

Physical and Psychosocial Impact of a University-Based, Volunteer Student-Led Running Program for Children With Autism Spectrum Disorder



To the Editor:

Children with autism spectrum disorder (ASD) are frequently excluded from group sports.¹ This accentuates the social isolation inherent in their condition, perpetuates cycles of perceived incompetence in physical activity, and increases susceptibility to weight gain influenced by psychotropic medications.² In a 2015 study of 376 children with ASD, 18.1% of children were overweight and 17% were obese.³ Scarcity of opportunity to participate on athletic teams can contribute to this liability and compound the social isolation inherent in the condition.⁴⁻⁶ Thus, programs that combine relationship building with physical conditioning present a double opportunity to offset significant hurdles for children with ASD. To address these needs locally, a group of volunteer college student-athletes (led by co-author Annie Marggraff) established a weekly Sunday afternoon program for athletic opportunity for children with ASD in the community. The program, Bear Cubs Running Team, was piloted over 5 successive semesters at Washington University in St. Louis, Missouri to empower children with ASD to set achievable physical conditioning goals, provide a forum to support their families, and increase college students' awareness of barriers against and opportunities to meaningful improvements in health and quality of life.

The intervention model was devised according to principles of (1) feasibility: by relying on student-athlete volunteers on a weekly basis; (2) mentorship: through a structure that pairs children with ASD with a consistently available student-mentor; (3) mutual enrichment: maintaining a shared expectation that student volunteers had as much to gain from the experience as the children with ASD; (4) strength-based support: using methods incorporating principles of behavioral analysis; and (5) intervention within a social context: offsetting social isolation, a hazard of the autistic syndrome, through a group-based intervention that includes the entire family of the child with ASD.⁷ Using these 5 principles as guidelines, a free program at Washington University in St. Louis offering weekly

hour-long running practices for children with ASD and their non-ASD neuro-typical siblings was created. Leveraging expert advisory support from the psychological and brain sciences department and facilities allocation by the athletic department, the student-athlete leaders advertised the program on campus (to solicit student-athlete volunteers) and in the community (to recruit families). Student-athlete volunteers were required to commit to each weekly (Sunday) practice for the duration of a semester "session," in addition to an hour of education and training about ASD before selected practices. Training, led by a board-certified behavior analyst, included history and prevalence of ASD, therapy techniques, best practices, and interaction methods. Specifically, volunteers learned the characteristics of ASD, how to engage and encourage participants, and basic behavioral reinforcement strategies related to physical conditioning. There were no restrictions or requirements for participation; youth with ASD (6–15 years of age) with any level of functioning, and non-ASD siblings, were invited to join. Steps in program development are presented in Figure 1.

Participants met at the Washington University athletic facilities for 1 hour each Sunday, guided by a structured schedule that included stretches, running, and games. Selection of games was tailored to each enrolled group in a given semester by a faculty advisor and a board-certified behavior analyst. Practices were offered for 8 weeks in the fall and spring "seasons." "Athletes" (ASD and interested neuro-typical siblings) and "coaches" (volunteer college student-athletes) were paired at the start of a season by the student leaders, with consideration of gender preferences (for some children), age and level of functioning, and the coach's experience working with children with ASD.

Each pair worked 1-on-1 for the 8-week season, fostering a mentoring relationship based on trust. Whenever possible, specific coach-athlete pairings were carried over from fall to spring. The 400-m "time trials" were held at the beginning and end of each season for children who showed interest in tracking their progress. The capstone experience of each season was the team's participation in a local 1-mile or 5K race to incorporate setting goals, foster community integration, and support families. The use of setting goals, time trial feedback, and race completion aimed to improve self-confidence and boost knowledge of personal ability; accounts of these outcomes were reported by parents in anonymous surveys. While coaches and athletes were

FIGURE 1 Program Development

Note: ASD = autism spectrum disorder; BCBA = board-certified behavior analyst.

engaged in practice, parents typically watched from the sidelines, using the free time to connect with other families in a relaxed space that facilitated networking and the formation of new friendships. Rates of participation and retention across successive seasons are listed in Table 1 and were uniformly high; this was particularly noteworthy because, although we are not aware of any established standards for retention rates in athletic programs or support groups for families of children with autism, historic accounts of consistency in attendance are often characterized as “low” or “poor” despite the perceived value of support groups.⁸

