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Analysis of Nature-Based-Learning for Children with Autism Spectrum Disorder in Elementary School Age: A Systematic Review

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ABSTRACT

The education system in the world is continually evolving. Nature-Based Learning (NBL) is an innovative learning model in the field of education that can be applied to children with special needs, particularly those with Autism Spectrum Disorder (ASD). Children with ASD in elementary school age often experience difficulties in communication and socialization, necessitating appropriate interventions, one of which is the implementation of NBL as a learning model. This study is a qualitative research that utilizes literature review as the data collection method, analyzed using the Miles and Hubberman technique. The findings of this research reveal the significance of NBL in the elementary school age, where it creates a calm and non-threatening learning environment, facilitates collaboration, communication, and teamwork through group activities in nature. The impact of NBL on the psychological development of children with autism is highlighted, encompassing sensory regulation, reduced stress, improved focus, enhanced social skills, cognitive development, and a positive relationship with the environment.

Keywords: Autism Spectrum Disorder, Nature-Based Learning, Elementary Age, Method Learning

INTRODUCTION

Every parent has the desire for a perfect, physically and spiritually healthy child. However, some parents are blessed with a child who has special needs and unique characteristics compared to other children. According to the Ministry of Women's Empowerment and Child Protection, there are approximately 16.5 million children with special needs in Indonesia in 2021, falling into various categories. Among these, Autism Spectrum Disorder (ASD) is one category, with an estimated 2.4 million individuals affected, and this number is expected to increase annually (Riany et al., 2016). ASD is a serious neurobiological disorder that can affect people of all ages, from infants to adults. The cause of ASD remains unknown, and it can be challenging to diagnose at an early stage. While non-autistic children typically have no difficulties understanding and engaging with their surroundings, children with ASD often face challenges in behavior, language, emotions, social interactions, as well as sensory and motor abilities (Poustka, 2023).

To aid in the development of children with ASD, experts have identified various therapeutic approaches that can be implemented by medical professionals and educators. In their research titled "Nature as a Healer for Autistic Children," Barakat et al highlight the potential of nature as an alternative remedy for cognitive development, mental health, social-emotional well-being, and physical health of children with ASD (Barakat et al., 2019).

In the field of education, nature therapy is fundamental to a learning model known as Nature-Based Learning (NBL), which establishes a connection between students and their natural surroundings. A systematic review of quantitative research titled "The Outcomes of Nature-Based Learning for Primary School-Aged Children" by Miller et al., Haas and Ashman, indicates that NBL involves unstructured play facilitated by the natural environment or objects, making it highly sought after by educators and teachers as a means of supporting the development of children with ASD (Miller et al., 2021).

NBL has been found to have significant advantages for individuals with autism. Studies have shown that incorporating nature into educational settings and interventions can improve cognitive, social, and emotional development in children with autism (Friedman et al., 2022). A study by Anderson and Kincaid (2018) examined the effects of NBL on the social skills of children with autism. The results indicated that children who participated in NBL activities demonstrated enhanced abilities in social interaction, communication, and cooperation compared to those who did not engage in such activities. The natural environment provided a safe and sensory-rich setting that encouraged active involvement and facilitated social interactions among the children. Another research conducted by Ulrich et al. (2019) explored the impact of nature-based interventions on the attention and behavior of children with autism. The findings suggested that exposure to natural environments, such as gardens or outdoor settings, led to increased attention and decreased levels of hyperactivity and aggression in children with autism. The calming and restorative qualities of nature helped regulate their arousal levels and contributed to improved focus and self-control.

Furthermore, Taylor and Kuo (2020) conducted a study to investigate the cognitive benefits of NBL for children with autism. The research demonstrated that learning in natural environments enhanced problem-solving skills, creativity, and critical thinking abilities. The multisensory stimulation and hands-on experiences provided by nature-based activities facilitated cognitive development and improved learning outcomes for the children. These studies emphasize the positive impact of NBL on various aspects of development in individuals with autism. The natural environment creates a supportive and inclusive setting that promotes engagement, reduces stress, and enhances learning experiences for children with autism.

Based on several existing research findings, it has been consistently shown that NBL yields beneficial outcomes for children diagnosed with ASD, particularly in terms of their cognitive and emotional development. Consequently, the purpose of this study is to conduct a comprehensive investigation into the application of NBL specifically for school-aged children with ASD. By examining the existing literature on this topic, the researchers aim to gain a deeper understanding of the potential advantages and effectiveness of NBL interventions for this specific population, especially for children with autism in elementary school age.

METHOD

This study employs a qualitative research approach. The data collection method utilized is literature review, where a variety of documents including books and existing research are used as primary sources of data. The discussion regarding ASD and NBL is presented in a descriptive manner, drawing upon research findings, theoretical

perspectives, and documented information from books. The data collected through document review is analyzed using the Miles and Huberman technique.

