

Improving Social Skills of Adults With Autism Spectrum Disorder Through Physical Activity, Sports, and Games: A Review of the Literature

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Socialization skill deficiencies among adults with autism spectrum disorder (ASD) can lead to depression, anxiety, aggression, and physical health problems. Clinical interventions must treat primary deficiencies and prevent secondary conditions. A treatment model emphasizing the integration of physical activity with social intervention strategies for adults with ASD is proposed.

Keywords: autism spectrum disorder, adults, physical activity

Socialization skills are a primary predictor of one's future success and livelihood. Unfortunately, adults suffering from autism spectrum disorder (ASD) are severely deficient in such socialization skills. Deficient socialization skills can lead to several secondary conditions for individuals with ASD, including depression, anxiety, and aggression (Bellini & Hopf, 2007; Laugeson, Frankel, Mogil, & Dillon, 2009), and physical health problems such as obesity (Rimmer, Yamaki, Lowry, Wang, & Vogel, 2010; Ward, Nichols, & Freedman, 2010). Further compounding this condition is the transition into adulthood for individuals with ASD. As a result, deficient social skills may lead to poor educational outcomes, low employment rates, and health care inequality for persons with ASD and can ultimately create significant economic challenges to caregivers and the public health system (Taylor & Mailick, 2013; Taylor & Seltzer, 2011; Ward et al., 2010).

Initial findings have supported ASD persons' participation in group physical activity, sports, and games to improve their socialization skills, as well as to reduce the secondary conditions mentioned (Alexander, Dummer, Smeltzer, & Denton, 2011; Findlay & Coplan, 2008). Participating in group physical activity is cost effective, promotes community integration, and is a behavior that can be learned and maintained throughout a lifetime to ensure lasting results on social skills. However, despite these findings, physical activity is often overlooked in the treatment of social skills. Moreover, much of the research on treatment that has included some form of physical activity has been limited to children and adolescents (e.g., De, Small, & Baur, 2008; Schultheis, Boswell,

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& Decker, 2000; Simpson, 2005). The literature on the use of physical activity with adults having ASD is nearly absent.

To address these gaps in the literature, I propose a treatment model that integrates group physical activity with social intervention strategies that can be used to promote socialization skills and to prevent secondary conditions related to socialization skill deficiencies among adults with ASD. Specifically, the proposed treatment model recommends incorporating the structure from the Success in Physical Activity model (SPA), a model based on the Treatment and Education of Autistic and Related Communications–Handicapped Children (TEACCH) program that has had initial success in promoting physical activity among individuals with ASD (Schultheis et al., 2000). In addition, the proposed model recommends incorporating social intervention techniques, which include priming, peer response training, and self-monitoring/self-management.

ASD is characterized by social skill deficiencies, including social interaction and communication deficits and restrictive and/or repetitive patterns of behaviors, activities, and/or interests (American Psychiatric Association, 2013). As noted by Herbrecht et al. (2009), the core deficiency of those with ASD revolves around socialization skills, which can have a major effect on ASD persons' interpersonal functioning and lead to significant challenges with regard to them achieving a full and satisfying life.

According to Autism Speaks (2014), ASD is the fastest-growing developmental disability in the United States. The Centers for Disease Control and Prevention (CDC; 2012) reported that one in 88 children from all racial, ethnic, and socioeconomic groups has ASD. The CDC (2008) also estimated a 78% prevalence increase in ASD from 2002 to 2008.

