







Children and youth with impairments in social skills and cognition in out-of-school time inclusive physical activity programs: a scoping review

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Children and youth with impairments in social skills and/or cognition face many barriers to community participation specifically physical activity (PA) (e.g., limited staff training). Inclusive PA settings may provide opportunities for children and youth with and without impairments to engage together and promote physical and social skill development. The purpose of this scoping review was to critically evaluate the literature on out-of-school PA programs (i.e., non-curriculum programming) that included children and/or youth with impairments in social skills and/or cognition. A keyword search of seven databases followed by eligibility screening led to ten articles for this scoping review. For each included study, two research team members independently extracted and synthesized the data, and appraised the study reporting quality using the published quality assessment tool (QATSDD). Experts' evaluation of the research literature was obtained. Ten studies, which varied from low to high reporting quality, collectively addressed the following outcomes, with all showing mixed impacts: anthropometrics and fitness; motor and sport skills; psychological well-being; and socialization. Experts suggested routes forward for research and practice including longitudinal designs and programming variety to meet individual needs. Out-of-school PA programs that include children and/or youth with impairments in social skills and/or cognition provide an opportunity to improve multiple areas of health and wellness. However, limited high-quality research has been conducted to-date. Further evaluation of program effectiveness is warranted.

Keywords: Inclusion, physical activity, participation, recreation

Inclusion is a key component of human rights for children and youth (United Nations 2015). Specifically, UNESCO (2018) outlines that “inclusion” is having access to, physical presence at, participating in, and achieving appropriate outcomes for the setting (e.g., academic or recreational program). Inclusive physical activity (PA) programming can incorporate socialization opportunities with physical skills development activities for the participants (Martin 2010). In such programs, the intention is that individuals with diverse abilities participate meaningfully together, through the provision of individualized support and adaptations to existing curricula, to enable an environment that fosters full participation (defined herein as “inclusive”; DePauw and

Doll-Tepper 2000, Goodwin and Watkinson 2000, Grenier 2011, UNESCO 2018). Though conceptually appealing and an oft-stated goal, it is challenging (and rarely accomplished) to create PA programs that embody inclusion at the core of the curriculum and child autonomy within the program (Arbour-Nicitopoulos *et al.* 2018a).

Within physical education, inclusive practices are associated with a variety of benefits for students with all types of disabilities (e.g., enhanced psychosocial well-being), students without disabilities (e.g., greater acceptance), and physical education teachers (e.g., increased competence working with individuals of diverse abilities; Kalyvas and Reid 2003, Obrusniková *et al.* 2003, Seymour *et al.* 2009). However, including all children and youth with disabilities in a physical education curriculum can be challenging. For example,

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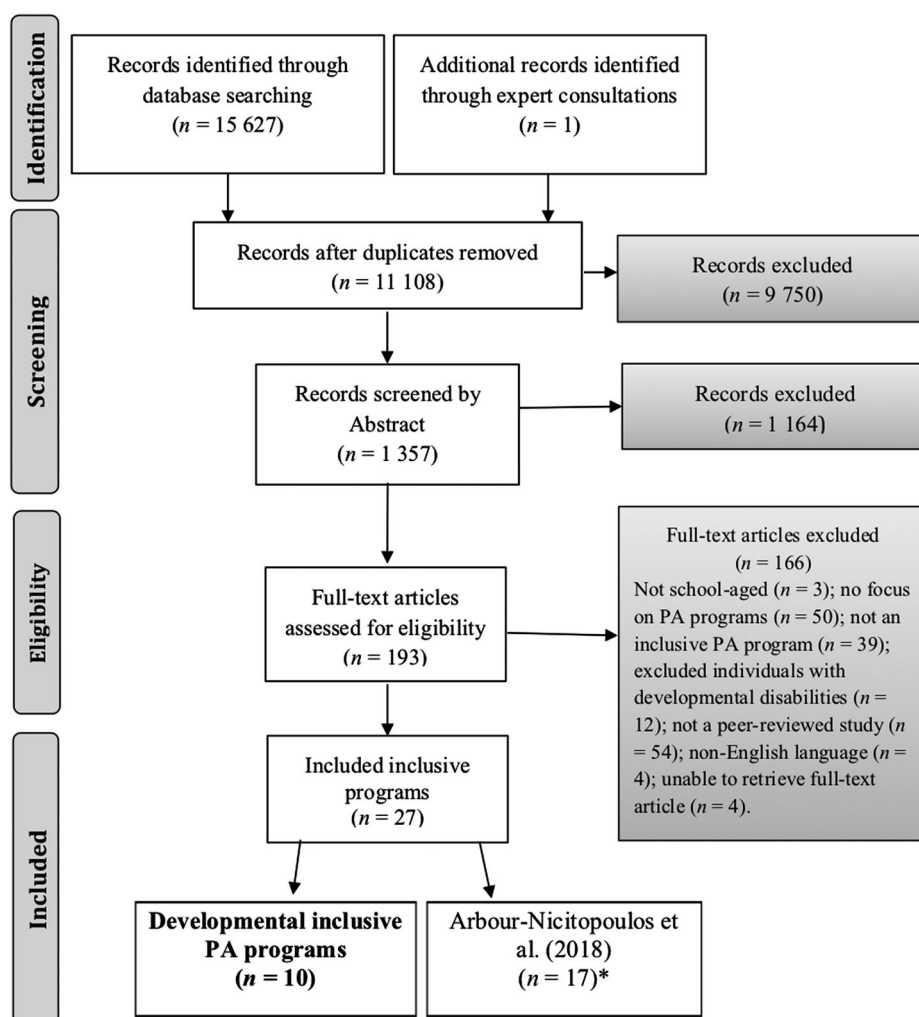


Figure 1 Study identification, screening, and inclusion process. *The current scoping review was conducted in parallel with the scoping review of children and youth with physical and sensory impairments (Arbour-Nicitopoulos et al. 2018b).

it can be difficult to change teachers’ attitudes towards inclusion and provision of modifications to activities to meet all children’s and youths’ needs (Goodwin and Watkinson 2000, Tant and Watelain 2016, Wilhelmsen and Sørensen 2017). Furthermore, providing the necessary supports in schools may be difficult (e.g., cost) but are necessary for children’s positive outcomes (Qi and Ha 2012).

