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The Effect of Water Games on Gross Motor Skills in Early Childhood

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ABSTRACT

This study aims to investigate the impact of water play on the motor skills of young children. The research method used was an experiment with a one-group pretest-posttest design. The subjects of the study were 7 children aged 4–7 years, selected using a purposive sampling technique. The measurement instrument used was the Movement Assessment Battery for Children (MABC), which included tests of throwing as far as possible, running obstacles, and jumping without a run-up. The treatment, in the form of a water play program, was conducted over 6 meetings, each lasting 60 minutes. Data analysis was conducted using a paired sample t-test at a significance level of 0.05. The results showed an increase in the average score from 5.14 in the pretest to 8.00 in the posttest. The t-test yielded a significance value of 0.000 ($p < 0.05$), indicating a highly significant difference between the before and after treatment groups. Thus, water play has been proven to have a positive effect on improving the motor skills of early childhood. This activity can be recommended as an alternative method of physical learning that is fun and effective in early childhood education.

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INTRODUCTION

Early childhood is often referred to as the golden age, a unique period that only occurs once in a child's life. During this phase, children exhibit a strong sense of curiosity and a natural drive to explore their environment through physical activity and play. This golden age significantly determines the direction of a child's future development, so appropriate stimulation is necessary to ensure optimal development of their potential (Chapnick, 2008).

Physical activity plays a crucial role in supporting early childhood development, including physical, cognitive, and socio-emotional development. One popular activity is swimming, which is known not only for its health benefits but also for supporting children's motor development. According to (Febrianta, 2016), Swimming is a fun water sport that offers great benefits, including promoting body growth and enhancing physical fitness.

Parents play a crucial role in supporting their children's activities, including sports. Parents not only provide physical support but also provide motivation, guidance, and positive emotional experiences (Wahid & others, 2020). With parental involvement, children's sports activities can be more focused and have a significant impact on their motor development.

Unfortunately, the development of modern technology presents new challenges, particularly the increased use of gadgets among young children. This leads to children being less active, potentially hindering their motor development. In this context, swimming and water play are effective interventions to stimulate motor development while fostering children's social and emotional development (P. P. Sari et al., 2020).

Motor skills refer to an individual's ability to perform physical activities that involve coordination between the nervous, muscular, and skeletal systems. (Decaprio, 2013) emphasizes that gross motor skills are body movements that use large muscles and are influenced by maturity. Through good motor skill mastery, children can become more confident, ready to participate in physical activities, and lay a foundation for future sports skills.

Water play is an excellent way to stimulate motor skills in young children. Simple activities like jumping, kicking, paddling, and balancing in the water help strengthen muscles and improve coordination. Furthermore, water play fosters motivation because it's a fun and engaging experience (Pangrazi & Beighle, 2013). The water environment is even safer than land activities because buoyancy minimizes the risk of injury (Griffiths, 2003).

Water games are very diverse and can be adapted to the child's needs, from splashing, catching toy fish, playing with water balls, to jumping into a pool. These activities not only develop gross motor skills but also develop children's social skills through group interaction (Utami & Wulandari, 2019). Thus, water play can be used as an effective and fun educational strategy.

Furthermore, playing in water provides additional benefits, such as helping children overcome fear, fostering courage, increasing self-confidence, and developing the ability to interact with others (Tinggi et al., 2010) emphasized that water play also contributes to children's cognitive development and creativity through the use of imagination and cooperation.

Several previous studies have examined aquatic activities on motor development, for example (Yunanto, 2020)**,** which studied children with mild intellectual disabilities. The results showed a significant effect of aquatic activity on gross motor skills. However, studies on the effects of water play on early childhood with typical development are still limited. This indicates a research gap that needs to be addressed.

Based on this description, research into the effect of water play on the motor skills of early childhood is important. The novelty of this research lies in its focus on using water play as a systematic intervention, measured using the Movement Assessment Battery for Children (MABC). This research is expected to contribute to scientific knowledge and provide practical recommendations for teachers, coaches, and parents in optimizing child development during the golden age.

