recess); measure of social skills observed; other relevant outcomes/correlates; measures of other relevant outcomes/correlates used; length of follow-up (if applicable); control group used (if applicable); statistical analyses used; statistical measures of the relationship between social outcomes and other outcomes/correlates; covariates (if any); and comments on overall quality of the study. Studies were grouped in accordance to this information for the justification of meta-analyses, including outcome/correlates, participant age, and study context.

Publication Bias, Outliers, Study Quality

Outliers were screened by reviewing residual values (z-scores) that are produced from Comprehensive Meta-Analysis 4.0 software (Borenstein et al. 2021). Studies were

considered to be outliers if the residual score was ± 1.96 standard deviations above or below the mean effect size. A “one study removed” (sensitivity analysis) was performed to determine the overall result if a study(ies) were removed. Outliers were retained if results were unchanged ($P < 0.05$) and within the 95% Confidence Interval. Publication Bias was assessed using four methods that included the use of funnel plots, a trim and fill procedure, and analyses that considered the contributions of smaller studies to overall effect Begg & Mazumdar’s Rank Order Analysis and Egger’s Regression Intercept (Begg & Mazumdar, 1994; Egger et al., 1997). The Risk of Bias (ROB) v2.0 tool was used to evaluate study quality and risk of bias analyses. Three independent reviewers coded and rated studies in accordance to specific characteristics (see ROB v. 2.0). Independent assessments will be compared for agreement after all studies meeting inclusion criteria have been collated. Disagreements will be analyzed to assess the type of error and to categorize the error as disputes concerning text (document errors) or analytical errors (vague interpretation of information).

Random Effects Model

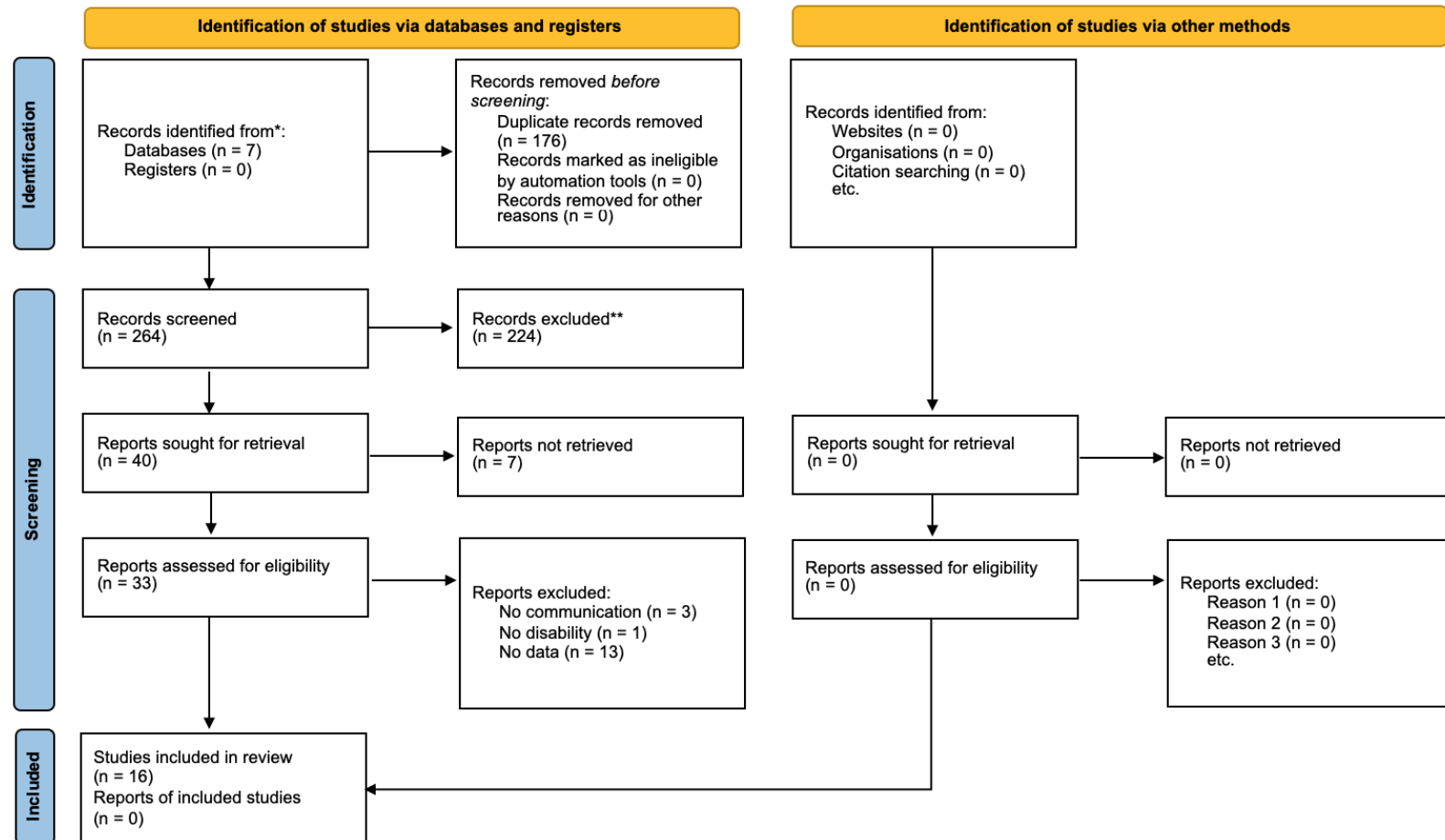
A random effects model was chosen to interpret findings and apply authentic data (Field, 2001, 2003; Hunter & Schmidt, 2000). A random effects model assumes that heterogeneity comes from sampling error and between study variance (Borenstein et al., 2010; Hunter & Schmidt, 2000). To adjust and model for factors associated with modeling error, a random effects model adjusts effect sizes by the inverse weight of the variance incorporating sampling and between-study error (Borenstein et al., 2009)