ASD is a highly complicated disorder, and its precise cause, methods for prevention, and cure are unknown. In addition, there are no biological markers or medical tests to identify ASD, which means that counselors must rely heavily on the behavioral observations of parents, caregivers, and teachers. Consistent with the diagnostic criteria, these observations typically include substantial impairments in socialization skills. As socialization problems continue to be evident and not treated, other secondary problems can emerge such as feelings of misunderstanding, isolation, social anxiety, depression, low self-esteem, lack of friendships, and poor academic performance (Bellini & Hopf, 2007; Laugeson et al., 2009). Furthermore, deficient social skills can increase the risk of bullying victimization and behavioral problems such as tantrums, physical aggression, pica, and self-abuse (Matson, Sipes, Fodstad, & Fitzgerald, 2011). As individuals transition into adulthood, challenges may become even greater. In fact, the results of a 10-year longitudinal study of adults with ASD indicated significant declines in independence and engagement in educational and/or vocational activities over the follow-up period (Taylor & Mailick, 2013). In addition, greater independence in vocational activities was correlated with greater independence in activities of daily living. To provide a context for understanding the unique secondary conditions related to adults with ASD, I review three of the major challenges they face: education and employment-related challenges, health challenges, and economic challenges.

EDUCATION AND EMPLOYMENT-RELATED CHALLENGES

As the problems stemming from deficient socialization skills advance, individuals with ASD may fail to graduate from school and/or successfully transition into employment. This may be partly due to the loss of structure and support associated with the exit from high school (Taylor & Mailick, 2013). Further compounding this issue is the improvements of ASD symptoms that have been shown to occur while adolescents with ASD are in high school, which often decrease or stop after high school (Taylor & Seltzer, 2011). Standifer (2012) noted that there is an actual increase in the rate of individuals with ASD graduating from high school; however, the employment rate for these individuals is only half that of all individuals with developmental disabilities. In fact, 35% of young adults ages 19–23 with ASD have not had a job or received postgraduate education after leaving high school (Shattuck et al., 2012). In 2009, it was estimated that 59% of young adults with developmental disabilities were employed, compared with only 33% of young adults with ASD (Standifer, 2012). Those who are employed typically work part time in a sheltered workshop, earning low wages in comparison with other persons with developmental disabilities.

A significant part of this problem may be the lack of support systems offered to these individuals to effectively support their transition into adulthood. In fact, compared with youth with other disabilities, youth with ASD are more likely not to receive any formal services after exiting high school (Shattuck, Wagner, Narendorf, Sterzing, & Hensley, 2011). In addition, half of these youth have no vocational or educational activities in the years immediately following their high school exit (Shattuck et al., 2012). As a result, despite myriad efforts aimed at supporting adolescents with ASD, they are largely unsuccessful in transitioning from school to the workforce. This, in effect, further reinforces the social disintegration, health care inequality, and negative economic impacts people with ASD experience, thus justifying an increased need for effective social intervention programming.

HEALTH CHALLENGES

Adults with ASD may not have health care equality, including with regard to areas of access, quality, communication, and knowledge (Ward et al., 2010). First, those with ASD have difficulty accessing health care because they may be poor and/or insured with Medicaid, thus limiting their access to medical professionals who only accept Medicaid. In addition, because of a lack of general knowledge about the challenges faced by individuals with ASD, health care and other service providers may not market to this population or be trained to effectively serve them (Ward et al., 2010). In fact, a study found that 60% of nurses and health professionals received little to no education in the area of developmental disabilities, including ASD (Sanders et al., 2008). Unfortunately, a lack of awareness and knowledge of a population's needs caused by social disintegration can result in negative attitudes that may result in further

disintegration, stigma, and poor health care (Barr & Bracchitta, 2008). Further magnifying the health care disparities faced by adults with ASD is their lack of social and self-advocacy skills that would allow them to act on their own behalf to address these issues (Ward et al., 2010). Unfortunately, each of these issues contributes to the continued marginalization of this already highly discounted population by limiting their access to high-quality health care.

Without adequate health care, individuals with ASD continue to display higher rates of comorbid and chronic health conditions than the general population (Ward et al., 2010). These health conditions include heart disease, cancer, and secondary conditions such as gastrointestinal disturbances (Autism Speaks, 2014; Rimmer et al., 2010; Ward et al., 2010). Furthermore, individuals with ASD have a higher rate of obesity than the general population (De et al., 2008). In fact, adolescents with ASD have been found to have obesity rates two to three times higher than the general population (Rimmer et al., 2010). Unfortunately, obesity can contribute to additional health conditions, such as gastrointestinal problems, high blood pressure, high cholesterol, diabetes, depression, fatigue, liver or gall bladder problems, low self-esteem, preoccupation with weight, early maturation, and pressure sores (Rimmer et al. 2010). As this population ages and these problems are left untreated, the potential for harm only increases.

