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A Structured Soccer Program Designed to Aid in the Development of Children with Autism

By

Lydia Lawson

This thesis is submitted in partial fulfillment of the requirements for Honors in the Discipline in Occupational Therapy and the Elizabethtown College Honors Program.

May 1, 2020

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A Structured Soccer Program Designed to Aid in the Development of Children with Autism

Honors in the Discipline Senior Thesis

Lydia Lawson

Elizabethtown College

Abstract

Autism spectrum disorder (ASD) is a disorder characterized by deficits or impairments in social, cognitive, and motor abilities. These developmental deficits often separate children with ASD from their typically developing peers. Children with autism often refrain from or struggle to take part in play. This is because of the deficits they experience and because there are limited opportunities that foster situations for them to be successful in play. Incorporating play into intervention has been shown to be effective with this population. Participation in play allows for motor skill development, social interactions, and often cognitive stimulation. It is necessary to have resources available and programs in place that are exclusively for children with ASD to help them develop social, motor, and cognitive skills. One such program that would be beneficial in doing so is a structured group play program that involves physical activity.

Keywords: autism spectrum disorder, childhood, intervention, structured play, development

Literature Review

Autism Spectrum Disorder (ASD)

Autism spectrum disorder (ASD) is considered a pervasive developmental disorder characterized by impairments in stereotypical behaviors and interests, social functioning, and communication abilities (Smith & Puymbroeck, 2011). This disorder impairs a person's ability to communicate effectively, establish relationships, interact socially, and respond appropriately in certain environments (Yanardağ, Birkan, Yilmaz, Konukman, & Ağbuğa, 2011).

The Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5) includes specific criteria that a person must meet for a proper diagnosis of ASD (Mash & Wolfe, 2018, Table 6.1). The first criterion is persistent deficits in social communication and social interaction across multiple contexts, as manifested by deficits in the following three areas: (1) social-emotional reciprocity, (2) nonverbal communicative behaviors used for social interaction, and (3) deficits in developing, maintaining, and understanding relationships. The second criterion is displaying restricted, repetitive patterns of behavior, interests, or activities, as manifested by at least two of the following areas: (1) stereotyped or repetitive motor movements, use of objects, or speech, (2) insistence on sameness, inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behaviors, (3) highly restricted, fixated interests that are abnormal in intensity or focus, or (4) hyper- or hypo-reactivity to sensory input or unusual interest in sensory aspects of environment. The third criterion is that symptoms must be present in the early developmental period. A fourth criterion is that symptoms cause a significant impairment in functioning, including social, occupational, or other important areas. The fifth and final criterion is that these disturbances are not better explained by a diagnosis of either intellectual disability (ID) or global development delay (Mash & Wolfe, 2018, Table 6.1).

Prevalence of ASD

According to Zhao and Chen (2018), the worldwide population of people diagnosed with autism spectrum disorder (ASD) is growing significantly. Autism is considered the fastest growing developmental disability in the United States (Yanardağ, et al., 2011). It is the most common pediatric diagnoses in the United States (Bhat, Landa, & Galloway, 2011). The most recent estimation of people diagnosed with ASD in the United States was calculated in 2014, with the prevalence being that 1 in 68 children are diagnosed (Zhao & Chen, 2018; Tanner, Hand, O'Toole, & Lane, 2015).

Impairments/Deficits Experienced in Childhood

Children with ASD experience deficits or impairments in motor, social, and cognitive skills. “In DSM-V, autism or ASD is a severe neurodevelopmental disorder with an onset in early development, which is characterized by significant and persistent deficits in social interaction and communication skills and by stereotyped patterns of behaviors, interests, and activities” (Mash & Wolfe, 2018, p. 162). These developmental deficits often separate these children from their typically developing peers.

There are numerous assessment tools that researchers and clinicians use to measure and assess gross and fine motor skill performance in children. Some examples of these assessments used for children with ASD include the *Bruininks-Osteretsky Test of Motor Proficient, Second Edition, the Movement Assessment Battery for Children, or the Test of Gross Motor Development* (Pan, et al., 2017; Bhat, Landa, & Galloway, 2011). Pediatric clinicians usually assess gross and fine motor skill milestones in children (Bhat, Landa, & Galloway, 2011). Significant motor skill impairments have been identified in children with ASD. These motor

skills include locomotor skills, such as running, hopping, or jumping, object control, such as catching, throwing, and striking, gross motor skills, including coordination, balance, and agility, and fine motor skills, such as precision, integration, precise coordination, and manual dexterity (Pan, Chu, Tsai, Sung, Huang, & Ma, 2017). Studies that examine motor impairments, specifically of children diagnosed with ASD, suggest that these children present with “low muscle tone, significant motor incoordination, poor balance, imitation and praxis impairments, and the presence of motor stereotypies such as arm flapping or preoccupation with objects” (Bhat, Landa, & Galloway, 2011, p. 1122).

Some researchers propose that children with ASD experience deficits in social interaction and communication skills, as a result of the motor skill impairments they have. Bhat, Landa, and Galloway (2011) propose that motor and social impairments in children with ASD are linked. They present the idea that children need the ability to perform functional movements and engage in social interactions and because children with ASD exhibit motor abnormalities, these children struggle to initiate and maintain social interactions throughout their day.