Of the 103 total participants, 52 children (50.4%) participated in at least 1 “pair” of time trials ($n = 38$ boys, $n = 14$ girls), defined as repeated measures of 400-m lap time recorded over the course of the 5 seasons. The successive, partly overlapping cohorts of children over the first 5 seasons afforded opportunity for analysis of repeated measures data and group means. We observed statistically significant improvements from base lap time (mean 185.46, SD 56.93) to subsequent best lap time (mean 159.87, SD 49.72; $t_{51} = 4.92, p < .01$), with a mean improvement of nearly 30 seconds (Cohen effect size, $d = 0.45$). For a subgroup who participated in 4 seasons ($n = 17$) of time

trials, we observed similar results (Cohen effect size, $d = 0.58$), suggesting that even a single season of participation was associated with gains that were observed to be sustained by children who returned in successive seasons.

Narrative survey responses from parents noted very positive perceptions about the extent to which the program offset social isolation (for some families, practices were the only weekly social activity outside school that the children accepted without protest), reluctance to engage in physical exercise, and worries about physical competencies. Parents provided written survey feedback to the program leaders with perspectives on the unique social opportunity for their children to join a team, appreciation for the volunteer mentorship of college student-athletes, the benefits of a constructive activity in which children with ASD and their siblings could be co-engaged, the experience that children and parents looked forward to the Sunday sessions, and observations of improvements in the children’s self-esteem as a function of participation. Student-coaches appreciated that the program allowed them to meaningfully volunteer and become knowledgeable about ASD. Local media coverage of the program (Figure 2) reflected a substantive benefit of the program in raising community awareness of the physical challenges faced by many children with ASD, publicized an example of the means by which those challenges can be addressed by the community, and accelerated student participation and athlete enrollment.

This report effectively constitutes a case series, and although the sample size was adequate to detect a significant improvement in the children’s running times, there are some limitations of the interpretation of the data from this pilot experience. These include the fact that the pre- and postintervention running times were not contextualized in a randomized design, serial weights were not recorded, and the parent-report surveys were unstructured. It is our hope that, in future iterations of this program model, more formal appraisal of the impact of the program on the well-being of children and families—and the knowledge, attitude, and beliefs about ASD gained by student-

TABLE 1 Program Participation and Retention Rates

	Semester 1	Semester 2	Semester 3	Semester 4	Semester 5	Total Number Unique Children, Families, Coaches
Children, n	27	42	52	64	67	103
Families (new families), n	20 (20)	31 (16)	35 (9)	45 (19)	47 (14)	81
Families returning from prior season, %	N/A	75	84	74	73	N/A
Coaches, n	28	46	58	65	85	118

Note: N/A = not applicable.

FIGURE 2 Local Media Coverage

Note: Reprinted with permission from the St. Louis Post Dispatch. Washington University athletes create running club for children with autism (September 15, 2016).

volunteers—will be ascertained to specify the potential impact of disseminating this highly feasible model.

In summary, this minimal-cost, student-volunteer-run program resulted in statistically significant improvements in 400-m running times of children with ASD, conferred significant opportunity for college students to learn about ASD and volunteer in their community, and addressed relative shortages of consistent support opportunities for families of children with ASD in St. Louis. Participation and retention rates were extremely high and related to parents' perceptions about social (engagement with student-mentors, interaction with other children and families), behavioral (overcoming inhibition about physical exertion, self-confidence, desire to improve), and physical (running times) gains among their children affected by ASD and neuro-typical siblings. This experience demonstrated the feasibility of harnessing the available time and commitment of student volunteers to address ASD-related morbidities (of individuals and families) that are often left unaddressed in conventional clinical treatment paradigms. The success of this experience suggests significant opportunity for clinical and academic child psychiatry programs to stimulate and collaborate with volunteer efforts of this kind, for which future studies of qualitative and quantitative impact (direct and secondary) seem strongly warranted in replication attempts. We present this summary as a recommendation and a call to action to the field to consider untapped opportunity

to jointly empower student volunteers, parents, and the community to respond to aspects of isolation and marginalization that too often—disproportionately and unnecessarily—burden children and families affected by autism.

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