Health care inequality is not the only major factor contributing to this population's health epidemic. Medications prescribed to treat secondary conditions for those with ASD can cause side effects such as increased appetite and weight gain. In addition, individuals with ASD often have lifestyles characterized by reduced physical activity, which contributes to the significantly high rates of obesity among this population (De et al., 2008). A sedentary lifestyle can further limit an individual's opportunities for integration into the community, thus, further compounding the isolation so often associated with having ASD (Teychenne, Ball, & Salmon, 2010).

It is not difficult to see why individuals with ASD may face a perfect storm that further disenfranchises and creates tremendous challenges to achieve well-being. Indeed, their lack of social skills affects their effective transitioning from secondary education into the broader community. They face constant challenges from adolescence to adulthood, including those stemming from a lack of employment and/or underemployment, a lack of access to high-quality health care, and a risk of having a sedentary and isolated lifestyle, which can all combine to the long-term detriment of the individual and the economy.

ECONOMIC CHALLENGES

Further highlighting the national impact of ASD, it is estimated that the United States alone spends approximately \$250 billion annually on costs associated with ASD (Buescher, Zuleyha, Knapp, & Mandell, 2014). This figure includes research, insurance costs and noncovered expenses, Medicaid waivers for ASD, educational spending, housing, transportation, employment, and related thera-

peutic services and caregiver costs (Buescher et al., 2014). Whereas the economic challenges to the nation are indeed significant, the financial burden to families and/or caregivers may be untenable for many. According to the CDC's (2012) Autism and Developmental Monitoring Network, annual medical costs alone may range from \$2,100 to \$11,200 per individual with ASD—as much as six times higher than for individuals without ASD. Additionally, it is estimated that nonmedical costs for special education per individual averages approximately \$13,000 per year (Amendah, Grosse, Peacock, & Mandell, 2011). Furthermore, behavioral intervention–related costs are estimated at an annual additional \$40,000 to \$60,000 per individual with ASD (Amendah et al., 2011).

As a result of the significant needs of individuals with ASD, services and treatment options are in high demand, and waiting lists for these basic services are not uncommon. Unfortunately, caregivers may often need to stop working to meet the high demands of care and treatment needed by individuals with ASD (Kogan et al. 2008), resulting in a hardship for families and decrease in the work productivity of the community, which potentially increases family and community dependency on state and federal funds. Despite the enormous amounts of money now being spent on individuals with ASD and the progress that has been made to date, there is still much work needed given that adults with ASD continue to have deficient social skills and unmet treatment needs. This ultimately creates a negative long-term economic impact on families and society.

GROUP PHYSICAL ACTIVITY, SPORTS, AND GAMES IMPROVE SOCIAL SKILLS

Participation in group physical activity, sports, and games is one cost-effective method that has been found to improve socialization skills and social well-being in individuals with ASD (Findlay & Coplan, 2008). For example, such participation was found to improve assertiveness and self-control, as well as self-esteem related to physical ability and physical appearance (Findlay & Coplan, 2008). However, as previously noted, research in this area has been primarily limited to children and adolescents. As a result, this review focuses on the research that has been conducted on children and adolescents and the potential implications for the interventions to be used with adults.

For example, a 14-week study involving four participants in the Special Olympics was conducted, which taught social skills in a classroom combined with soccer activities. All participants engaged in this program developed, generalized, and maintained social skills, including eye contact and turn taking (Alexander et al., 2011). These skills were maintained 5 weeks postintervention. Although the study was extremely limited in the number of participants, the results suggest the potential use of such interventions with adults with ASD.