Children with ASD often present with impairments in their cognitive abilities, especially when compared to their typically developing peers. Executive dysfunction has been frequently associated with autism spectrum disorders. The deficits in executive functioning have been linked to decreased adaptive functioning capabilities and greater symptoms related to autism in individuals with ASD (Rosenthal, et al., 2013). Rosenthal et al. (2013) explored the anticipated developmental trajectory of executive functioning in children with ASD. Their study was a large cross-sectional cohort study that evaluated this trajectory based on parent-reported executive functioning problems their children experienced during childhood and adolescence. They used the parent form of the *Behavior Rating Inventory of Executive Function* (BRIEF) to assess

executive functioning skills in everyday activities. The subscales are initiate, emotional control, shift, inhibit, organize/plan, organization of materials, working memory, and monitor. The researchers concluded that children with ASD show increasing impairments in executive functioning when compared to children in their normative sample. The specific executive functioning deficits they recorded were problems with self-initiation, working memory, organization of materials, and following multistep directions. These findings indicate that metacognitive abilities develop at a slower rate in children diagnosed with ASD compared to children without this diagnosis (Rosenthal et al., 2013).

General Interventions for Children with ASD

There are several approaches to intervention for children with ASD. These treatment approaches have been developed to address the symptoms related to their diagnosis of ASD and the social, motor, and cognitive deficits they experience.

One main philosophy of intervention for children with autism is early intervention. “Early intervention (EI) is defined as intervention implemented as soon as the disability is first identified, with the aim of reducing the impact of disability for the individual, their family, and the wider community” (Viven, Clark, Paynter, & Dissanayake, 2018, p. 1673). Early intervention has showed developmental benefits, including improvements in language, cognitive functioning, and adaptive behavior for children with ASD. Behaviorally-based interventions are a well-known type of intervention approach to treating children with ASD that focuses on fostering skill development (Viven, Clark, Paynter, & Dissanayake, 2018). Some specific intervention programs draw on characteristics from both behavioral and developmental science. These combined interventions are referred to as naturalistic developmental behavioral interventions, and one model designed specifically for young children is called the *Early Start Denver Model*

(ESDM). This model is a comprehensive early intervention approach that “facilitates social engagement and active learning, and aims to minimize the impact of autism symptoms on children’s learning by targeting deficits in attention, imitation, language, play skills, affect sharing and social orientation” (p. 1674). Viven, Clark, Paynter, and Dissanayake (2018) sought to investigate the outcomes of a community-based group EDSM on children with ASD in comparison to children who received another group community-based early intervention option. Both groups showed increases in cognitive function at school age, indicating that they both made significant gains over time. This study adds to the literature that indicates early school age outcomes for children diagnosed with ASD are promising after receiving early intervention services to address their diagnosis.

Two specific intervention approaches designed to address social communication of children with ASD include pivotal response treatment (PRT) and structured applied behavior analysis (ABA). The PRT approach involves operant teaching principles, which incorporates variables that are known to improve responsiveness, responding rate, and positive affect. (Mohammadzaheri, Koegel, Rezaee, & Rafiee, 2014). The structured ABA approach includes defining very specific targets of intervention. These intervention targets are addressed using the antecedent-behavior-consequence chain. Mohammadzaheri, Koegel, Rezaee, and Rafiee (2014) carried out a study to compare these two types of interventions. They used a randomized clinical trial design to compare these two interventions using two groups of children that were matched according to their age, gender, and mean length of utterance. They were specifically looking at which intervention approach resulted in greater gains in targeted language areas and greater generalized gains in untreated areas as measured by the *Children’s Communication Checklist*. The results of this study showed that PRT was more effective in improving the social

communication skills in this population of children with ASD. These findings contribute to the existing literature that supports the use of PRT (Mohammadzaheri, Koegel, Rezaee, & Rafiee, 2014).

Another type of intervention approach is psychomotor intervention, which helps to improve body awareness and different learning concepts. The key themes of psychomotor interventions include awareness of one's body in time and space, having a sense of rhythm and timing, interacting and recalling the forces of movement, and movement flow (ElGarhy & Liu, 2016). There are specific programs called psychomotor intervention programs (PIP) that are designed to create a safe environment for children, build a strong sense of self-esteem, and create situations in which children can develop social skills. PIP is recognized in most European countries, but its utilization in the United States is limited. PIP involves non-competitive games and movements that are related to sports. These movements focus on a child's body, temporal, and spatial sensory-processing abilities. PIP has been used primarily with typically developing children and shown to improve their visual-motor skill performance. ElGarhy and Liu (2016) sought to examine the effects of PIP on students with ASD. These researchers wanted to observe the effects of using PIP for students with ASD and investigate if their body awareness and psychomotor concepts improved. They concluded that children with ASD showed improvements in space concepts, body concepts, and body awareness (ElGarhy & Liu, 2016).

Goals/Focus of Interventions

Interventions for children with ASD focus on three main areas, including social, motor, and cognitive development. Interventions aim to foster situations in which children will develop and improve social communication skills. This is done by increasing social interactions when interventions have more than one participant in them. This helps children put their social skills

into practice. Another goal of interventions for children with ASD is to improve upon motor skill impairments or deficits. Physical activity is often one of the main components of interventions because it helps with motor skills, such as balance, coordination, and body awareness (ElGarhy & Liu, 2016). Children with ASD experience deficits in gross motor, fine motor, postural control, and imitation or praxis impairments (Pan et al., 2016), so interventions often address these. Another goal of interventions is to foster cognitive development. Interventions often address executive functioning. Some specific skills include self-initiation, working memory, and following directions. The aim of interventions for ASD is to enhance quality of life and improve occupational functioning (Tanner, Hand, O'Toole, & Lane, 2015).