Heterogeneity of Variance

With use of a random effects model, it is assumed that the true effect size will vary between studies. To counteract this, three measures were used to assess heterogeneity: Q_{Total} (Q_T), tau-squared (τ^2); I -squared (I^2) values. The Q_T value presents as a significant test based on critical values for a chi-square (χ^2) distribution and determines overall heterogeneity. To determine subgroup differences, statistical techniques (i.e., t -test or analysis of variance, ANOVA) are used (Borenstein et al., 2009; Hedges & Olkin, 1985). The tau-squared (τ^2) value is an approximation of the total variance between studies and provides a calculation of the study weight. A pooled estimate of variance was used for all calculations as small sample sizes may impact the precision of tau-squared (τ^2) (Borenstein et al., 2009). The I -squared (I^2) value supplies the estimated overlap of confidence intervals and is interpreted as having low overlap (25%), moderate overlap (50%), and high overlap (75%) of the total variance given to covariates (Higgins et al., 2003).

RESULTS

The primary purpose of the current meta-analysis was to determine the effectiveness of structured physical activity programs on social domain outcomes (social competence, social engagement, social interaction, and social skills) for children with disabilities. There were 16 studies that met the inclusion criteria involving 472 children from seven countries (Canada, China, Czech Republic, Iran, Taiwan, Turkey, and the USA). Autism Spectrum Disorder and Intellectual Disability were the most frequent disabilities researched with the majority of samples involving both male and female. More than half the studies used a within-subjects design and were conducted in school-based settings with time periods ranging in time from 2 days to 10 months. Figure 1 presents the search strategies and article screening process used to determine the final sample of included studies. Table 1 provides the coding information for the methodological, participant, and study characteristics that were extracted from each paper. Cohen's (1988) criteria was used evaluate the outcome effects with the use of standardized mean differences (Hedge's g) to summarize the effect sizes as small (≥ 0.20), moderate (≥ 0.50), and large (≥ 0.80).



*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers).