Evidence has also supported physical activity in increasing ASD persons' socially appropriate behaviors, attention spans, and on-task behavior while decreasing self-stimulating behaviors and other socially inappropriate behaviors (Kern, Koegel, & Dunlap, 1984; Powers, Thibadeau, & Rose, 1992; Rosenthal-Malek & Mitchell,

1997; Watters & Watters, 1980). As a result, the use of physical activity with adults having ASD may have particularly favorable implications as part of their preparation for employment and effectively working in an employment setting.

The integrative environment in which these activities occur presents an organized structure and framework that develops and fosters social skills and support, while providing security, rules, regulations, goals, and discipline. Simultaneously, the environment may provide a naturalistic, interactive experience for participants, as well as an opportunity for a greater number of peer contacts and experiences (Findlay & Coplan, 2008). Given that peer contact and interactions in sports occur naturally, interactions, skill maintenance, and generalization are promoted (Alexander et al., 2011). Such an environment also addresses and promotes the developmental need of social belonging—a key developmental issue for individuals that is only obtained through experience (Laursen & Yazdgerdi, 2012). Furthermore, it offers opportunities for increased social interaction through activities that can be unpredictable and intended to be enjoyed (Harper, Symon, & Frea, 2008; Laursen & Yazdgerdi, 2012). In addition, the environment may provide adults with new opportunities to experience a sense of mastery and accomplishment over themselves and the environment/activity, which again may translate to other aspects of their lives. These memories of mastery may then be leveraged in times of need, providing self-esteem and confidence. The environment may also motivate adults to challenge environmental barriers, avoid isolation, and seek community integration. Finally, such an environment may allow adults to experience various roles and types of interactions, thus further developing the social characteristics that help adults integrate into existing larger social structures (Kroeger, Schultz, & Newsom, 2007).

In addition to improving social skills, there is a wealth of evidence supporting the use of physical activity in treating anxiety, depression, anger, obesity, and other physical health problems, which are in fact secondary conditions for individuals with ASD. Participating in physical activities may also help eliminate a sedentary lifestyle, as well as combat the side effects of medications such as weight gain due to increased appetite. In fact, a study conducted by Pitetti, Rendoff, Grover, and Beets (2007) found that 10 adolescents with severe ASD were able to learn and complete a treadmill walking program, which incorporated increased speeds and incline settings throughout a 9-month period. The sessions progressed to 20-minute sessions five times per week, resulting in significant decreases in the adolescents' body mass indexes by the end of the study. Because of the potential risk of developing chronic health problems among adults with ASD resulting from long-term sedentary lifestyles, treatment interventions that include physical activity may not only be highly beneficial but also pertinent to ASD persons' long-term success and prosperity.

Another benefit of group physical activities, sports, and games is their ability to provide persons with an environment and opportunity to express creative motivations. As noted by Flaherty (2011), creative motivations are significant assets for persons with disabilities, including those with ASD, who may be diminished by medications they are often prescribed.

Finally, conducting activities in an integrative environment provides an opportunity for counselors to focus their attention on environmental factors that contribute to maladaptive behaviors, given that such factors are often overlooked once medication treatment has begun (Matson et al., 2011). Conducting activities in such an environment also provides an opportunity to implement behavioral management strategies to decrease or eliminate maladaptive behaviors and reinforce positive behaviors. Such social skills and behaviors, as well as environmental factors contributing to these skills, can be generalized to other settings.

SOCIAL SKILLS TRAINING METHODS

In addition to the body of knowledge related to the benefits of physical activity, there is growing empirical evidence supporting the use of social intervention strategies in improving the social skills of individuals with ASD. Many such interventions are derived from behavioral models (e.g., applied behavioral analysis), including peer response training, self-monitoring/self-management, and priming techniques. When these interventions are implemented together in a naturalistic setting with a flexible structure based on unique participant need and differences, they have the potential to produce effective results.