The Effects of Physical Activity

Researchers have recommended that children with autism take part in games and physical activities because they are essential in cognitive development, social communication, motor development, and emotional maturation for children (Yanardağ, et al., 2011). Physical activity and exercise are an important component of maintaining a healthy lifestyle for children, including those with ASD (Yanardağ, et al.; Konukman, Yilmaz, Yanardağ, & Yu, 2017). The benefits of physical activity on the development of children with ASD have been identified as the reduction of stereotypic behaviors, increases in appropriate behaviors, and improvement of social skills (Konukman, et al., 2017).

Pan and Frey (2006) identify that disparities in physical activity options between children with and without disabilities occur because of access to extracurricular activities. Children with ASD often don't have access to physical activity programs or other opportunities to be active for reasons related to their disability, so they are not afforded the same opportunities to be active as children without disabilities are (Pan & Frey, 2006). Must, Phillips, Carol, and Bandini (2015)

highlight other barriers to physical activity children with ASD experience. Some child-level barriers they identify include limited motor, social, and communication skills that affect their participation in physical activity. There are other peer, family, and community barriers that are present. These include not having an exercise partner close in age, parents having competing interests and commitments, not having transportation, and having limited opportunities to participate in physical activity programs (Must, Phillips, Carol, & Bandini, 2015).

One study sought to examine the impact of physical activity intervention on the physical and cognitive outcomes in children with autism spectrum disorder (Pan, et al., 2017). The intervention they designed consisted of five main activities, which included a warm-up activity, motor skills activity, a specific type of motor skill training related to executive functioning, group games, and a cool-down activity. The second and third activities were the main activities of the intervention and they were designed with the intention to target increasing the child's motor skills and executive functioning. The physical activity chosen in this study was table tennis, so the motor skills taught included hand bounce, racquet bounce, footwork movement, body control, balance training, and hand-eye coordination. The motor skills related to executive functioning focused on inhibitory control and attention. The results from this study showed increased table tennis motor skill proficiency and these improvements in motor skills may positively influence the overall functioning of children with ASD. Pan et al. (2017) note that motor skill training in which the steps are "goal-directed, structured, progressive, and interrelated may account for significant improvements in motor skills" (p. 195). This study also found that physical exercise had benefits in promoting increased executive functioning. These researchers found evidence that physical activity is beneficial for children with ASD because it increases

motor and cognitive skills, which are two areas in which children with this diagnosis experience deficits (Pan et al., 2017)

Another study investigated the effects of a structured physical activity program on social interaction and communication on children with autism. Zhao and Chen (2018) highlight the importance of physical activity and the benefits it has on social interaction and communication skills. This study shows how physical activity allows children with ASD to develop important interpersonal skills by experiencing a fun physical activity. This intervention consisted of four components, which included warm-up activities, one-to-five small group instruction, whole-group exercise, and cool-down and reward activities. After this 12-week structured physical activity program, researchers concluded that the participants showed significant improvements in social interactions, cooperation, and self-control. The social skills they found improved consisted of eye contact, group participation, and relationship-building with teachers and other participants. Zhao and Chen (2018) also found that participants' communication improved because the children in the experimental group verbally reacted to teachers and peers and they maintained eye contact when talking to someone else. This study provides insight to the positive effects of a physical activity program, specialized for children with autism, on their social and communication skill development.

Social interactions and Participation in Play

Because children experience deficits in social communication, it results in significant deficits in their ability to initiate and respond to other children (Morrier & Ziegler, 2018). Social participation and participation in play activities help improve social skills of children with ASD.

Smith and Puymbroeck (2011) conducted a pilot study to examine the effectiveness of the *Active Participation and Social Integration* (APASI) model on increasing active participation of children with ASD in recreation activities. The APASI model was originally designed for recreation therapists to be used for successful social integration of children with ASD (Smith & Puymbroeck, 2011). The main concept of this model is integration, and the focus is making children with autism truly part of the group by including them as active participants. This is accomplished by three constructs. The first is acceptance, where the children with autism are considered socially preferred members of the group. The second is visibility, which means the children with autism make a social impact on the group. And the third is group membership, in which the children with autism experience social affiliation within the group. Smith and Puymbroeck (2011) identify the specific purpose of their pilot study as determining if children with autism become more active participants in recreation activities after participating in an intervention designed using the APASI model. The participants consisted of two 9-year-old boys and one 10-year-old boy diagnosed with ASD. The specific intervention in this study was designed around the recreation activity of rock climbing, after the boys were offered with six available community-based recreation activities. The intervention followed the APASI model. Participants were first taught the specific skills needed to climb and the social requirements involved. Next, the therapist participated in the rock-climbing activity with the child. And lastly, the child participated invited five peers to participate in the activity with them. As a result of the intervention, researchers noted that from pre-intervention to post-intervention, off-task behaviors decreased, and on-task behaviors increased. These changes in behavior can be explained by the idea that the child was taught how to perform the activity before trying to do it. This study provides insight into the idea that teaching a child an activity before they engage in it, based on

the APASI model, could increase their skill competence and successful participation (Smith & Puymbroeck, 2011).

