Spring 5-13-2022

Preparing Paraprofessionals to be Effective in Physical Education

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April 2022

Literature Review Outline

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Abstract

Students with autism often struggle in their physical education class. When the TEACCH (Treatment and Education of Autistic and Communication Handicapped Children) program is implemented, students are engaged with their peers and are able to be successful in a challenging environment through visual schedules, physical structure, and task organization. It's important that paraprofessionals and physical education teachers are aware of this programming in order to decrease challenging behaviors and increase student success in the physical education setting.

Paraprofessionals are such a vital part of the special education team. They are able to see the student in different settings as well as in their special education classrooms and are able to see what works, what doesn't, and they are able to provide support to the student throughout their school day. However, in physical education, students need paraprofessional support on a whole different level. Due to the needs that come with a disability like autism, students struggle with motor, sensory, and communication skills when in a gymnasium. The implementation of TEACCH through paraprofessional support will greatly impact student success and lead to a greater engagement level for students with autism.

Background

Although there isn't as much research on physical activity patterns compared to motor skill difficulties, statistics suggest that children with autism are 40% more likely to be overweight and obese compared to their typically developed peers. What are the causes? One aspect to this statistic is participation. When students aren't successful with physical activities, then how will they build the skills necessary to live an active life and stay healthy?

Much of the discussion and majority of research examining the movement behavior (goal directed movements such as throwing a ball) of individuals with Autism Spectrum Disorder (ASD) has been based on motor abilities (underlying capacities that contribute to performance of movement skills). Research examining the performance of movement skills among children and adolescents with ASD has been limited, but results have consistently associated ASD with poor movement skills compared to peers without ASD (Staples & Reid, 2010). It's important to also think about the demands in a gymnasium in a physical education class. Demands such as gross motor activities, sensory overload, and social skills/communication all play into the physical education environment and it's essential that special education teams are prepared in supporting students, so that they are successful.

Research demonstrates benefits of physical activity, especially moderate to vigorous physical activity across health domains and across the lifespan including improvements in weight status, cardiovascular health, emotional health, and cognitive performance. Numerous studies suggest that moderate to vigorous physical activity may be especially beneficial to children with ASD, shown to decrease rates of stereotyped and repetitive behaviors, and improve cognitive performance, self-regulation, classroom performance, attention and compliance, and social and emotional functioning (Sorensen & Zarrett, 2014). Again, with the benefits of being active, what are special education teams doing in order to make sure their students are successful in the physical education classes with their general peers?

What is Autism Spectrum Disorder?

Autism is characterized by deficits in social skills, communication, and repetitive or restricted interests. We know that there is not one autism but many subtypes, most influenced by a combination of genetic and environmental factors. Because autism is a spectrum disorder, each person with autism has a distinct set of strengths and challenges. The ways in which people with autism learn, think and problem-solve can range from highly skilled to severely challenged. Some people with ASD may require significant support in their daily lives, while others may need less support and, in some cases, live entirely independently (Autism Speaks, n.d.).

Research has established that motor deficits as well as physical activity patterns are visible in children with autism. It's important to think about the benefits of physical activity and how that may affect children with autism who already have motor deficits. In relation to this topic, children with autism experience decreases in negative behavior such as stereotypies and increased positive behaviors, such as time on task following bouts of physical activity (Macdonald et al., 2011).

Research on successful physical education programming for students with autism is an ongoing process due to the individualization of each student who has autism. For example, I have worked with about twenty students with autism and I would have to say that although some have similar characteristics, I have never worked with two that are completely alike. With that said, I feel as though there needs to be more information gathered about best ways to support them. As a developmental adapted physical education (DAPE) teacher, I have seen how students with autism may struggle in a general physical education class and I want to dive into the best ways to support them with general education curriculum while also keeping them successful, independent, and safe. Due to their needs in the areas of social skills, communication, and motor, they need adaptations, modifications, and support in order to be successful with their peers in their school years and lead a healthy life after high school.