While the outcomes of inclusive physical education practices and the experiences of students and teachers within such settings have been well-documented (e.g., Qi and Ha, 2012, Tant and Watelain 2016, Wilhelmsen and Sørensen 2017), few studies have addressed the processes and outcomes of inclusive PA programming in out-of-school settings. An out-of-school PA program is one that occurs external to the educational curriculum, and can be offered within a school either before- or after-school hours (e.g., Boys and Girls Clubs), or in the larger community such as at a recreational facility in the evenings and/or on weekends. Out-of-school settings may provide unique opportunities that are not available during school hours (e.g., participation in a specific adapted sport), and offer additional support not

available in school (e.g., family respite and adapted sport experts) to children and youth with physical disabilities (Arbour-Nicitopoulos et al. 2018b, Orr et al. 2018, Wiecha et al. 2014).

Among children and youth with mobility and/or sensory impairments (e.g., vision, hearing), inclusive out-of-school PA programs are associated with positive social skills and peer relationships, physical skill development, and psychosocial well-being (Arbour-Nicitopoulos et al. 2018b). However, for children and youth with impairments in social skills and/or cognition such as autism spectrum disorder, Down syndrome, and intellectual disabilities, there may be unique functional issues to consider that differentiate them from individuals with mobility and/or sensory impairments. These considerations and associated barriers to out-of-school PA program participation include: task comprehension and understanding, non-verbal communication, withdrawn and stereotyped behaviors, and sensory sensitivities (Developmental Services Ontario 2018, Temple and Walkley 2007). Thus, the previous research supporting inclusive out-of-school PA programs for children and youth with mobility and/or sensory

impairments is not necessarily generalizable to those with impairments in social skills and/or cognition.

The purpose of this scoping review was to examine inclusive out-of-school PA programs and interventions (hereafter collectively referred to as “programs”) for children and youth (ages 5–18 years) with impairments in social skills and/or cognition. Building directly from the previous scoping review on children and youth with mobility and/or sensory impairments (Arbour-Nicitopoulos *et al.* 2018b), the research questions consisted of the following:

1. What are the characteristics (e.g., settings, task and/or environment modifications, and instructor expertise) of inclusive out-of-school PA programs for children and youth with and without impairments in social skills and/or cognition?
2. What are the outcomes associated with participating in inclusive out-of-school PA programs for children and youth with and without impairments in social skills and/or cognition?

Methodology and method

Overview of search strategy

We replicated the process that was used in the scoping review focused on children and youth with mobility and/or sensory impairments (see Arbour-Nicitopoulos *et al.* 2018b for a detailed description of this process) that was based on established scoping review guidelines (Arksey and O'Malley 2005, Levac *et al.* 2010, Tricco *et al.* 2018). This replication permitted a comparison between the two reviews. Seven databases (SportDiscuss, PE Index, ERIC, CINAHL, MedLine, PsychInfo, and Embase) were searched using keywords around disability, PA, age, and inclusion (see Arbour-Nicitopoulos *et al.* 2018b for the full list of keywords). All included studies' reference lists were manually reviewed for relevant articles. The current review focused on a subset of studies that included children and youth with impairments in social skills and/or cognition from the original sample of papers retrieved in our initial search (1980–July 2016) that included all disabilities (see Figure 1). An updated search was conducted to November 2018 to capture studies published since July 2016. An expert international panel of seven researchers (JdG, DG, ML, CM, RS, NS, and KV) in the area of childhood disability and PA aided in the original literature search by suggesting additional titles to consider for inclusion in the review.

Inclusion criteria

Selected studies needed to: (1) focus on children and/or youth ages 5–18 years, with at least 50% of the sample in this age range; (2) have included at least one child and/or youth with an impairment in social skills and/or cognition AND one child and/or youth without a disability; (3) be peer-reviewed, original research that used

a qualitative, quantitative, or mixed methods study design; (4) focus on an out-of-school PA program; and, (5) be written in English.

Exclusion criteria

Studies that included samples with a mix of children and/or youth with impairments in social skills and/or cognition and those with mobility and/or sensory disabilities were excluded. This decision reflected the many challenges with identifying the specific impact of inclusive out-of-school PA programs for children and youth with impairments specific to social skills and/or cognition when studies have mixed disability groups, such as not being able to understand the effects of disability on functioning (e.g., motor versus social effects) and the modifications that may be necessary to adapt programs to meet their needs (e.g., adaptive equipment versus additional staff).

Overview of methods

Two reviewers (VG and KO) scanned the final set of included articles following eligibility screening and extracted the data, creating a summary of the findings and full data charts, including headers such as: study design, participant demographics, measures, and outcomes. The same two reviewers then categorized the stated intervention targets/outcomes of the nine included studies into outcome themes (i.e., anthropometrics and fitness, motor and sport skills, psychological well-being, and socialization). These four themes were then presented to the research team as part of the data spreadsheets described above. The research team reached consensus on the themes.

Study reporting quality

The same two reviewers independently assessed the study reporting quality of each included article using the 16-item quality assessment tool (QATSDD), which assesses all aspects of a publication including theoretical foundation, methodology, and discussion (Sirriyeh *et al.* 2012). The QATSDD was chosen as it allows comparisons among quantitative, qualitative, and mixed methods study designs. All discrepancies in quality scores were discussed by the two reviewers, with consensus being reached, when necessary, with the assistance of a third reviewer (KPAN). The QATSDD provides a percentage score to compare reporting quality across studies; however, there are no guidelines to suggest values of high or low reporting quality. Thus, based on the guidelines applied in an earlier scoping review (Arbour-Nicitopoulos *et al.* 2018b), the following cut-points were used: less than 60% (low-quality reporting), 60–80% (moderate-quality reporting), and greater than 80% (high-quality reporting).