Play as Intervention

Play has an important and primary role in childhood and adolescence, as it can be considered one of a child's main occupations. The occupation of play for children includes "the development of skills, the expression of who they are, and the role of player when they engage with others in meaningful interactions" (Stagnitti, O'Connor, & Sheppard, 2012, p. 302). During play, children learn and develop important motor, cognitive, and social skills that are needed throughout life (Román-Oyola, et. al, 2018). Engaging in play also provides opportunities for children to develop language skills, social competence, motor abilities, and emotional control (Miltenberger & Charlop, 2014). "Interventions addressing social participation, restricted and repetitive behaviors, play, and leisure are likely to enhance the quality of occupational engagement for people with ASD" (Tanner, Hand, O'Toole, & Lane, 2015, p. 2).

Children with ASD often experience difficulties engaging appropriately with same-age peers, especially in unstructured environments. One study sought to explore the effects of structuring outdoor recess on increasing social interactions between children with and without ASD. Morrier and Ziegler (2018) identified that the specific purpose of their study was to design and implement a structured outdoor play curriculum to determine if the social behaviors and interactions between children with and without ASD changed as a result of the curriculum they developed. This study's participants included ten preschool-aged children with ASD and twenty-five of their typically developing peers. The intervention they implemented was referred to as *The Buddy Game*. This game included pairing up a child with ASD with one of his or her peers without ASD. The pair sang songs with gestures and movements in front of one another during

recess. The specific behaviors that the researchers recorded were proximity to peers, overall frequency of social interactions received from peers, and overall frequency of social interactions initiated to peers. Data was collected during baseline, intervention, and free play after *The Buddy Game*. The results from this study demonstrate that structuring peer interactions during unstructured situations has a positive influence on their social behaviors, as the social interactions increased between peers with and without ASD. *The Buddy Game* resulted in children with and without ASD displaying higher frequencies of receiving and initiating social interactions during the free play time after intervention. The results of this study indicate that such interventions are generalizable to different time and setting without the direct instruction from their teachers (Morrier & Ziegler, 2018).

Stagnitti, O'Connor, and Sheppard (2012) sought to investigate the change in the relationship between play, language, and social skills of children before and after participating in the *Learn to Play* program. The *Learn to Play* program is “a child led play-based intervention aimed at developing self-initiated pretend play skills in children” (p. 302). There were 19 participants in this study who all attended a specialist school. 10 of the 19 children were diagnosed with autism. The intervention aimed at improving the children’s play ability and their play interactions with other children. The *Learn to Play* program showed significant effects on these children. The results of the study indicate that this program increased the children’s social interactions, increased their language, and decreased their social disconnection over a 6-month period within their special school setting (Stagnitti, O'Connor, & Sheppard, 2012).

Bernard-Opitz, Ing, and Kong (2004) conducted a pilot study that compared the traditional behavioral approaches and natural play interventions for children with ASD. Early behavioral interventions have found to be effective in facilitating the development of children

diagnosed with autism. These researchers used a crossover design, where children participated in behavioral intervention for four weeks and play intervention for four weeks. They used counterbalancing procedures, which meant four children were first exposed to behavioral intervention and then to play intervention, while the other four children were exposed to these interventions in reverse order. Behavioral interventions followed the discrete trial training methods and the play interventions followed the paradigm of natural play. The differences between the intervention conditions are shown in Table 1 (Bernard-Opitz, Ing, & Kong, 2004). Both behavioral and play interventions resulted in improvements in play, attention, compliance, and communication among children. More than half of the parents reported improved communicative skills of their children at home. Participants in this study also showed a decline in their autistic symptoms. This study highlights how behavioral interventions and play interventions can be beneficial for children with autism in improving communication and interaction skills and decreasing the severity of their symptoms related to their diagnosis of ASD (Bernard-Opitz, Ing, & Kong, 2004).

Table 1

Teaching features used predominantly in behavioral and play conditions

<u>Predominant teaching format</u>	<u>Discrete trial format</u>	<u>Natural language paradigm, play</u>
Learning context	Table-type activities	Natural play
Stimulus items	Objects, pictures, actions	Toys, actions
Reinforcers	Natural and artificial	Natural
Teaching flexibility	Prescriptive	Flexible
Teaching approach	Adult directed	Child-centered

Researchers have investigated athletic group play in children with autism. Children diagnosed with ASD exhibit motor deficits that could impact their athletic abilities (Miltenberger & Charlop, 2014) and their capability to participate in athletic games. Increasing a child's ability to successfully participate in athletic group games could also help them develop other important skills. Miltenberger and Charlop (2014) sought to extend further research about athletic play. These researchers assessed the effects of an intervention designed to teach children with autism to play two specific athletic group games, which were handball and 4-square. The intervention consisted of two components, including athletic skills training and rules training. The sample size of this study was small, with only three participants, but all three children increased their group play, showed improvement in speech, and mastered the targeted athletic skills. This study was designed "to demonstrate that achieving basic motor skills and rules training increased the appropriate group play of children with autism" (p. 52), and the results indicated that it did.