Peer Training

Peer training is a viable strategy for increasing interaction and teaching social skills to persons with ASD (Harper et al., 2008). Furthermore, peer training is consistent with the broader movement within the field from the use of adult-directed to peer-directed instructional strategies, including peer training, peer tutoring, and peer networking (Owen-DeSchryver, Carr, Cale, & Blakely-Smith, 2008). These peer-mediated strategies specifically focus on using typical students to improve the behaviors of students with ASD. Typical students are trained in prompting students with ASD to follow simple directions by imitating, engaging in turn taking, and verbally requesting items (Owen-DeSchryver et al., 2008). Peer training gives students with ASD opportunities to practice responses several times. More frequent initiations mean more practice and opportunities to perform initiations appropriately. In fact, a study found a significant increase in social interactions following a peer response training that was implemented during recess (Harper et al., 2008). The study used adult support in addition to peer training for children with severe ASD to provide enhanced support for children with more serious needs. The increases in social interactions were maintained at follow-up, thus demonstrating the long-term effects. It should be noted that the use of recess as the time for implementation was specifically emphasized as a natural setting, suggesting the ease at which such strategies can be integrated into everyday events.

Evidence from peer training studies has not only demonstrated improved social skills among children with ASD, but also improved interactions between non-ASD children with ASD children. In fact, Owen-DeSchryver et al. (2008) reported a significant increase in initiations by trained peers and nonparticipat-

ing peers toward children with ASD following the intervention. This finding has particular significance because it demonstrates the broader value of peer training—promoting increased interactions both by children with ASD to non-ASD peers and by non-ASD peers to children with ASD. As a result, increased integration of children with ASD is achieved in the school. In addition, it raises awareness and ultimately educates students and peers about ASD. From this study, one may hypothesize that the utilization of peer training for individuals with ASD in the community may result in their increased integration into the community. Unfortunately, few studies of peer training with adults have been conducted.

Self-Monitoring/Self-Management

Self-management is a technique designed to teach individuals with ASD to self-monitor and self-reinforce their behavior. Such behaviors are recorded by the participant using items such as a wrist counter, checklist, or tokens. Such an intervention supports fostering one's own ability to control actions by paying specific attention to particular behaviors and the immediate effects and results produced under certain conditions in specific environments (Loftin, Odom, & Lantz, 2008). As a result, individuals with ASD can become motivated to independently control their own behavior (Southall & Gast, 2011). Research on self-management has demonstrated its effect on improving such social skills as eye contact, turn taking during conversations, and appropriate verbal responses (Gear, Bobzien, Judge, & Raver, 2011). In addition, self-management has been successfully utilized in a group setting in teaching and improving social skills for an adult with Down syndrome (Gear et al., 2011). This study suggests that self-management may be successfully utilized in a group setting for adults with other developmental disabilities such as ASD.

Priming

Priming exposes one to an upcoming event before it occurs, thus making it more predictable (Scattone, 2007). It aims to teach individuals with ASD to initiate actions with peers and how to respond to initiations, as well as how to deliver reinforcing or prompting behavior. Following priming sessions, participants engage in activity sessions with the aid of prompts. Prompts are eventually faded out as participants increase independent spontaneous initiations. Two strategies to help facilitate the process of priming are written scripts and video modeling.

Written scripts have been used to assist children with ASD to interact more effectively. At the end of an activity, children are taught to follow-up with peers, initiating scripted questions such as, "Did you like the activity?" or "What did we do well?" or "What do we need to work on?" In a historic study (Krantz & McClannahan, 1993), unscripted initiations were observed and maintained at a 1-month follow-up without verbal prompts. Also, these initiations generalized to different peers, settings, activities, and teachers (Scattone, 2007).

Video modeling is another strategy that has resulted in improved social skills and initiations among those with ASD (e.g., Taber-Doughty, Patton, &

Brennan, 2008). This strategy requires participants to prepare for an upcoming event by watching videotaped demonstrations of skills to be performed. Participants then imitate the skills learned during the planned activity. The rationale of the strategy is to assist participants in learning through the basic process of imitation, as utilized in applied behavior analysis (Pierce & Cheney, 2008; Sancho, Sidener, Reeve, & Sidener, 2010). This intervention has been successful in teaching children with ASD a variety of social skills, including social initiations and imitation of play skills, as well as teaching children with ASD about the meaningfulness in social interaction and play. In fact, Taber-Doughty et al. (2008) found that children achieved target social skills through the methods of video modeling and simultaneous video modeling. Another study (Sancho et al., 2010) reinforced these findings, demonstrating the effectiveness of both types of video modeling in improving social skills of children with ASD. In addition to its use alone, video modeling has demonstrated efficacy when combined with self-management (Deitchman, Reeve, Reeve, & Progar, 2010).