Over four meetings in the review process (each ranging in length of 60–120 minutes), the research team

reviewed and discussed the emergent findings from the data charts and study reporting quality evaluations, re-reading the articles when necessary to clarify contents of the data charts, and confirming decisions for the evaluation. Finally, two members of the expert panel with expertise in intellectual disabilities (initials removed) reviewed the final draft of the scoping review results and provided feedback on the findings and their implications.

Authorship background

The reviewers (VG and KO) and the larger research team (FVW, ACM, GEF, and KPAN) have extensive research, clinical, and programming backgrounds working with children and youth with impairments. The researchers' have a range of foci from exercise and sport psychology to mental health to physical literacy and motor skills. All authors have previously conducted scoping reviews. We met as an authorship team regularly throughout the review, and the two reviewers met more frequently (a few times a month during the review process).

Results

Identified studies

Figure 1 depicts the screening process used to identify the included studies. Initially, 15,627 references were identified in the data base search. Upon removing duplicates, 11,107 titles were screened, of which 1,356 abstracts were screened, leaving 192 full text articles to screen using the inclusion/exclusion criteria. Ten studies met the eligibility screening criteria; none of the additional articles ($n=2$) from the expert panel met the review's eligibility criteria. Two studies have the same dataset (Baran et al. 2013, Özer et al. 2012). Table 1 presents the quality, participant and program characteristics, and outcomes of each included study. These studies are described below through detailed summaries as well as study-specific examples to illustrate when further details were provided by the study authors.

Study characteristics

All studies were published after 2000: 2000–2005 ($n=1$ [Castagno 2001]), 2006–2010 ($n=5$ [Baran et al. 2009, Hutchison et al. 2008, Ninot and Maïano 2007, Sutherland and Stroot 2009, 2010]), and 2011–2018 ($n=4$ [Baran et al. 2013, McConkey et al. 2013, Özer et al. 2012, Stanish and Temple 2012]). The studies were conducted in the United States ($n=4$ [Castagno 2001, Stanish and Temple 2012, Sutherland and Stroot 2009, 2010]), Turkey ($n=3$ [Baran et al. 2009, 2013, Özer et al. 2012]), Canada ($n=1$ [Hutchison et al. 2008]), Europe ($n=1$ [McConkey et al. 2013]), and France ($n=1$ [Ninot and Maïano 2007]). Six studies were quantitative (Baran et al. 2009, 2013, Castagno 2001, Ninot and Maïano 2007, Özer

et al. 2012, Stanish and Temple 2012), and four were qualitative (Hutchison et al. 2008, McConkey et al. 2013, Sutherland and Stroot 2009, 2010). Study designs included: pre-post testing ($n=3$ [Baran et al. 2009, Castagno 2001, Stanish and Temple 2012]), randomized controlled trials ($n=3$ [Baran et al. 2013, Ninot and Maïano 2007, Özer et al. 2012]), ethnographies ($n=2$ [Sutherland and Stroot 2009, 2010]), a case study ($n=1$ [Hutchison et al. 2008]), and an interview-based qualitative study ($n=1$ [McConkey et al. 2013]). A single dataset was used for two studies (Sutherland and Stroot 2009, 2010). Reporting quality appraisal ratings varied from 52.4 to 88.1% across the ten studies (see Table 1). Lower quality reporting scores were due to underreporting of recruitment strategies, lack of critical reflection on the study (i.e., strengths and limitations), and minimal user involvement in study development, design, and dissemination.

Program participants

Types of impairments in social skills and cognition

The range of impairments in social skills and/or cognition (self- or parent-reported) included: unspecified intellectual and developmental disabilities ($n=6$ [Castagno 2001, Hutchison et al. 2008, McConkey et al. 2013, Ninot and Maïano 2007, Özer et al. 2012, Stanish and Temple 2012]), autism spectrum disorder ($n=2$ [Sutherland and Stroot 2009, 2010]), mild intellectual disability ($n=2$ [Baran et al. 2009, 2013]), and Down syndrome ($n=1$ [Stanish and Temple 2012]).

Sample size

Total sample size varied from 3 to 171 participants across the 10 studies. There was a range of 1–156 participants with an impairment in social skills and/or cognition, and 1–171 participants without an impairment in social skills and/or cognition. Two studies did not include separate sample size information for participants with versus without an impairment in social skills and/or cognition (Hutchison et al. 2008, Ninot and Maïano 2007).

Age and gender

Studies had samples with a large age range (6–60 years of age) that were identified as children and youth ($n=3$ [Hutchison et al. 2008, Sutherland and Stroot 2009, 2010]), youth ($n=6$ [Baran et al. 2009, 2013, Castagno 2001, McConkey et al. 2013, Ninot and Maïano 2007, Özer et al. 2012]), or a mix of youth and adults ($n=1$ [Stanish and Temple 2012]). Three studies were composed solely of male participants (Baran et al. 2009, 2013, Özer et al. 2012), and one of females (Ninot and Maïano 2007). Of the remaining six studies that included both genders, the majority of participants were male in five of them (Castagno 2001, Hutchison et al. 2008, McConkey et al. 2013, Sutherland and Stroot

Table 1. Summary of included articles' methodological quality, participant and program characteristics, and key findings (outcomes), organized by methodology.