Anatomy of Motor Impairment

Although impaired social interaction is considered to be the core deficit in ASD, motor impairment is a comorbidity. Due to this deficit, it may affect functional capacity and

socialization skills in children and gross motor disorders can be detected as early as 14 months of age and become more pronounced at 24 months of age. Both socialization skills and learning gross motor skills are facilitated by the mirror neuron system, a group of neurons located in the prefrontal gyrus and inferior parietal lobes activated during observation of the actions of another individual when imitating that action. This system also aids in understanding the thoughts, intentions, and emotions between the observed action or behavior, by creating an internal simulation and mapping it to the observer's own motor representations in the corresponding brain region. Failure in the activation of the mirror neuron system has been demonstrated in children with ASD, and the severity of mirror neuron system dysfunction has been shown to be correlated with the severity of autism symptoms. This may explain the association between gross motor ability and socialization skills in children with ASD, as these children have difficulty understanding emotions and intentions behind the behavior of others (Pusponegoro et al., 2016).

Understanding Gross Motor Needs of Students With Autism

Pusponegoro et al. (2016) found that below average gross motor function was found in eight of 40 (20%) children with ASD. The mean gross motor v-scale score in the ASD group was 15.1, significantly lower than in the control group. Compared to the controls, the children with ASD showed a delayed ability in object manipulation. The differences were most prominent in ball throwing and catching, using stairs, jumping, and bicycling. Almost all of the children aged 1-3 years in the control group were able to roll a ball while sitting on the floor or ground, throw a ball, kick a ball, whereas in the ASD group only 19 of 33 children were able to roll a ball while sitting on the floor, 20/33 were able to throw a ball, and 17 of 33 children were able to kick a ball. In addition, the children in the ASD group tended to have difficulties in using stairs. All children aged 3-6 years in the control group were able to walk up and down stairs using alternating feet, while in the ASD group, at the same age only 14 of 16 children were able to walk up stairs and only 8 of 16 children were able to walk down stairs using alternating feet. Standing on one foot was also a problem in the ASD group, with only six of 40 (15%) children being able to do so. The ability to catch a ball in the control group appeared to improve with age; at 5-6 years of age, all the controls were able to catch a small or large ball from a distance of

at least 2 m. At the same age, only five of 40 (12.5%) children with ASD were able to catch a small ball from a distance of 0.5-1 m and only eight of 40 (20%) children with ASD were able to catch a large ball from a distance of at least 2 m. All the children aged 3 years in the control group were able to ride a tricycle, an ability mastered by only two of nine children in the ASD group.

Along with gross motor skills, physical activity patterns should be a focus for physical education in order for children with autism to gain these skills. Macdonald et al. (2011) found that results indicated the significant differences between the mean time spent in moderate to vigorous physical activity and the mean time spent in sedentary activity. Another important finding is that older children with autism spectrum disorder are significantly more physically inactive, compared to younger children.

When thinking about gross motor skills that a student needs in order to be successful in physical education, it's important to note Schultheis et al. (2000) study which states that in order for students with autism to be successful in a physical education setting, it's essential to incorporate the three components of the TEACCH (Treatment and Education of Autistic and Related Communications-Handicapped Children) program. These components include physical structure, schedules, and task organization. It's important to keep in mind that each element is modified to adhere to the physical education environment and to accommodate the unique characteristics and preferences of students with autism.

Importance of Paraprofessionals in Physical Education

Responsibilities of paraprofessionals can include duties prior to, during and after each class, such as (1) assisting students' movement as needed, (2) keeping students on-task to listen to instructions, (3) repeating instructions if needed, (4) prompting students for safe transitions, (5) assisting teachers with assessment procedures, and (6) participating in activities with students. It's important to keep in mind that these duties may change or fluctuate depending on if the student is in a special education or general setting with their classmates (Lee & Haegele, 2016).

Paraprofessionals tend to have a wealth of knowledge pertaining to each student because they spend more time with their students than anyone else in the school system. This is

something to keep in mind when integrating supports in the general physical education class. The paraprofessionals have seen what might have worked, what didn't, as well as what the special education teacher is implementing in other classes. When paraprofessionals are utilized appropriately, they can contribute their knowledge about the students to the PE teachers, thus helping to ensure a quality PE experience for children with disabilities (Lee & Haegele, 2016).

Supports To Ensure Success in the Physical Education Setting

Strength, cardiovascular endurance, flexibility, throwing, kicking, locomotor patterns, and balance are skills that teachers integrate into the program in order for students to meet physical education standards and benchmarks. It's the teacher's job to make sure the activities and content presented are at the levels of each student as well as their IEP goals and objectives. Paraprofessionals are a key component to this as well.