The limitations discussed for current social intervention strategies include inconclusive data, small sample sizes, unblinded observer ratings, a lack of follow-up assessments, and a lack of unscripted initiations and verbalizations produced (Koenig, Reyes, Cicchetti, Scahill, & Klin, 2009; Rao, Beidel, & Murray, 2008; Sancho et al., 2010). Furthermore, results have not been generalized to community settings nor have they demonstrated maturation of improvement over time (Rao et al., 2008; Sancho et al., 2010).

COMBINING GROUP PHYSICAL ACTIVITY, SPORTS, AND GAMES WITH SOCIAL INTERVENTION STRATEGIES

Given that evidence clearly shows that individuals with ASD learn differently, one must adapt both teaching style and environment to better meet the needs of this population, supporting individuals with ASD in a structured yet natural setting at intense, repetitious levels (Kroeger et al., 2007; Pan, 2008). Fortunately, sports and physical activity can be taught and implemented in structured settings at such intense, repetitious levels. As research has demonstrated, the use of group-based physical activity interventions alone can improve social skill functioning. However, because gains may be limited and because there are now various effective social skill interventions available, it is imperative that these two areas are integrated to address primary social skill deficits while preventing secondary conditions and promoting long-term change. To accomplish this, I propose an integrative model that combines group physical activity, sports, and games with peer training, self-management, and priming to address social skill deficits of individuals with ASD to help prevent the key secondary conditions often associated with ASD.

Implementing Physical Activity Utilizing the SPA Format

SPA is a program that has demonstrated initial success for individuals with ASD. The program focuses on improving physical fitness and motor ability, specifically strength, cardiovascular endurance, flexibility, throwing, kicking,

locomotor patterns, and balance (Schultheis et al., 2000). Activities in the program are based on participants' development, level of physical fitness, and motor ability. Activities include biking, running, weight training, soccer, basketball, and kickball. For this program, treatment is conducted by adapting the environment to fit a person's unique set of needs. Three key elements used in developing the SPA program include physical structure, schedules, and task organization. Because of the group basis of the SPA, implementing the program with adults may best be accomplished by community-based mental health professionals who are serving adults with ASD (e.g., day treatment, club house). Alternatively, because many adults with ASD may not be linked to or eligible to receive services by a public mental health provider, an outpatient counselor may wish to conduct outreach to offer the intervention to adults in need.

The physical structure of the program includes using room dividers, which establish definite boundaries between activity areas. As noted, individuals with ASD improve functioning in performing tasks when clear, visual boundaries are set. The boundaries also decrease external stimuli. According to Schultheis et al. (2000), the establishment of definite boundaries contributes to observed increased emotional stability and independent behavior during activities with less staff prompting. The SPA program suggests providing four to five of these activity sessions, with any potential distractions such as obstacles, objects, and window access removed. Removing potential distractions allows the planned activities to stay on schedule, without interruptions.

Schedules are another important piece of the SPA program because they indicate activities and the order in which they are conducted. In the SPA program, schedules are posted on large poster boards, with the use of activity cards, pictures, and Velcro. After each planned activity, students walk to the schedule to identify which activity is next. One may note that this preparation is a form of priming, given that the individuals are being informed ahead of time of the planned activities. Once the person identifies the next activity on the schedule, he or she removes the Velcro activity card and brings it to the next activity station. SPA programming suggests using different colors and pictures or symbols to identify the students and activities. The overall makeup of the scheduling process will have to be constructed based on the developmental stage of the individuals participating. Overall, schedules are found to increase self-motivation, foster participant independence, and compensate for problems with impaired memory attention and receptive language. Furthermore, using schedules will ultimately reduce time and organizational issues, allowing each task to be completed on time.