	Study Authors, Country, Design, Theory (if applicable)	Quality Rating	Sample Size (N, Female)	Age - Years (Range and Mean [M])	Disability	Program Details	Data Collection Tool(s)	Key Findings
Qualitative	Hutchison et al. 2008 Canada Case Study (Social Justice Philosophy)	88.1 (high)	3 (1 female)	6-15 M = 10	Developmental Disability	Camp Crystal Sands (Project Rainbow) – Traditional Overnight Summer Camp Experience Canoeing, hiking, archery, campfire, arts, crafts, ropes, basketball, volleyball, and swimming 8-week camp (1 week with study)	Participant Observation, Document Analysis, Interviews with Staff	(+) partnership to develop inclusion activities (+) full participation, in all activities (+) structured camp team to support (-) need more socialization opportunities
	McConkey et al. 2013 Europe (Germany, Hungary, Poland, Serbia, & Ukraine) Interviews	76.2 (moderate)	156 athletes 106 partners 65 coaches Males > Females (not specified)	12-25 years (M not specified)	Intellectual Disability	1 inclusion counselor, 2 general counselors/cabin of 10 attendees; adapted equipment Unified Sport (Special Olympics) – 7-a-side football and basketball No further program details provided	Athlete information provided by coaches, semi-structured interview guide	(+) all youth: stamina, technical skills, status in school and community, self-belief, and self-esteem, confidence, communication skills, involvement external to sport, friendships with teammates (+) equality and respect fostering relationships (+) ND youth: attitudes and social relationships with D (+) program-community alliances fostering recruitment (+) D social interaction with others & social acceptance (+) D defined role in group as helper – valued team member
	Sutherland and Stroot 2009* USA Ethnography (Social Cognitive Theory)	81.0 (high)	7 (3 female)	10-14 years (M not specified)	High functioning autism spectrum disorder	Smith Rock trip (No Limits) 3 full days Rock climbing trip: climbing, campfire, teambuilding activities Unspecified trip leaders Smith Rock trip (No Limits) 3 full days Rock climbing trip: climbing, campfire, teambuilding activities Unspecified trip leaders	Semi-structured interviews, observation checklist (5-point Likert scale)	(-) First contact due to existing group dynamics of ND youth (+) Opinion of one ND youth can change others' opinions of D (+) Teambuilding activities fostered social acceptance (-) D only interacted with ND youth in program; getting along with others (-) ND youth did not learn about disability
Quantitative	Baran et al. 2009 Turkey Pre-Post Test	52.4 (low)	46 (0 female)	12-15 M = 14 years	Mild Intellectual Disabilities based on Leither and WISC-R Intelligence tests	Unified Sport (Special Olympics) – Soccer 8 weeks, 3x/week, 90 minutes/session Coaches: certified for working	Special Olympics Unified Sports Questionnaire for (a) Parents, Teachers, and Coaches; (b) Athletes,	

(Continued)

Study Authors, Country, Design, Theory (if applicable)	Quality Rating	Sample Size (N, Female)	Age - Years (Range and Mean [M])	Disability	Program Details	Data Collection Tool(s)	Key Findings
Baran et al. 2013 Turkey Randomized Comparative Intervention	66.7 (moderate)	98 (0 female)	12-15 M = 14.5 years	Mild Intellectual Disabilities based on an IQ < 50	with intellectual disabilities and soccer; 2 coaches per group of 4 youth with a head coach (total of 9 coaches) Unified Sport (Special Olympics)—soccer 8 weeks, 3x/week, 90 minutes/session Coaches: certified for working with intellectual disabilities and soccer; 2 coaches per group of 4 youth with a head coach (total of 9 coaches) Transportation provided to all participants; information session for parents and youth	Partner, Family Member, and Coach Brockport Physical Fitness Test Football Athletes Skills Assessment	(-) ND youth enjoyment (+) parental report D and ND youth had better well-being 72.5% D attrition 37.5% ND youth domination 50% ND youth domination 37.5% reported trouble matching age (-) ND youth flexibility & shooting compared to D (+) D: hand grip, standing long jump and flexed & hang (+) D slalom compared to ND youth (-) Pass, dribble & shoot, & total score ND youth in control compared to all other groups
Castagno 2001 USA Pre-Post Test	66.7 (moderate)	58 (1 female)	11-14 M = 13 years	Mental Retardation Mean IQ = 67	Unified Sport (Special Olympics)—Basketball 8 weeks, 3x/week, 90 minutes/session Coach: one with no assistants; 4 teams of 12-19 players each; followed the Unified Sports Guidebook for lesson plans; intramural tournament at end	Katz-Zigler Self-Esteem Inventory; Basketball Sport Skill Assessment; Kaufman Brief Intelligence Test; Adjective Checklist; The Friendship Activity Scale; Unified Sports Questionnaire	(+) D: self-esteem, basketball skills, positive adjectives, friendship (effect sizes: .43-1.14) (+) ND youth: self-esteem, basketball skills, friendship, attitudes towards D, positive adjectives (effect sizes: .22-.80) (+, coach reported) all youth: sport interest, adherence to Unified Sports, interest in new sports, interest in new friends, self-esteem, self-confidence, happiness (+, coach reported) most (70-83%) ND youth: self-reliance, tolerance of others, desire to connect with the community, school motivation (NC, coach reported) all youth conflict with peers and family

(Continued)

Study Authors, Country, Design, Theory (if applicable)	Quality Rating	Sample Size (N, Female)	Age - Years (Range and Mean [M])	Disability	Program Details	Data Collection Tool(s)	Key Findings
Ninot and Maïano 2007 France Randomized Controlled Trial	59.5 (low)	48 (48 female)	13-17 M = 15 years	Mild-moderate intellectual disability of non-organic origin (40-78 on Wechsler Intelligence Scale for Children)	Competitive swimming and basketball 21 months, 2 hours/week, 12 competitions 4 teams with trained coaches: basketball segregated, swimming segregated, basketball inclusive, swimming inclusive 2 control groups: physical education & sedentary Unified Sport Soccer vs. traditional soccer (segregated teams) 8 weeks, 3x/week, 90 minutes/session Coaches had "necessary experience and qualifications both for teaching children with ID and for coaching the sport of soccer." (p. 232)	Harter's SPP (perceived competence); scholastic acceptance, athletic competence, physical appearance, conduct General self-worth	(-) General self-worth: Basketball inclusion group less than physical education control (-) Perceived athletic competence: Basketball inclusion less than swimming and basketball segregated groups (NC) Social acceptance (+) competence for D youth (+) parents' perceptions of D youth for internalizing and externalizing behaviors (+/-) control group baseline higher positive associations that decreased post-program (+) control group child behavior ND youth (-) ND youth adjective and friendship association with D youth in control group (+) ND youth in intervention adjective association with D youth (+) 89.5% & 88.3% attendance for D and ND youth, respectively (+) Exercise engagement: Aerobic (84%), Stretching (89.5%), Strength (44.4%) (+) all youth fitness: curl-ups, 6-minute walk test, body mass index
Özer et al. 2012 Turkey RCT	71.4 (moderate)	76 (0 female)	12-15	Intellectual Disability	Team Up for Fitness (YMCA) 15 weeks, 2x/week, 60 minutes/session Certified fitness trainers created individualized exercise plan, ND peer acted as the 'workout buddy' Training session for ND peer partners	Attendance, Exercise engagement (tracking all physical activity, exercise records for the sessions), Brockport Physical Fitness Test, 6-Minute Walk Test, Body Mass Index	
Stanish and Temple 2012 USA Pre-Post Test	69.0 (moderate)	34 (19 female)	15-21 M = 17.8 years (D) M = 16.4 years (ND)	Intellectual Disability IQ <75			

D: disability; IQ: intelligence quotient; M: mean; NC: no change; ND: no disability; YMCA: Young Men's Christian Association; *indicates one data set across multiple articles.