Summary

A diagnosis of autism spectrum disorder (ASD) is characterized by deficits in social, motor, and cognitive functioning. When children experience significant deficits in these areas, their participation in certain activities and interactions becomes limited. The challenges in social communication and interactions can interfere with their ability to initiate and respond to their peers (Morrier & Ziegler, 2018). Children with ASD also exhibit motor skill impairments and deficits (Pan et al., 2017). Most interventions primarily focus on developing social, communication, and behavioral skills, while developing motor skills is sometimes overlooked. It is crucial that children have opportunities to develop in these domains, so they don't fall behind their typically developing peers.

Play interventions have been found to be effective in fostering social interactions and developing social communication skills. Play interventions involving physical activity have been found to improve fine and gross motor skills, coordination, and specific skills from the chosen intervention activities. Researchers have identified barriers to physical activity that children with ASD experience. Some of these barriers include limited access to resources for physical activity because of quality or location of them, limited opportunities for play in school and in sports, and often an absence of parental encouragement (Must et al., 2015). Upon review of the literature, it is evident that children with ASD are not offered enough opportunities that will help them develop their social, motor, and cognitive abilities in a structured setting. This program offers a potential resolution to that problem. The study design showcases an exclusive soccer program for children with ASD that contains elements that help afford these children the opportunity to thrive in a structured play environment.

Program Description and Rationale

This structured group soccer program was developed using an evidence-based approach. The author followed the four-step model for evidence-based process change, which includes identify the need for change, develop a proposal for change, implement change proposal, and evaluate extent and results of change (Harris, et al., 2015). The need for change was determined from reviewing literature and identifying that children with autism are not afforded enough opportunities to engage in structured play. The literature also highlighted that there are limited physical activity options for children with ASD when compared to their typically developing peers (Pan & Frey, 2006). The program serves as the proposal for change. It was developed based on the developmental frame of reference, a review of the associated literature, and the prior soccer experience and knowledge of the developer of the program. These three elements

were combined to determine which occupational areas the chosen activities needed to address, and which activities were appropriate for children with autism in the specific age range of the program participants. Actual implementation and evaluation of the proposal were not completed due to pragmatics, specifically the limited timeline of completing the project. The following sections break down the development of the soccer program, including the factors that influenced program development and a detailed description of the program itself.

Factors Influencing Program Development

Developmental Frame of Reference

Frames of references are used by occupational therapists to guide both evaluation and intervention, and they can be used to view an individual's functional capacity and behaviors. This structured group soccer program was designed based on the developmental frame of reference. The developmental frame of reference highlights how individuals develop in a generally predictable sequence. Developmental stages tend to be predictive and progressive. Using this frame of reference, the program was created to address the developmental difficulties and delays that children with ASD experience when compared to their typically developing peers. Those main delays tend to be in social communication, motor skill acquisition, and cognitive processing skills.

Following the typical developmental sequence, most young children will naturally engage in play because it is one of their primary occupations. It is through play that children acquire certain developmental characteristics and skills while interacting with their peers and the play materials (Jung & Sainato, 2013). Children with autism often do not engage in appropriate play, especially with their peers. Because of this, they often lack the opportunity to acquire

critical developmental skills that generally happen naturally for other children. This program provides opportunities for peer interaction, the acquisition of appropriate play and soccer skills, and other developmental skills. The type of play embodied through this program is structured group play.

Review of the Literature

This program was developed with an emphasis on the findings within the literature review. First, the soccer program was designed based on recommendations for children with ASD, including implementation of structure and routine, benefits of physical activity and exercise, engagement in sports programs, and benefits of participation in play. The soccer program provides a structured group environment exclusively for children with ASD that involves engagement in physical activity. Second, the components of the program were designed specifically to address motor, social, and cognitive difficulties highlighted in the literature. The physical activities of running, kicking, passing, and shooting address the development of coordination, bilateral coordination, locomotor skills, body awareness, and spatial awareness. This program includes aspects of a psychomotor intervention program (PIP), which can be beneficial in improving body awareness for children with ASD (ElGarhy & Liu, 2016). The key themes of PIP are body and space awareness, movement flow, and the interaction and recollection of the forces of movements. The aims of PIP are to create a safe environment and situations to develop social skills, which will help children build strong self-esteem (ElGarhy & Lui, 2016). The soccer program affords these children the opportunity to learn about their body movement and body awareness in relation to their peers, while providing social interactions.

Program Developer as a Subject Expert

The third aspect that helped design the program was the soccer knowledge and experience of the author. The author played soccer throughout elementary school, high school, and college. The author also has experience in coaching young children. She has developed and executed practice plans, where she served as the head coach during those practices. The children she coached ranged in ages 5 to 13. This coaching experience, soccer knowledge, and playing experience were used to choose activities and drills that would be applicable to this age group. The soccer activities are passing, shooting, and dribbling. These activities are the main soccer skill activities in the program, and they will help children learn and practice some of the basic soccer skills.

Program Description

The program was designed for each session to last for an hour and a half. The sessions include warm-up activities, specific soccer skill activities, and cool-down activities. The warm-up activities include the welcome, agility ladder, running time, and red light/green light game. The welcome was designed to initiate the beginning of the session and introduce the group leader and other volunteers. The group leader shows the schedule for the day and explains that each activity will be checked off after it is completed. The schedule has words and pictures to serve as a visual representation for the children to see. This schedule offers routine and structure, so the children get used to following the same schedule and they learn what activity comes next. The use of the schedule also helps to establish familiarity with the routine. The agility ladder focuses on bilateral coordination and body awareness. The running helps develop motor skills and incorporates physical activity and exercise into the program. The red light/green light game begins to develop cognitive skills, including listening/paying attention, following directions, and self-initiation. These activities all include aspects that help foster social interactions, where the

children can work on social communication skills. The soccer skill activities help develop balance and coordination, communication skills, sequencing of activities, and following directions. These are also physical activities that involve exercise and getting the heart rate up. After the soccer skills activities, the group leader takes the children through two cool-down activities, which include the game Simon Says and then the goodbye. Simon Says is a fun game to end the session with, and it also directly address cognitive skills. The children have to focus on what the group leader says and follow the directions to stay in the game. The goodbye activity serves as a wrap-up of the session and the group leader will show that all the activities on the schedule have been checked off, so it is time for the session to end.