**If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools.

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: 10.1136/bmj.n71. For more information, visit: <http://www.prisma-statement.org/>

Figure 1. PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers

Table 1. Social characteristics of included studies

Study	Methodological Characteristics					Sample Characteristics			Study Characteristics			
	Design	Train	Focus	Time	Setting	Disability	Gender	Country	N	Measure	Fund	Status
Bluehardt, 1994	B	N	G	10w	S	SLD/LANG	B	Canada	45	C	U	U
Bluehardt & Shephard, 1995	B	N	T	10w	S	SLD	B	Canada	45	C	U	P
Cavanaugh, 2010	W	N	G	2d	C	ASD	B	USA	11	C	U	U
Choi & Cheung, 2016	B	D/N	G	8w	S	ID	B	China	30	O	U	P
Cross, 2011	W	PE/D	T/G	10w	S	MULTI	B	Canada	16	C	U	U
Francová, 2014	W	N	T/G	10m	S	ID	B	Czech Rep.	30	C	U	P
Haghighi, 2022	B	N	G/E	8w	T	ASD	B	Iran	16	C	U	P
Karakaş et al., 2016	B	D	E/G	NR	S/C	ASD	B	Turkey	36	O	U	P
Kopczuk, 1976	B	N	G	8w	S	MULTI	B	USA	22	S	U	U
Memari et al., 2017	W	N	E	7d	S	ASD	B	Iran	68	O	U	P
Oriel et al., 2008	W	PE/D	T/G	8w	C	P/C	B	USA	18	C	U	P
Oriel et al., 2020	W	PE/D	G	8w	C	ASD	B	USA	13	C	U	P
Pan, 2010	W	PE	T/G	10w	C	ASD	M	Taiwan	16	O	U	P
Wickiser, 2002	B	D	T/G	9m	C	ID	B	USA	35	O	U	U
Wickiser, 2005	W	D	T/G	9m	C	ID	B	USA	30	O	U	U
Zhao & Chen, 2018	W	PE	T/G	12w	S	ASD	B	China	41	C	U	P

Note. Design = Research Design. B = Between Group Comparison or W = Within Group Comparison; Train = Instructor Training. PE = Physical Education Training, D = Disability Training, or N = No Social Domain Training. Focus = Type of Program. G = Games, E = Exercise, or T = Technique; Time = Duration of Program. D = Days; W = Weeks; M = Months. Setting = Setting of Program. S = School, C= Community, or T = Therapeutic; Disability = Disability Type. ASD = Autism Spectrum Disorder, C = Cognitive, ID = Intellectual, LANG = Language, MULTI = Multiple, P = Physical, SLD = Specific Learning Disability; Gender = Sample Gender. M = Male Only, B = Both Male and Female; Country = Study Location; N = Sample Size. Measure = Outcome Measures; O = Objective Measures Used, S = Subjective Measures Used, C = Both Objective and Subjective Measures Used. Funding = Funding Status; F = Funded and U = Unfunded. Status = Publication Status; P = Published and U = Unpublished. NR = Not Reported

Outliers and Publication Bias

Outliers were identified through the individual study residuals scores and two studies exceeded the threshold ($z \geq 1.96$) and included Francova 2019 ($z = -2.76$) and Wickiser 2002 ($z = 3.03$). A one study removed procedure (sensitivity analysis) was conducted in CMA v4 to determine the final status for each of the studies identified as outliers. Results from the “sensitivity analysis” determined that the outliers balanced the distribution either reducing ($g = 0.05$) or increasing ($g = 0.07$) the overall estimate of effect ($k = 16, g = 0.22, P = 0.047$). Removing the study with a negative residual value would have negated the overall findings, however, given then distribution of studies and the overall study sample size both studies were retained.