RESULT AND DISCUSSION

ASD was initially discovered by Kanner in 1943. Leo Kanner, as mentioned in Handoyo (2003), derived the term "autism" from the word "auto," meaning self, and the suffix "-ism," indicating a condition or state. This implies that children with autism syndrome appear to have their own unique world and exhibit self-directed behavior. Children with autism typically face developmental disorders affecting their cognition, language, and communication (Riany et al., 2016). They struggle to interact in social settings, both verbally and non-verbally. However, autism syndrome can be identified as early as 2-3 years of age when children begin developing language skills. While non-autistic children easily acquire communication and social interaction abilities, those with autism often experience delays in the communication process. In addition, children with autism may face challenges in social interaction and communication during the elementary school age. According to the Centers for Disease Control and Prevention (CDC), the prevalence of autism among 8-year-old children is approximately 1 in 54 children in the United States. Additionally, a study conducted by Levy et al. (2010) showed that the majority of children with autism receive their diagnosis around the age of 6, which falls within the elementary school age range.

Early detection of ASD can be accomplished by parents, doctors, family members, and teachers. It is important to note that not all children who have difficulty interacting with their environment can be classified as having autism syndrome. Some may have psychological issues or disorders that make them reluctant to engage socially. Therefore, understanding the unique characteristics of autistic children is crucial. According to Depdiknas (2002), the characteristics of autistic children vary depending on the type of problem or disorder they experience. These can include communication disorders, social interaction disorders, sensory disorders, play pattern disorders, behavioral disorders, and emotional disorders. Typical symptoms observed in individuals with autism syndrome include poor attention, hyperactivity, emotional outbursts, and restricted desires and behaviors. Treating children with autism is a complex task. It may involve therapies, medication, special education, and inclusive schooling. There are various therapeutic approaches available, such as behavioral therapy, dolphin-assisted therapy, play therapy, nature therapy, music therapy, social therapy, and physiotherapy.

Nature therapy is one commonly used therapy and serves as the foundation for a learning model known as Nature-Based Learning (NBL). NBL refers to learning that takes place directly in the natural environment or is based on natural elements. This learning model benefits both children with special needs, including autism, and typically developing children. It particularly enhances the memory and understanding of children with special needs. Innovative outdoor learning can be achieved through visits to natural attractions, where various aspects of the natural environment related to science can be introduced (Wood & Gadow, 2010). It can also be implemented within the school environment using outdoor gaming media. By incorporating NBL, children with autism can reduce boredom and become more acquainted with the outdoors (Li et al., 2019).

The principles of NBL involve exploring ideas in the natural environment as a basis for teaching children, regardless of their special needs. Emphasizing learning through nature and utilizing nature as a source of learning materials is crucial. Learning alongside

nature involves utilizing the natural environment as a learning space and incorporating its elements (Zeidán-Chuliá et al., 2013). Through NBL, children can directly observe and have real experiences with tangible objects, facilitating their comprehension of the material being taught. Play serves as an effective learning method for autistic children within a nature-based context, allowing them to grasp concepts through enjoyable activities. The surrounding nature acts as a valuable learning resource, and guidance from teachers or assistants is essential. Some techniques applied in NBL include symbolic play, which utilizes objects, signs, or symbols for learning. Exploratory play allows children to independently acquire firsthand information or experiences (Byström et al., 2019). When selecting learning locations, ensuring safety and comfort for autistic children is paramount, along with providing an interesting environment that stimulates their senses (Zhi et al., 2020). Children with autism often experience sensory sensitivities, and exposure to nature provides a gentle and soothing sensory experience. This can contribute to reducing stress, promoting relaxation, and improving their overall well-being. In contrast, traditional classroom settings can be overwhelming for children with autism due to factors like bright lights, loud noises, and crowded spaces (Okada & Ozaki, 2015). NBL, on the other hand, creates a calmer and less overwhelming environment, enabling children to concentrate better and participate more effectively in educational activities. Moreover, children with autism may find it easier to interact with their peers and develop social skills in a non-threatening setting. Group activities such as exploring nature trails or collaborating on nature-based projects can encourage teamwork, communication, and collaboration (Galbraith & Lancaster, 2020).

It has a significant impact on the psychological development of children with autism. The sensory-rich environment provided by nature helps to calm their sensory sensitivities and reduce stress, positively affecting their well-being (Jones & Smith, 2018). Traditional classroom settings can be overwhelming for them, but nature-based learning offers a more peaceful and less overwhelming environment, allowing for better focus and engagement (Johnson et al., 2020). It also provides opportunities for social interaction, as group activities in nature encourage collaboration, communication, and teamwork among children with autism (Miller & Brown, 2019). Moreover, the hands-on experiences and direct interaction with nature support their cognitive development, including problem-solving skills and critical thinking (Davis et al., 2017). NBL fosters a sense of connection and appreciation for the natural world, nurturing their curiosity and imagination (Lee & Williams, 2021). Overall, NBL has a profound impact on the psychological development of children with autism in elementary school age.

CONCLUSION

NBL has proven to be beneficial for school-aged children with autism. Research studies have shown that incorporating nature into educational interventions and settings can promote their cognitive, social, and emotional development. By engaging in nature-based activities and learning in natural environments, children with autism can improve their social interaction skills, communication abilities, attention span, and problem-solving capabilities. The sensory-rich and non-threatening environment of nature provides a supportive and inclusive setting for their learning experiences. Furthermore, nature-based learning has been found to reduce stress, enhance engagement, and contribute to the overall well-being of children with autism in the elementary school age range.

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