Group Protocol

Group Title: Kicks for Kids

Author: Lydia Lawson, OTS

Time/frequency/length of group: This group program lasts for a duration of six weeks and meets twice a week on Tuesday and Thursday nights from 6:00-7:30 PM, for a total of twelve sessions.

Group membership and size: This group is designed exclusively for children diagnosed with autism spectrum disorder (ASD). The program allows for approximately 15-20 children, with one main group leader and Elizabethtown College student volunteers from both the men's and women's soccer teams. There must always be more volunteers than children at every group session. Each volunteer will be paired with one child and serve as their 'buddy'.

Group setting/location: This group takes place at the Greater Elizabethtown Area Recreation Services (GEARS) Community Center in Elizabethtown, Pennsylvania. The group takes place in the indoor gymnasium.

Group funding/costs: The cost to attend the program is \$100. This fee goes toward the cost of obtaining clearances for volunteers, associated costs of supplies, and cost to utilize the space.

Criteria for Eligibility: The program is open to children diagnosed with ASD. Children must be between the ages of 4-8. Volunteers must be Elizabethtown College students and have the necessary clearances to work with children (Child Abuse, PA State Police, fingerprinting). These volunteers will be trained before the start of the program. They will attend an hour-long training session led by the primary group leader, and the training will consist of education about an autism diagnosis, how to interact with these young children, and what their responsibilities are going to be throughout the sessions.

Exclusion Criteria: Children who can not follow one-step directions will be excluded from the program. Children who display violent or injurious behaviors toward themselves or others will also be excluded.

Frame of reference or model: This group is designed based on the Developmental frame of reference. Through the developmental frame of reference, this program was designed to address delays in motor, social, and cognitive skills.

Group purpose: The purpose of this group is to provide an opportunity for children with ASD to participate in structured group play. Participation in group play helps with developing motor and social skills, increasing social interactions, and providing cognitive stimulation. This structured group soccer program incorporates routine activities designed to help children develop

motor, social, and cognitive skills. Motor development focuses on locomotor skills, including running and coordination, and soccer skills, specifically kicking, shooting, and dribbling. The group aspect provides an environment to enhance social skills and social participation. The specific cognitive skills include following directions, sequencing, self-initiation, and self-regulation.

Group goals and objectives:

- Participate in warm-up, cool-down, and soccer skills activities
- Improve basic soccer skills, including passing, shooting, and dribbling
- Develop and improve motor skills
- Engage with group leaders and other group members
- Follow directions set in place by group leaders

Group member expectations: The group members will attend both weekly sessions for twelve weeks. The expectations for the members while they are in attendance at group sessions include participating in all activities within the hour, engaging with group leaders and other children, and follow the sequence of activities within the session schedule.

Leadership Roles: The group is led by the primary group leader, an occupational therapy student from Elizabethtown College. The group is also led by volunteer Elizabethtown College student-athletes from both the men's and women's soccer teams. The role of the primary group leader is to delegate responsibilities to the volunteers and make sure each child has at least one volunteer specifically buddied up with them. The group leader is responsible for using the schedule to transition from one activity to the next.

Supplies: The supplies include two agility ladders, cones (at least 10), soccer balls (at least 20), two small soccer nets, the red and green signs (see picture below), and a printed-out version of the schedule (found in Appendix A), preferably on a big poster board if possible.

Measuring outcomes: Player outcomes will be measured by a parent satisfaction questionnaire. The questionnaire will be used to gauge the parental opinions regarding their child's experience and improvement of motor, social, and cognitive skills. This questionnaire was developed by the program author.

Session Outline

Warm-up activities:

1. Welcome

- The group leader instructs all children to come to the middle of the gym for welcome time. The group leader will welcome everyone and show the children the schedule for the day.

2. Agility ladder

- The children will stand in a line behind the ladder and the group leader will instruct each child to walk through the ladder and then run through the ladder four times each.
- Rationale: Walking and running through the agility ladder will help with body awareness, as each child will have to look where they are stepping and move their feet in and out of each ladder section. It also addresses bilateral coordination.



- Drink Break

3. Running Time (Jogging up and back full length of gym)

- Children will spread out along one end of the gym and the group leader will tell the children it is running time. The group leader will encourage them to jog up and back a few times. Children may be split into two groups if necessary.
- Rationale: This warm-up activity is to get their heart rates up and to start incorporating physical activity into the session. This activity aims to develop locomotor skills, such as running. This running activity also helps develop bilateral coordination and spatial awareness in relation to the other children running next to them.