Publication bias was evaluated using a visual inspection of a Funnel Plot, a Trim and Fill procedure, Begg & Mazumdar’s Rank Order Analysis (Begg & Mazumdar, 1994), and Egger’s Regression Intercept (Egger et al. 1997). Figure 2 represents the funnel plot with the Trim and Fill procedure that did not add studies on the left side of the mean effect ($g = 0.22, 95\% CI = 0.13, 0.34, P = 0.047$) remaining small. Both Begg and Mazumdar’s Rank Order analysis ($P = 0.28$) and Egger’s Regression Intercept ($P = 0.41$) were not significant suggesting the smaller size studies did not make significant contributions to the overall results. However, we cannot rule out the absence of publication bias with these findings given the overall study sample size ($k = 16$).

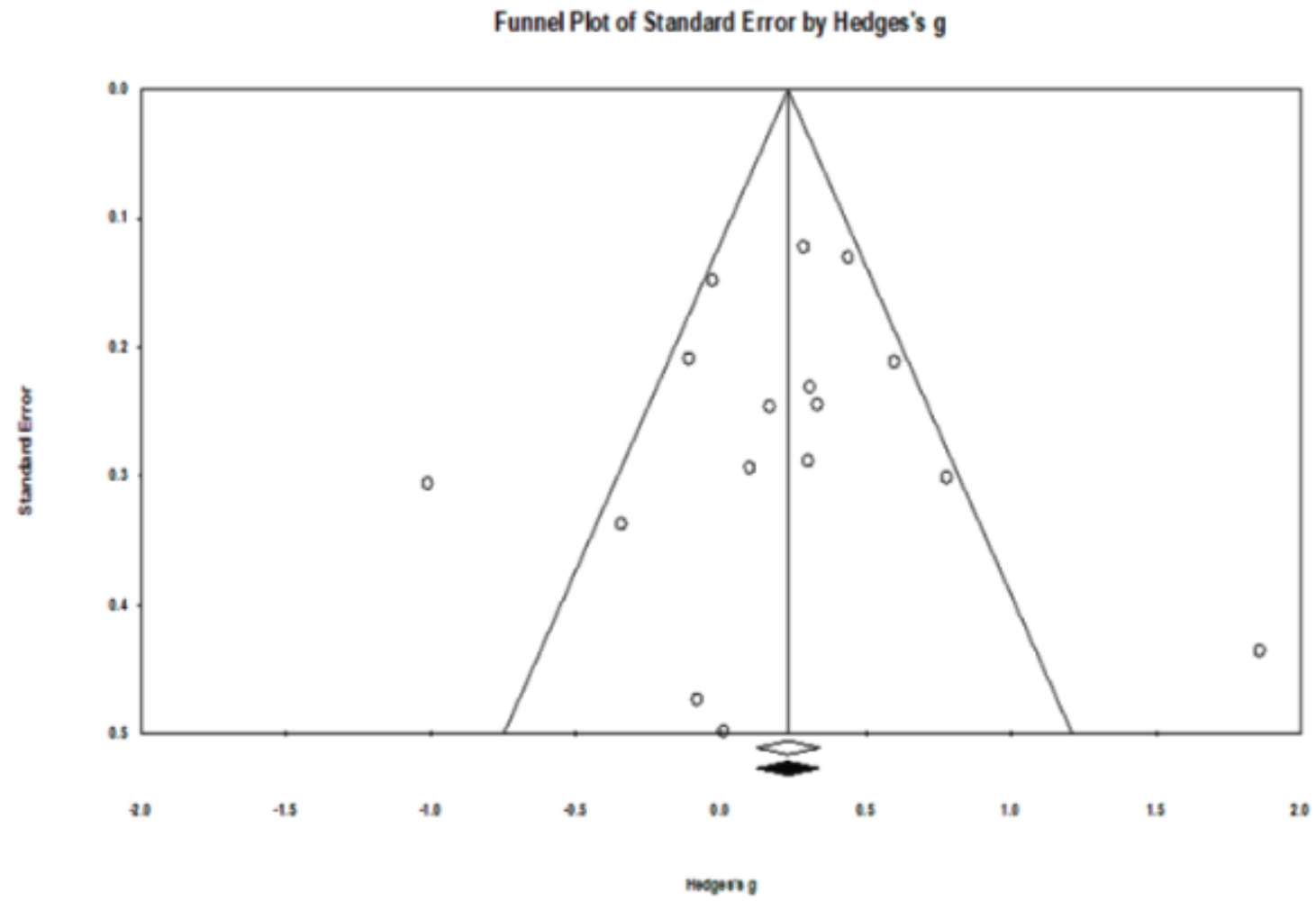


Figure 2. Funnel plot of included studies

Random Effects Model

Across all social domain outcomes (social behaviors, social competence, social interaction, and social skills) there was a small positive effect ($g = 0.22$, 95% $CI = 0.13, 0.34$, $P = 0.047$), however, based on the different definitions and constructs for each social domain a critical number of studies was not available to report results. Meta-Analysis guidelines recommend that there is a minimum of 10 studies needed to ensure a stable estimation of an overall summary effect size (Borenstein, 2009). All individual variables for each social domain had fewer than 10 studies, therefore, the author has selected to report effect sizes for each construct for descriptive purposes to provide discussion and recommendations. Effect sizes ranged from minimal to moderate and only four outcomes had enough studies to generate prediction intervals and all heterogeneity statistics are indicative of mixed results.

Table 2. Social domain outcomes

Variable	Effect Size Statistics					Null Test		Heterogeneity Statistics			
	<i>k</i>	<i>g</i>	<i>SE</i>	<i>s</i> ²	<i>CI</i>	<i>Z</i>	<i>P</i>	<i>PI</i>	<i>Q</i>	<i>τ</i> ²	<i>I</i> ²
Social Skills											
Empathy	2	-0.11	0.33	0.11	-0.76, 0.54	-0.33	0.74		2.25	0.12	55.63
Social Skills	5	0.53	0.16	0.03	0.21, 0.85	3.26	0.00	-0.53, 1.58	13.47	0.08	70.30