2009, 2010), and female in one study (Stanish and Temple 2012).

Program characteristics

Settings

Programs were conducted across a variety of settings, specifically: Special Olympics' Unified Sports ($n=5$ [Baran et al. 2009, 2013, Castagno 2001; McConkey et al. 2013, Özer et al. 2012]), a rock climbing program ($n=2$ [Sutherland and Stroot 2009, 2010]), an overnight summer camp ($n=1$ [Hutchison et al. 2008]), a multi-sport intervention ($n=1$ [Ninot and Maïano 2007]), and a YMCA multi-purpose facility ($n=1$ [Stanish and Temple 2012]).

Activity types and modifications

Four programs were offered at the recreational level (Hutchison et al. 2008, Stanish and Temple 2012, Sutherland and Stroot 2009, 2010), five at a competitive level (Baran et al. 2009, 2013, Castagno 2001, McConkey et al. 2013, Özer et al. 2012), and one did not provide any program-level information (Ninot and Maïano 2007). Modifications made to enhance the delivery of the program sessions consisted of: providing transportation to all participants (Baran et al. 2013, Özer et al. 2012), hosting information sessions for parents and youth (Baran et al. 2013), having modifications available for communication such as picture exchange communication systems (Hutchison et al. 2008), and peer partner training for youth without a disability (Stanish and Temple 2012). Six studies did not specify any (pre-) program modifications (Baran et al. 2009, Castagno 2001, McConkey et al. 2013, Ninot and Maïano 2007, Sutherland and Stroot 2009, 2010).

Four qualitative studies described the program designs, specifically the coach's role, that were believed to foster inclusion in a PA setting for children and youth with impairments in social skills and/or cognition and that should be considered when developing inclusive PA programs (Hutchison et al. 2008, McConkey et al. 2013, Sutherland and Stroot 2009, 2010). In one study, the inclusive aspect of the program was generally perceived as being dependent on the coaches' abilities to modify activities for all members to allow participation (Hutchison et al. 2008). However, no specific coach background training and/or certification was provided within any of the included studies. Coaches modified the activities based on the children's or youths' functional skills and partner dominance, for example, they adapted tasks to functional abilities so that all children and youth had roles, and participants without impairments in social skills and/or cognition did not take on roles of additional staff members (McConkey et al. 2013). The inclusive approaches that were described in some of the studies as being used by staff consisted of: acting as social mediators (e.g.,

intervening during inappropriate interactions between participants; McConkey et al. 2013), being role models of appropriate behaviors (e.g., including each participant in all aspects of the program), informing all members about the various abilities of participants in the program (Hutchison et al. 2008, McConkey et al. 2013, Sutherland and Stroot 2009, 2010), and building relationships with children and youth with and without impairments in social skills and/or cognition through equality and respect (McConkey et al. 2013).

One study (Hutchison et al. 2008) provided more detail on their camp program's inclusion-based coaching focus that used a three-counsellor (coach) model for every group of 10 campers. This model consisted of a lead coach who directed the activity, a maintenance coach who acted as an assistant to the lead coach (including demonstrating social and physical behaviors) and took responsibility for equipment set-up and adjustment, and an inclusion coach who provided hands-on assistance when necessary. At an individual level, coaches first used encouragement with children and youth with impairments in social skills and/or cognition to participate in activities before taking a more directive approach, built meaningful relationships with campers, and created individualized schedules (daily and weekly) for each camper. This three-counsellor (coach) model (no further details provided), along with the physical accessibility and adapted equipment (communicative and physical in nature although no further details provided on equipment type) available at the facility may have contributed to a camp culture that was welcoming to all staff and campers as determined in the original authors' program evaluation (see Table 1).

Program duration

Programs varied from 3 days (Sutherland and Stroot 2009, 2010) to 21 months (Ninot and Maïano 2007) in duration. One study (McConkey et al. 2013) did not report on the program's duration. The most common duration was 8 weeks ($n=5$ of the nine programs that reported length; [Baran et al. 2009, 2013, Castagno 2001, Hutchison et al. 2008, Özer et al. 2012]).

Strategies for optimizing recruitment and program participation

Three studies identified the establishment of community partnerships as a potential solution to participation and retention challenges within out-of-school PA programs (Hutchison et al. 2008, McConkey et al. 2013, Stanish and Temple 2012). For example, Special Olympics' Unified Sports used their existing alliances with community and school networks to recruit youth without impairments in social skills and/or cognition as well as coaches. Families were the predominant source of general support for sustained participation of youth with impairments in social skills and/or cognition within

these programs (e.g., McConkey *et al.* 2013). Some of the community organizations that partnered with the programs provided in-kind support and promotional resources, while Unified Sports also acted as a potential source of employment for all participants after they completed the program (McConkey *et al.* 2013). Specifically, Unified Sports may hire former participants as coaches or other necessary positions.

In one study, community partners divided the responsibilities for developing and maintaining the program (Hutchison *et al.* 2008). Specifically, Camp Crystal Sands, an overnight camp, managed the practical experiences and activities of the program, while Project Rainbow managed the policy, referral, placement, and on-site supports necessary for the camp to run. Project Rainbow gave the inclusion coach at the camp informational and problem-solving support, and coaches and management staff perceived this sharing as vital to the camp's success (Hutchison *et al.* 2008). The end result was a highly positive experience expressed by both the coaches and management staff (Hutchison *et al.* 2008).