4. Red light/Green light Game

- The group leader will tell the children green means ‘go’ and red means ‘stop.’
- When the group leader holds up the green paper and yells, “Go!” the children will begin running, and when the group leader holds up the red paper and yells, “Stop!” the children must freeze.
- Rationale: This activity is structured and provides the children with visual and auditory cues to follow. This activity address cognitive skills, as the children need to follow directions and then initiate the tasks of running or stopping.



Soccer Activities:

1. Passing

- The children will break up into 4 groups. Two groups will line up approximately 10 feet apart from one another. One child will pass to another child standing in the line across from them and then return to the back of their line. This pattern will continue, so they kids are passing the ball back and forth.

- Instruct the children to say, “Here” or “Pass to me” when it is their turn to receive a pass. The volunteers can help prompt the children to say these things.
- Rationale: This activity is to work on the soccer skill of kicking/passing the ball, the motor skills of balance, bilateral coordination, and social communication with other peers. This also address the cognitive skill of following directions.

- Drink Break

2. Shooting

- There will be two goals available at each end of the gym. There will be 2 cones set up about 10 feet away from the goal about 10 feet apart. The children will split in half and each half will go to one or the other goal. They will line up behind the set of cones about 10 feet from the goal. One college volunteer will set the ball up between the cones, and one child will shoot the ball toward/into the net. There will be another volunteer responsible for gathering the balls from the net to continue being set up for the kids to shoot.
- Rationale: This activity works on soccer shooting skills. It also addresses the motor skill of bilateral coordination and again, the cognitive skill of following directions.

3. Dribbling

- The group leader and volunteers will set up 4 or 5 sets of cones in a line about 20 feet apart. The children will break out into even groups and line up behind one side of the sets of cones. Each line will have a ball. The children will take turns dribbling to their opposite cone and coming back in a relay fashion. Each child will be able to go a few times. If there is time, the last one can be a race.

- Rationale: This activity works on dribbling skills and again, addresses motor and cognitive skills.

Cool-down activities:

1. Simon Says

- The group leader will act as Simon. The group leader will explain the rules to the kids, and they will do a practice round. The second and third rounds could be elimination rounds, so the children have an incentive/reward for listening and following directions.
- Rationale: This activity directly addresses the cognitive skills of following directions and self-initiation of doing whatever Simon says to do. It increases their interactions with the group leader and helps the children focus on the main leader and what they are saying.

2. Goodbye

- The group leader will again instruct all the kids to return to the middle of the gym and sit down. The group leader will say goodbye, thank everyone for coming, and tell say we will see you next time. The group leader will hold up the schedule and show that they checked every box, so the schedule is complete, and it is time for them to go home.

Notes:

- Each session is planned to be the same but upgrading and downgrading might be necessary after determining the functional abilities of the participants and the needs of the group.

- The reasoning for the sessions being the same is to create a sense of familiarity and create a routine for group members.
- Each child will always be paired up with a college volunteer ‘buddy,’ so their ‘buddy’ can help them stay on task and follow directions
- After each part of the schedule is completed, the group leader will show the kids and put a check mark in the box on the right, so the kids know they are moving on to the next thing (This is important to maintain structure and routine)
- The volunteers will help keep the activities organized and be responsible for gathering materials and setting up cones/goals
- The times on the schedule are subject to change and are flexible if one activity takes longer than the others.
- The volunteers will always wear blue shirts, so the children know who the ‘buddies’ are.

Discussion

The literature highlights that the number of children with autism worldwide is growing at a dramatic pace (Zhao & Chen, 2018). The increase of children with ASD emphasizes the need for the number of treatments, interventions, and resources available to them that will help improve developmental skills, including social, communication, motor, and cognitive skills. Researchers believe that activity-oriented interventions can help develop these skills and increase occupational performance in daily environments (Zhao & Chen, 2018). The study design offers an activity-oriented structured soccer program. The purpose of the soccer program is to provide children with ASD an exclusive opportunity to participate in a structured group play environment, which was specifically designed to develop motor, social, and cognitive skills through multiple session activities.

Children with ASD often experience limited opportunities to participate in physical activities (Zhao & Chen, 2018), and this can be partially described by the model of disability, which highlights that lower levels of physical activity result from the failure of society to provide appropriate services and access to community and education physical activity opportunities (Pan & Frey, 2006). The program was designed with an emphasis on the inclusion of physical activities because there are great benefits to physical activity, especially for children with ASD. Physical activity contributes to healthy development, improves an individual's physical condition, helps establish a positive lifestyle, and improves self-esteem, social skills, and behavior (Zhao & Chen, 2018). Physical activity has also been found to reduce restricted patterns of behaviors that are seen in children with ASD and improve more appropriate behaviors (Konukman, et al., 2017).

Play is the primary occupation of children and is an essential opportunity for peer interaction (Roman-Oyola, et al., 2018). Children with ASD experience difficulties engaging in social interactions with peers. These children often lack language skills and the ability to initiate and engage in meaningful interactions. These interactions are especially limited in unstructured environments. Structured play environments offer children the ability to engage with peers and practice utilizing communication skills. Being in a group setting provides an environment for social interactions.

This program was designed with an emphasis on physical activity and structured group play. Offering community programs exclusively for children with ASD will provide them with a platform to develop skills that can be applied in their natural environments. Fostering opportunities to develop social, motor, and cognitive skills will greatly improve occupational performance in children with ASD.