Social Competence											
Social Acceptance	2	-0.01	0.17	0.03	-0.34, 0.33	-0.03	0.97		0.73	0.00	0.00
Hostility	3	0.11	0.15	0.02	-0.19, 0.41	0.76	0.47		1.22	0.00	0.00
Social Behaviors											
Adjustment	5	0.03	0.14	0.02	-0.24, 0.31	0.25	0.81	-0.73, 0.80	6.43	0.04	37.83
Self-Manage	2	0.11	0.26	0.07	-0.40, 0.63	0.43	0.67		2.61	0.08	61.68
Social Interactions											
Cooperation	6	0.11	0.22	0.05	-0.32, 0.55	0.51	0.61	-1.29, 1.52	17.67	0.21	71.70
Communication	6	-0.08	0.21	0.04	-0.48, 0.33	-0.37	0.71	-1.28, 1.13	13.14	0.15	61.95
Adaptive Skills	2	-0.23	0.76	0.59	-1.72, 1.27	-0.30	0.77		18.22	1.10	94.51
Assertion	3	0.29	0.15	0.02	-0.01, 0.58	1.92	0.05		1.65	0.00	0.00

Note. *k* = number of studies, Hedges *g* = effect size, *s*² = variance, *SE* = Standard Error, 95% *CI* = Confidence Interval (Lower Limit, Upper Limit), *Z* = Null Hypothesis Test; *PI* = Prediction Interval (lower limit, upper limit), *τ*² = Between Study Variance, * *p* < 0.05.

DISCUSSION

There was a small summary effect size ($g = 0.22$) for all social domain outcomes (social skills, social competence, social behaviors, social interactions), however, no conclusions could be inferred for individual outcomes (see Table 2). The physical education literature has established standards for student learning and the affective domain at state and national levels which includes specific variables linked to social skills, social competence, social behaviors, and social interactions (Brett et al., 2003; California Department of Education, 2018; Jacobs & Wright; Kohl & Cook, 2013; SHAPE, 2013). Given the small number of students and small effect size, more evidence is needed to determine how social domain outcomes that have similar, as well as differing constructs, are developed and improved within movement contexts. The overall findings were difficult to summarize as the operational definitions between social domain outcomes differed between studies. To address these differences, the current investigation has focused on the study characteristics from Table 1 that would facilitate future research and allow for generalizations to connect activity contexts to the acquisition of social domain skills.