Process measures

Attendance

One study reported on a fitness facility program's attendance (Stanish and Temple 2012), noting that youth with and without impairments in social skills and/or cognition missed an average of 10% of their program sessions. As well, three youth with impairments and six without impairments attended further gym sessions outside of program hours. No other authors of the remaining nine studies made comments on attendance.

Program attrition

One study reported on attrition (Baran *et al.* 2009) and identified it as a challenge to managing an inclusive PA program. Specifically, 37.5% of coaches noted attrition among athletes without intellectual disabilities, while 72.5% of coaches noted attrition among athletes with intellectual disabilities.

Study outcomes

This section (see also Table 1) summarizes the outcomes of the ten included studies. The following four outcome areas were derived from our team's categorization of the associated findings in the included studies: anthropometrics and fitness, motor and sport skills, psychological well-being, and socialization. Study reporting quality is indicated in Table 1 alongside the associated findings of each included study. Unless otherwise noted, study outcomes are related to pre-post program designs.

Anthropometric measures and fitness

Three studies (all rated in our appraisal as having low-to-moderate reporting quality [Baran *et al.* 2009, 2013, Stanish and Temple 2012]), showed mixed results as far as program effectiveness. One study reported statistically significant improvements over 15 weeks among all 34 participants on curl-ups, the 6-minute walk test, and body mass index when participants were given an individualized fitness program and a training partner (Stanish and Temple 2012). Likewise, in a separate study, parents reported that their children with and without impairments improved their general physical abilities and overall health over an 8-week Unified Sports program (Baran *et al.* 2009). Physically trained youth with mild intellectual disabilities improved their grip strength, standing long jump, flexed arm hang, and sit-ups as measured using the Brockport Physical Fitness Test and Football Athletes Skills Assessment (Baran *et al.* 2013). No change in flexibility was found for youth with impairments in social skills and/or cognition. Meanwhile, decreases in fitness levels and anthropometric measures, as assessed using the Brockport Physical Fitness Test and a football skills assessment and body mass index, were found for the youth without impairments in social skills and/or cognition. No differences in trunk lifts for any of the youth were reported (Baran *et al.* 2013).

In Baran *et al.*'s (2013) evaluation of a 15-week fitness training program, moderate and large training effects were reported in both trained versus control participants as well as those with versus without impairments in social skills and/or cognition for fitness as assessed using the Brockport Physical Fitness Test. Similarly, in Stanish and Temple's (2012) study of a 15-week individualized fitness program, stretching and aerobic activities were engaged in most often by the youth (89.5 and 84.0%, respectively), with strengthening activities engaged in only 44.4% of the time. Of note, participants had the option not to engage in activities that were developed as part of their individualized fitness program (Stanish and Temple 2012).

Motor and sport skills

Four studies (rated in our appraisal as low- [Ninot and Mañano 2007] or moderate-reporting quality [Baran *et al.* 2013, Castagno 2001, McConkey *et al.* 2013]), reported positive outcomes on motor and sport skills. Moderate to large effect size improvements were shown for sport-specific skills (such as shooting and passing) in youth with and without impairments in social skills and/or cognition (Baran *et al.* 2013, Castagno 2001). Additionally, both groups of participants perceived increases in stamina, as well as technical (e.g., running) and sport skills (e.g., ball control; McConkey *et al.* 2013). However, no differences in competition performance (i.e., wins, losses, or tournament placements) were

detected in a comparison between inclusive and segregated (i.e., only included youth with impairments in social skills and/or cognition) sports programs (Ninot and Maïano 2007).

Psychological well-being

Five studies (two rated in our appraisal as low-reporting quality [Baran *et al.* 2009, Ninot and Maïano 2007]), and three as moderate-to-high reporting quality [Castagno 2001, Hutchison *et al.* 2008, Özer *et al.* 2012], showed mixed program effectiveness results associated with psychological well-being. Youth with and without impairments in social skills and/or cognition reported increased self-esteem (Baran *et al.* 2009, Castagno 2001, Hutchison *et al.* 2008, Özer *et al.* 2012), self-concept, self-confidence (Castagno 2001, Hutchison *et al.* 2008), happiness, competence, independence, and positive attitudes towards sport (Castagno 2001, Özer *et al.* 2012). Among youth without impairments, an 8-week soccer program improved measures of child behavior and word association to their peers with impairments (Özer *et al.* 2012). However, reduced psychological well-being (i.e., overall self-worth and mental health) was reported in two studies (Baran *et al.* 2009, Ninot and Maïano 2007). In an inclusive sport program, youth without impairments reported less sport practice enjoyment at the end of the 12-week program than at the start (Baran *et al.* 2009). Additionally, within an inclusive out-of-school 21-month basketball program, all participants reported lower general self-worth compared to the segregated physical education control condition, and lower perceived athletic competence compared to both swimming and basketball segregated program conditions after the intervention period (Ninot and Maïano 2007).

Socialization

Eight studies (two studies rated in our appraisal as low-reporting quality [Baran *et al.* 2009, Ninot and Maïano 2007], three as moderate-reporting quality [Castagno 2001, McConkey *et al.* 2013, Sutherland and Stroot 2010], and three as high-reporting quality [Hutchison *et al.* 2008, Özer *et al.* 2012, Sutherland and Stroot 2009]), reported on the social outcomes with mixed program effectiveness results. In two studies, youth without impairments interacted with youth with mild intellectual disability (Baran *et al.* 2009) or high-functioning autism spectrum disorder (term used by original authors; Sutherland and Stroot 2009, 2010) during program times, but not outside of the program. One study noted decreased friendship in the control group versus a static assessment of friendship in the inclusive soccer group (Özer *et al.* 2012). The other five studies did not evaluate interactions and/or friendship building between the program members.