One of the primary concerns identified in physical education/activity literature is that procedures and environment of physical education have not been adequately adapted so that maximum instructional time can be provided. Schultheis et al. (2000) used room dividers during gross motor skills testing and it provided several positive results for students with autism. When students were able to identify and remember the activities that were associated with each activity area, then they were more independent with that activity/class time and required fewer teacher prompting. Physical boundaries also increased the level of students' emotional security since many students can be overwhelmed and overstimulated with large and empty spaces. Room dividers eliminated the feeling of an overwhelming atmosphere. Schedules were also used in this study. Each student had their own individualized schedule that they were asked to follow for class. After the expectations were explained, students were able to successfully transition from one activity to the next with fewer prompting from a teacher. Task organization helps students complete activities with clear guidelines. Timers were used in order to indicate when a task was completed and when the exact number of equipment pieces were used to complete a task. For example, a paraprofessional or physical education teacher could provide three basketballs if they would like the student to shoot a basketball three times. Students are able to carry out that type of activity more successfully and with independence.

Purpose: Successful and Active for Life

As previously mentioned, statistics suggest that children with autism are 40% more likely to be overweight and obese compared to their typically developed peers. With that said, I thought about the learning and practice that takes place in elementary, middle, and high schools for students without autism in order for them to be successful with physical activity and movement after high school. It takes years of practicing different skills in order to be successful and if teachers don't have the right support in place, then students with autism will struggle in physical education which will turn into after high school struggles and potentially health problems.

Physical activity programs and interventions need to address the physical activity deficit in children with autism in order for them to live healthy and active lifestyles. Arnell et al. (2020) surveyed parents of children with autism and found the challenges in participating in physical activity were often due to difficulties related to the ASD per se. The parents involved in the study frequently mentioned the adolescent's motor difficulties and uncertainty regarding physical skills, resulting in low athletic competence, but difficulties with social interaction during physical activity were also highlighted. The parents reported that their adolescents often chose not to participate in physical activities because they perceived the demands as too high. Many challenges described by the parents were related to team sports and their associated social interaction demands. Team activities require an understanding of and ability to follow rules and regulations. Some of the parents observed that their adolescents needed not only to understand and follow rules themselves, but also to control other participants' compliance with rules, which could impair their participation. The parents in this study also mentioned that another challenge associated with physical activity was the unpredictableness. Different kinds of challenging demands commonly occur simultaneously in a physical activity context and the adolescents have to adapt to these demands when they participate. Demands such as varying weather conditions or unclear expectations, as well as demands related to social surroundings, could be difficult for these adolescents to manage.

The study illustrates the need to recognize the individual conditions for participation in physical activity that adolescents on the autism spectrum express. Our main goal is to keep

students with ASD active, so we need to prepare them to be successful in their physical education classes.

Future Studies/Considerations

There are many different types of behavior and cognitive levels for each student with autism. Some students with autism are verbal and are able to be independent in their PE class. However, there are students who are not able to communicate or use some type of communication device. I want to know how the functioning levels are different as it relates to physical activity? If a student is non-verbal, then what does that mean as far as gross motor skills/needs? Staples & Reid (2010) mention that students with autism are able to perform most skills, but their low scores in the TGMD-2 (Test of Gross Motor Development) standardized test reflect the poor quality of how they performed the skills; with some of the skills appearing to be consistent qualitative differences. If students with autism are able to perform most skills (even with low quality), then in my eyes, they will be able to learn how to perform the activities correctly with the right tools in place. What tool is most beneficial in order to help students with autism learn a movement skill in order to meet the physical education benchmark/standard?

The Future of the Capstone Project

I plan on creating a physical education toolkit that includes visuals, timers, schedules, and other essentials for the paraprofessionals to help support students in the PE class. I would like to present on this toolkit to paras and show them how to support students with each part that's included in the toolkit, so that they know how to use these kits that are in the PE class in order to help support students. I would also like to present at PLC or professional development days. I could either use my capstone project presentation and talk about TEACCH or I could go into depth on how to use the PE toolkit. Throughout the school year, I would also like to send out Google form check-ins to paras in order to see how their PE class is going with their student and what they need help with in order to help support students.

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