Limitations

There are some limitations of the designed program. The first limitation is that the autism spectrum is very broad; therefore, participants will have significantly different levels of functioning and abilities. The difference in abilities could pose as a limitation because some members might not be able to do some of the activities, while some activities may be too easy for others. Children with ASD often experience significant motor incoordination and present with low muscle tone, which might make the activities of running and balancing for the soccer skill activities particularly challenging. In addition to the differing levels of functional abilities, these children will have different sensitivity thresholds. With all the children and student volunteers in one gym, there is a possibility for children to become overloaded, which would affect their participation. Second, the program relies heavily on college student volunteers to ensure that each child is paired up with a ‘buddy’ to help keep them on task and engaged in activities. Relying on volunteerism might result in less participation because they are not required to be there. This would put the group leader at a disadvantage and make it harder to keep all children engaged in the session. Another limitation is that there is a cost required to participate in the program, and this might limit the number of children who sign up. Another limitation is that the group meets twice a week. This might cause children to miss a session for reasons such as any prior commitments, parental work or schedule conflicts, or unavailability of regular transportation.

Recommendations

For future planning and implementation, group leader will follow the group protocol and session outline. Changes can be made where necessary, but the core components of the protocol should remain the same. Session outline can be upgraded or downgraded based on the group

needs and abilities. The parent satisfaction questionnaire should be administered to parents during the last week of sessions. The results of the questionnaire will be used to determine the effectiveness of the program and parent satisfaction. Those results can be used to make appropriate changes to the program protocol or session outline where necessary.

Conclusions & Implications for Occupational Therapy Practice

The aim of this study was to develop a program for children with ASD that was related to acquiring social, motor, and cognitive developmental skills. The program itself contains a variety of activities and is designed to be implemented and delivered over a six-week period with a total of twelve sessions. Each session is designed to be the same to establish a sense of familiarity and create structure and routine for the group members. The goals of the soccer program are to participate in group activities, develop motor, social, and cognitive skills, engage with peers and group leaders, and develop basic soccer skills. The achievement of these goals will be measured by a parent satisfaction questionnaire. This satisfaction questionnaire will be administered to parents during the last week of the program. The results from the questionnaire will be used to determine the success of the program and the parental opinions regarding the implementation of the program.

OT Practice Application

Occupational therapists are primarily concerned with optimizing the occupational performance of individuals. When thinking about the implications for occupational therapy practice, it is important for therapists to provide interventions that address deficits in performance for children with ASD. These primary deficits include social, motor, and cognitive developmental deficits. Therapists must provide treatment activities and interventions that aim to

develop these skills. It is important for an occupational therapy student to run this specific group program because of the knowledge about an autism diagnosis and implementing interventions designed specifically for this population. An OT student has been educated on the developmental deficits that children with ASD experience and what those might look like. OT students also understand the benefits of providing intervention and activities designed to increase functional abilities. In addition, OT students also know how to upgrade and downgrade activities based on an individual's needs and abilities. An OT student can adapt and use clinical reasoning to change the activities when necessary to help optimize functioning for each child, and to determine the 'just right challenge'. The 'just right challenge' refers to providing activities or interventions that put the right amount of demand on an individual, which means he or she can still experience success while being challenged to do so. The chosen activities need to be appropriate and reasonable for an individual's abilities.

It is also important for therapists to provide their clients with information about resources available to them that could be explored in addition to occupational therapy. The study design offers a soccer program designed through the developmental frame of reference with a focus on activities that contribute to developing social, motor, and cognitive skills. The group program was designed by an occupational therapy student with knowledge about implementing interventions that are age-appropriate and developmentally appropriate. This program will be a community resource available for children in the area whose parents are interested in their children attending an exclusive soccer program that will aid in their development of social, motor, and cognitive skills, and specific basic soccer skills.

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Agility ladder picture: <https://mahalo4life.com.au/fitness-equipment/372-pro-8m-speed-agility-ladder-16-rung.html>

Red/Green light picture: <https://camillesprimaryideas.com/2016/09/road-trip-review-word-city.html>

Appendix A

Daily Schedule

6:00 – 6:10	Welcome 	
	Find buddies 	
6:10 – 6:15	Agility Ladder 	
6:15 – 6:20	Drink break 	
6:20 – 6:25	Running Time 	
6:25 – 6:35	Red light/Green light 	
6:35 – 6:45	Kicking 	
6:45 – 6:50	Drink break 	
6:50 – 7:00	Shooting 	
7:00 – 7:15	Dribbling 	
7:15 – 7:25	Simon Says  	
7:25 – 7:30	Goodbye 	

Appendix B

Parent Satisfaction Questionnaire

Child's Name: _____

Parent's Name: _____

Phone Number: _____

Please answer the following questions on a 5 point-likert scale regarding the soccer program itself and questions related to your child's experience from the program. Check the box that most applies.

Your answers will be used to gauge the effectiveness of the program and determine overall parental satisfaction.

	Strongly agree (5)	Agree (4)	Neutral or unsure (3)	Disagree (2)	Strongly disagree (1)
My child enjoyed this program					
This program was beneficial for my child					
My child improved motor skills (running, jumping)					
My child improved social skills (increased interactions and engagements)					
My child improved cognitive skills (following directions, self-initiation)					
My child received individualized attention and instruction					
I was satisfied with this program overall					
I was satisfied with the group leaders					
I was satisfied with the college volunteers					
This program was well-organized and structured					
I would recommend this program to another parent					
Additional comments/suggestions:					

Signature: _____