In the two studies that evaluated the attitudes of youth without impairments in social skills and/or cognition towards youth with impairments in social skills and/or cognition, results were positive in one (Baran *et al.* 2009) but negative in the other (Castagno 2001). One study that evaluated change in the social acceptance subscale of perceived competence found no significant difference between the experimental (inclusive settings: basketball and swimming) and control (segregated settings: basketball and swimming) groups (Ninot and Maïano 2007). Specifically, Ninot and Maïano (2007) discuss how an overestimation of athletic competence in one group may have influenced the comparison to another group, while also stating that athletic competence did decrease in the inclusive condition. In contrast, in two other studies, coaches and parents reported that youth with and without impairments in social skills and/or cognition improved their peer relationships within and outside the program, as well as their relationship with family members (Baran *et al.* 2009, Castagno 2001), their willingness to try new PA programs (Castagno 2001, McConkey *et al.* 2013), and communication skills (McConkey *et al.* 2013). Baran *et al.* (2009) also reported that youth with impairments in social skills and/or cognition would recommend inclusive PA programs to other children and youth with impairments.

As far as other observations made by the authors in the eight studies that examined socialization-based outcomes, initial group dynamics amongst youth without impairments may have made it difficult for youth with impairments to interact with and join the group until a single member of the pre-established group accepted them (Sutherland and Stroot 2009, 2010). These group dynamics may have been due to some youth with impairments having a preference for taking on an alternative social role in the group including interacting with adults, being a program helper, or being a silent observer (Sutherland and Stroot 2009, 2010). For youth with impairments in social skills and/or cognition who preferred solitude, coaches noted the struggles they had experienced with including these program members in the group activities. This reaction was aligned with the perceived primary role of coaches in this program to make the campers happy and respect their wishes (Hutchison *et al.* 2008).

Expert feedback

The following four recommendations arose from the assessment of the scoping review's final draft by two of the experts from the panel (initials removed). First, these experts noted that discussion must occur between researchers and practitioners with respect to the role that inclusive (i.e., designed for all abilities), integrated (i.e., accommodates many abilities on an as-needs basis), and segregated (i.e., designed for a specific set



Figure 2. Australian Institute of Sport's (2015) wheel of inclusion. Provided with permission from Sport Australia®.

of abilities) programming offer members. Rather than providing one option (e.g., only segregated programs), all three program styles are necessary to meet the diverse needs and goals of children and youth with and without impairments in social skills and/or cognition. These programming options can potentially be provided within a single facility (e.g., community centre). Therefore, moving forward, the intricacies between these programming design options must be thoroughly discussed, provided, and evaluated.

Second, the experts noted some youth in the reviewed studies preferred to work individually or with an adult (e.g., Sutherland and Stroot 2009, 2010). However, this preference was perceived to be the product of activity novelty (i.e., individuals having no experience with participating in inclusive settings prior to the evaluated program) or a programming preference (e.g., they like to be with youth “like them”). This raised the question, is it a learned preference with no previous alternative for comparison for these youth? The current limited opportunities in out-of-school and in-school settings for children and/or youth with impairments in social skills and/or cognition to engage in inclusive PA makes it difficult to understand the reasons for this programming preference.

Third, experts commented that the reviewed studies were based solely on pre-post and cross-sectional evaluation designs. A next step is to look longitudinally at PA adherence after the evaluated program has ended, and to consider health and wellness outcomes to extend beyond the four outcome category targets that were the focus of the reviewed studies. Furthermore, experts asked how inclusive, integrated, and segregated program participation

compare with respect to long-term adherence and outcomes. They suggested that perhaps the co-existence of the three programming designs may be most beneficial long-term as the combination may ultimately meet individuals' socioemotional and physical needs.

Fourth, the included studies did not incorporate or explicitly state the use of theoretical frameworks. In future, researchers should decide at the outset of their study whether to use (or not) conceptual frameworks. The experts recommended that transparency surrounding this decision-making process be included in future study publications to better understand the perspective the research team brought to the program design and evaluation.

Discussion

This scoping review identified and synthesized ten inclusive PA programs in out-of-school settings that involved children and youth with impairments in social skills and/or cognition. Findings highlighted four target outcome areas in the studies reviewed as presented above. The majority of the studies reported a mix of improvement and worsening in the four targeted outcomes over the course of their respective programs.

Process measures (e.g., attendance, monitoring of delivery) were not a primary focus of these studies, nor were there any mention of underlying conceptual or theoretical frameworks from which programs were designed. This is an issue, as process evaluation measures and theoretical frameworks are considered to be essential indicators and criteria for program implementers and researchers (Drum *et al.* 2009). For example, it was evident in the two studies that collected process data (i.e., attendance [Stanish and Temple 2012] and

attrition [Baran *et al.* 2009]) that these forms of data were good indicators of program utility, and as such were essential to consider when interpreting study outcomes. “Attendance” in combination with “involvement” (engagement) have been delineated as the two key concepts in the definition of an individual’s participation (Imms *et al.* 2016). Thus, process data related to attendance may be important, given that motivation for and engagement in PA settings are barriers for individuals with impairments in social skills and/or cognition (e.g., Obrusníková and Cavalier 2011). Hence it is critical that attendance be tracked and considered carefully by program staff for each participant, and also included in study reports.

Coaches must be aware of inadvertently socially isolating sub-groups, and strive to include all participants in ways that are enjoyable and personally meaningful (Evans *et al.* 2018). For instance, coaches can achieve engagement in group activities through actively exploring ways to keep all members of the group together and focused on the task at hand (Hutchison *et al.* 2008). Moreover, when pre-existing or emerging sub-groups appear within a program, such as when established friends join the program and do not engage with other program members, coaches must intervene to facilitate group cohesion (Cronin *et al.* 2011). Consequently, measuring perceived engagement is important (e.g., Stanish and Temple 2012) in future studies. Inclusion of qualitative methodologies in this work may also help to capture this information. It might also be advisable to incorporate new observational measures of engagement such as the Pediatric Rehabilitation Intervention Measure of Engagement-Observation (PRIME-O) (King *et al.* 2017).