Methodological Characteristics

The methodological characteristics that were noteworthy for studies included in the current investigation were research designs employed by studies, time periods that studies were conducted, and the sample sizes associated with studies meeting inclusion

criteria. Research designs provide frameworks to analyze, interpret, and form conclusions and make recommendations concerning future research (Thomas et al., 2023). Studies included in the current investigation included either within group ($k = 9$) or between group ($k = 7$) designs, however, none of the studies employed a true experimental design. The study periods ranged from two days to 10 months and while the findings from each study contributed to the literature, social domain outcomes are developmental processes that require longitudinal perspectives that track change over time in children (Kuhn et al., 1995; Malik & Marwaha, 2022; Soto-Icaza et al., 2015). The smallest sample size involved 11 subjects while the largest sample size included 68 participants with different studies evaluating social domain outcomes for different disabilities and characteristics. The literature on research methodology states that in order to draw conclusions and make inferences about how treatment effects influence an outcome(s), randomized experimental designs using power analyses are needed to determine overall effects (Thomas et al., 2023). When conducting research on children and adolescents with disabilities, the development of social domain outcomes is critical to their success across a number of contexts (Allen & Kelly, 2015; Shonkoff, 2000; United States Department of Education, 2021). While some of the study time periods might have been long enough to develop social domain outcomes, the lack of information regarding specific constructs and how outcomes would be developed within each social domain outcome were problematic. Research has found when attempting to change developmental outcomes in children with disabilities, specificity and tracking measures are needed to report progress (The IRIS Center, 2019). Future research studying how physical activity contexts

influence social outcomes would benefit from defining social domain characteristics, employing experimental research designs with adequate power, and using longer time periods to measure and track development of social domain outcomes.

Contextual Factors

Contextual factors in which studies were conducted may also influence the overall results related to the development of social domain outcomes in children with disabilities. Specific contextual factors that were present and may have influenced study findings were the training and qualification of the instructors providing the social domain lessons, the activity focus and learning requirements of the activities, and the setting in which the activities took place. The training of the instructors varied from only physical education training ($k = 2$), only disability training ($k = 3$), both physical education and disability training ($k = 3$), no social domain training ($k = 7$), and both no social domain training and disability training ($k = 1$). Research has found that when instructor skills and knowledge do not align with the learning expectations, children may or may not acquire the expected outcomes (Allen & Kelly, 2015; Darling-Hammond et al., 2019; Greenhill, 2010). Instructors delivering the social domain experiences had the necessary knowledge related to exercise or disability, however, little or no information was provided on their knowledge of how to develop social domain outcomes. Furthermore, the specific social domain learning outcomes were ambiguous making it difficult to interpret how the children were to acquire each of the specific domain skills being taught. When social domain outcomes are connected to specific lesson activities, learning and development

are easily tracked and improved (Darling-Hammond, 1995; Mercier & Doolittle, 2013). Future research should provide more details on social domain outcomes, specific lessons and assessments that outline how children will develop these social domain outcomes, and provide information related to how instructors were trained to deliver social domain outcomes.

Physical activity environments provide opportunities to engage and learn social domain outcomes, however, activities need to be implemented and supervised in a thoughtful and deliberate manner (Allen & Kelly, 2015; Ho & Funk, 2018). The focus of lesson activities within the studies included games, exercise/activity technique, and/or exercise within an activity setting which was at school, within the community, or in a therapeutic facility. Examples of a few activities in studies for each of the categories included soccer (games), swim skill instruction (activity/technique), and resistance band exercises (exercise). Studies included in the analysis provided information on the types of activities, however, vague information was included about the types, frequency, and quality of the social interactions that would occur during the different activities. Furthermore, each of the different contexts in which activities were delivered may have also influenced the development of social domain outcomes given the purpose specific to each context. For example, school-based environments have structured learning experiences with expected learning outcomes as compared to community-based experiences that may focus on fun and general skill development or therapeutic environments in which rehabilitation outcomes are the priority. Although each study included specific physical activities with planned opportunities for social domain

outcome development, research has found that when there is a lack of connection between outcomes and the activity, expected learning may (or may not) occur (Deslauriers et al., 2019; Gray & DiLoreto, 2016).