Task organization provides participants in the SPA program with clear rules and guidelines with regard to how to complete a task, while also providing a definite beginning and end and no unnecessary complications. Concepts of implementing and maintaining schedules, providing demonstrations of activities with the help of visual markers, and cut-out footprints are important pieces of task organization in the SPA program. In addition, preparing ahead of time and using a timer to begin and end activities are key components of implementing the SPA program.

Implementation Guidelines and Considerations

The National Center on Health, Physical Activity, and Disability (see Swann-Guerrero & Rubio-Cajigas, 2009) provides a comprehensive and detailed list of guidelines and considerations when involving persons with ASD in physical activity and/or recreation programs. The wealth of educational information is broken down into approximately 12 sections, including guidelines and considerations in the following areas: (a) sensory considerations; (b) behavioral considerations; (c) social considerations; (d) cognition considerations; (e) speech, hearing, and communication considerations; (f) neurological and seizure considerations; (g) inclusion considerations; (h) exercise guidelines; (i) cardiovascular guidelines; (j) strength training, flexibility, and balance guidelines; (k) physical activity schedule or daily routine guidelines; and (l) physical activity and recreation suggestions (Swann-Guerrero & Rubio-Cajigas, 2009).

Within these guidelines, Swann-Guerrero and Rubio-Cajigas (2009) stressed the importance of teaching social skills during physical and recreational activities. The authors also endorsed the approach from which the SPA program was derived as being successful in teaching individuals with ASD. Implementing group physical activity, sports, and games with the aforementioned guidelines and considerations is crucial for participant success as well as the safety and well-being for everyone involved. When current social intervention strategies and the SPA format are integrated into such activities, it is hypothesized that the core deficiency and secondary problems of adults can be treated. As is true for the implementation of all treatment models, a rigorous evaluation must be conducted to measure program outcomes and determine if the proposed model is effective.

IMPLICATIONS FOR COUNSELORS

Implementing a program such as SPA has significant implications for professional counselors because it provides the opportunity to treat an adult population that continues to grow in numbers and has been neglected in terms of research and treatment. This particular cost-effective treatment model and approach fills a void in the current treatment process, and counselors can lead the implementation process given their specific skill set and educational background.

Professional counselors are trained to conduct group therapy, utilizing behavioral management strategies to reinforce appropriate social skills while addressing maladaptive behaviors. Counselors are also able to track and record data and observations and provide valuable feedback to other members of the ASD adult's treatment team, as well as natural supports such as the prescribing physician, school staff members, occupational therapist, speech therapist, physical therapist, and parents. In turn, the team may utilize this feedback in the development of an effective treatment plan and reinforce such strategies in all environments. Furthermore, such an approach gives counselors the opportunity to meet adults with ASD outside of the group, providing treatment individually if clinically appropriate. Finally, this particular treatment approach provides an opportunity for counselors to engage in community outreach and utilize their skills of educating and recruiting peers and community members to participate in the program, thus helping to decrease the stigma attached to adults with ASD.

CONCLUSION

Adults with ASD display significant deficiencies in socialization skills, which ultimately lead to secondary conditions that affect everyone. Research strongly supports that participation in group sports, physical activity, and games improves social skills. To address gaps in the literature, this article proposes a treatment model that integrates group physical activities with social intervention strategies that can be used to improve socialization skills and to prevent or combat secondary conditions related to socialization skill deficiencies in adults with ASD. Such a treatment model is beneficial in that it promotes social integration through the common, global culture of sport. In addition, addressing these needs in adulthood may resolve some of the challenges created from the transition of individuals with ASD into adulthood, and may ensure that treatment for ASD is more equitable between age groups. Moreover, such an approach may prove crucial to improving the long-term success of adults related to employment and health, and as a result, may have a positive economic effect not only on the individual but also on the nation. Finally, potential success from this model may motivate adults with ASD to conquer their social isolation, engage in self-advocacy, and become devoted contributors to just causes and society.

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