Similar to our previous scoping review on inclusive out-of-school PA programs for children and youth with mobility and/or sensory impairments (Arbour-Nicitopoulos *et al.* 2018b), socialization was the most commonly targeted outcome ($n = 7$ studies). In several of the studies, authors noted the reliance on alternative program roles (e.g., child as coach’s assistant; Sutherland and Stroot 2009, 2010) as a common social strategy and sometimes preferred social role that was used to engage children and youth with impairments in social skills and/or cognition in PA programs. The possibility of children or youth undertaking other social roles than what is often expected within PA programs suggests the need to further explore these participation experiences.

Both our previous scoping review (Arbour-Nicitopoulos *et al.* 2018b) and this review highlight the difficulty of initiating interactions between children and youth with varying abilities in PA programs. Our previous review suggested that children and youth without physical impairments often informally act as helpers in inclusive PA programs, specifically within out-of-school settings. In contrast, the PA programs in the

current review incorporated assistants for children and youth with impairments in social skills and/or cognition to allow them to function as full participants (Hutchison *et al.* 2008). The coaches then identified encouraging novel opportunities for campers to interact with one another to develop social skills.

Participation in inclusive out-of-school PA programs was associated with improvements in fitness, as well as motor and sport-specific skills (Baran *et al.* 2009, 2013, Castagno 2001, McConkey *et al.* 2013, Ninot and Maïano 2007, Stanish and Temple 2012). These improvements suggest that inclusive out-of-school PA programs may be a viable option for children and/or youth with varying abilities to meet age-appropriate PA guidelines such as the Canadian 24-Hour Movement Guidelines for Children and Youth (Tremblay *et al.* 2016), as well as improve their motor skills. However, the impact of inclusive PA programs on the psychological well-being of children and youth was mixed (e.g., improved [Baran *et al.* 2009] or decreased [Ninot and Maïano 2007]), a similar finding to our previous review (Arbour-Nicitopoulos *et al.* 2018b). These findings may be due to differing program adherence rates, high baseline outcome measures, and program volume across studies which could not be evaluated further in our review given that only one study (Stanish and Temple 2012) included attendance data. Thus, further research is warranted to rigorously test the impact of inclusive out-of-school PA programs on children’s and youth’s psychological well-being. This research should also consider if there is a level of inclusiveness that is ideal for influencing the targeted outcomes of PA programs (i.e., at what point is there too much adaptation to the activity where it no longer stimulates challenge and growth among all participants).

Due to the limited number of studies in our review that achieved a high-quality reporting rating, we are unable to make unequivocal best-practice recommendations for practitioners, although we have identified some promising approaches for further research. Moving forward, high-quality, rigorous reporting of all studies is vital. Research should be done by providing explicit detail on the program design and implementation—either within the main manuscript or in supplemental materials (see Arbour-Nicitopoulos *et al.* 2018a, Baines 2003, for examples of published case studies). Not only do researchers and practitioners need to understand the outcomes of program participation, they must also understand the context (e.g., time, space, training details) within which the programs are implemented and the processes that enable their success (Drum *et al.* 2009). Implementing elements from the knowledge translation literature (e.g., Graham *et al.* 2006) may prove useful for replication by other practitioners and researchers.

Lastly, the terms “integrated” and “inclusive” were often used interchangeably in the studies that were

reviewed as well as within previous literature (e.g., Arbour-Nicitopoulos *et al.* 2018b, Longmuir 2003). We recognize that terminology changes over time; however, by being explicit in who is involved in a program and in what capacity, much of this confusion could be reduced. Inclusive programs are designed from the outset to meet a full range of functional abilities and needs, going beyond physical attendance in programs to full incorporation and achievement of positive outcomes (UNESCO 2018). In contrast, integrated programs are designed for a specific subgroup (e.g., youth with Down syndrome) and modified, to be best extent possible, in an attempt to meet the needs of individuals who are external to the target subgroup. Integration does not necessarily provide full person-program-environment compatibility. While functionally integrated and inclusive programs may be the same (i.e., the program contains both members with and without impairments), the intended purpose of integrated programs is not to serve individuals outside of the defined subset of the population. Many programs are labelled as inclusive but then are described as integrated; misrepresenting the program context and making comparing programs difficult. Additionally, by not using terminology consistently, use of database keyword searches becomes more difficult with risk of missing relevant studies for consideration.

Moreover, as the expert panelists recommended, the three types of programs (i.e., inclusion, integrated, segregated) need to coexist. An example of how coexistence can occur is outlined in the wheel of participation that was recently proposed by Sport Australia® (see Figure 2; Australian Institute of Sport 2015). While this figure focuses specifically on sport, it can be extended to other types of PA programs—basic principles can be adapted for fitness, education, and general recreation programs for instance. For example, a child with impairments may be involved in all three types of programs to meet their various needs: an integrated swim class with an additional instructor to assist them, an inclusive multi-activity program (e.g., Hutchison *et al.* 2008), and a segregated learn-to-bike program. A single program may also meet multiple program style designs, thus meeting the needs of children with and without impairments. For example, a program can have multiple components where children are working one-on-one to build their skills, then come together with other children in group-based activities (e.g., sports or games) to provide opportunity for social skill development, friendship building, and cooperation (e.g., Arbour-Nicitopoulos *et al.* 2018a, Obrusníková and Cavalier 2011). New programs need to be developed with clear operationalization and reporting of their components, and then be rigorously evaluated to better understand the processes, experiences, outcomes, and best-practices of inclusive out-of-school setting PA programs.

Strengths and limitations

This scoping review was limited by the use of solely English language, peer reviewed articles. Thus, relevant gray literature may have been missed and should be considered in future studies. The use of an expert panel to identify additional articles and expert consultation are methodological strengths of our review. Furthermore, this review included all forms of study designs to explore as much of the gained experiences of inclusive out-of-school PA programming as possible.

Conclusion

In summary, inclusive out-of-school PA programs for children and youth may provide viable recreational opportunities for children and youth with impairments in social skills and/or cognition to build their fitness, motor and sport skills, socialization and, to some extent psychological well-being. Further research attention is warranted to better understand the outcomes associated with existing programs that can then inform the development of well-targeted, engaging, evidence-informed PA programs for these children and youth that foster meaningful participation opportunities.

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