In order for students to demonstrate success related to a learning objective, explicit instruction has to be present and connected to the types of activities that individuals are participating in (Archer & Hughes, 2011; Hall & Vue, 2004). The training for the instructors in these settings differs and social domain outcomes may or may not be a priority. Information on how instructors delivered the social domain information to the students was not reported or was likely ineffective, therefore, students were unable to demonstrate or acquire the social knowledge and/or skills during the activity. Future research might consider making connections between the activities within the setting and describe how social activity will occur as well as what student learning will look like if they were successful. Due to the vagueness of the constructs regarding differing social domains, children with disabilities were unsuccessful in their social domain learning. Future research would benefit from adequate training of the instructors to ensure target learning for students is met (Yoon et al., 2007; Grey et al., 2005).

Participant Characteristics

The characteristics of the participants may have impacted the quality of the results as participants' disability, gender, and their location can affect the learning of social domain outcomes. Each disability has its own set of characteristics and much research has been conducted to learn what practices work best for individuals with certain

disabilities (Beech, 2010; Individuals with Disabilities Education Act, 2004). Therefore, each activity needs to be developmentally appropriate for the individuals by considering and implementing progressions that allow for differences in social level of functioning (Allen & Kelly, 2015; Bredekamp et al., 2022). Due to the lack of social domain training given to the instructors of participants, they were unable to provide the participants with the specific instruction on how to acquire social skills based on the characteristics of that disability. Researchers and instructors need to make adjustments within the activities and lessons being given to the students with disabilities based on the students' characteristics and their baseline social functioning level (Lembke et al., 2018; McLeskey et al., 2017). For example, there are differing evidence-based practices to develop social domain outcomes that are used when working with a student with Autism Spectrum Disorder versus working with a student with Intellectual Disability (Jacob et al., 2022; The IRIS Center, 2016). Future research being conducted on social domain outcomes in students with disabilities should recognize these differences to better provide training to the instructors working with the students with disabilities (Allam et al., 2021, United States Department of Education, 2021).

Participants' gender and their location may also affect the learning of social domains as social norms surrounding gender may differ based on cultural perspectives (Jhangiani & Tarry, 2022). The social norms and expectations of children may be different depending on the cultural perspectives as research suggests that children's achievement and outcomes may differ based on these factors (Breiner et al., 2016). In the current investigation, seven different countries attempted to improve social domain

outcomes in children with disabilities, however, only three studies provided disaggregated data on gender and none of the studies provided a cultural lens to interpret data. Gender and cultural social norms may affect children's outcomes and reporting and disaggregating outcomes according to those variables will improve the development of social domain outcomes in physical activity settings (Spencer et al., 2015, *The Lancet Public Health*, 2019).

CONCLUSIONS

When analyzing the previous literature on physical education and its effects on social outcomes in children with disabilities, signs point to its significance. However, there are inconsistencies between what the literature tells us and the results found within those studies; overall, there is not enough data to draw any conclusions concerning the effect physical education has on social domain outcomes. The lack of results can be attributed to the lack of information on important social characteristics needed to develop social domain outcomes through physical education in children with disabilities. More evidence in the form of study constructs is needed to provide adequate information in how results were reached. Future research would benefit from providing additional information on the methodological characteristics, such as operational definitions, the contextual factors, such as the type of social domain training the instructors received, and the participant characteristics, such as how the researcher is differentiating activities and lessons for students with varying disabilities and developmental levels.

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