METHODS

This study employs an experimental method with a one-group pretest-posttest design, involving an initial test (pretest), treatment in the form of water games, and a final test (posttest) to assess the difference in results before and after treatment.

The research subjects were seven children aged 4–7 years who were selected using purposive sampling techniques from a population of 15 children at the SR Swimming Course (Lenaini, 2021). The instrument used is the Movement Assessment Battery for Children (MABC), which assesses gross motor skills, with three types of tests, namely throwing as far as possible, running obstacles, and jumping without a run-up (Henderson et al., 2007).

The treatment was carried out six times over three weeks, each lasting 60 minutes, using a ladder system method to provide a gradual training load (Harsono, 1988). The pretest and posttest data were analyzed using the Paired Sample t-Test with the Shapiro-Wilk normality test as a prerequisite using SPSS 25 (Fadluloh et al., 2024).

RESULTS AND DISCUSSION

Table 1.
Descriptive Statistics

	N	Minimum	Maximum	Mean	Standard Deviation
Pretest	7	4	6	5.14	.900
Post Test	7	7	9	8.00	.816
Valid N (listwise)	7				

Based on the analysis results, the average pretest score was 5.14 with a minimum score of 4 and a maximum score of 6, and a standard deviation of 0.900. Meanwhile, the posttest score showed an increase with an average of 8.00, a minimum score of 7, a maximum of 9, and a standard deviation of 0.816. These results indicate an average difference of 2.86 points between before and after treatment, suggesting that children generally experienced an increase in motor skills after participating in water games.

Table 2.
Normality Test

	Shapiro-Wilk		
	Statistics	df	Sig.
Pretest	.818	7	.062
Post Test	.858	7	.144

The test results showed a significance value of 0.062 for the pretest and 0.144 for the posttest. Because both significance values are greater than the critical limit of 0.05, it can be concluded that the distribution of the pretest and posttest data is normal. With this normality assumption met, hypothesis testing can be conducted using a parametric test, namely the Paired Sample t-Test.

Table 3.
T-test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Standard Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pretest - Posttest	-2,857	.690	.261	-3,495	-2,219	-10,954	6	.000

The test results showed a significance value of 0.000. Since the significance value is less than 0.05, it can be concluded that there is a very significant difference between the pretest and posttest results. This means that water play has a positive effect on improving the motor skills of early childhood in this study.

The results of this study indicate that water play significantly improves motor skills in early childhood. This is evidenced by the increase in the average score from 5.14 in the pretest to 8.00 in the posttest. This difference indicates that the water play activity has a positive impact on children's motor development. In the context of early childhood development, motor skills are a fundamental aspect that underpins a child's overall growth and development, as emphasized by Darmawan and Kusuma (2019), who note that early movement stimulation is important to support children's physical and psychomotor development.

Motor skills are closely related to activities involving large muscles, such as running, jumping, and throwing. Through water play, children engage in these activities in a fun way. Movements such as jumping in the water, pushing floating objects, or maintaining balance while treading water help children develop body control and muscle strength. Astuti, (2020) Physical activity-based games can significantly improve muscle control and body coordination in early childhood.

Activities in water provide a unique movement experience. The water medium creates natural resistance that forces children to work harder to perform simple movements. This water resistance increases muscle activity without putting excessive stress on joints. This aligns with findings by Safitri and Riyanto (2018), which explains that water creates a safe and effective exercise environment for strengthening muscles and increasing children's flexibility.

The water play activities in this study were designed not only as a means of motor training but also as a medium for play. Children engaged in the activities without pressure and enjoyed doing so. This is important because a positive emotional atmosphere also influences motor learning outcomes. Sari and Yuliani (2016), the learning process, accompanied by a sense of joy and enthusiasm from children, results in more optimal physical and mental involvement.

When in water, children not only move but also feel the temperature, pressure, and movement of the water against their bodies. This enriches the sensory experience and helps activate the proprioceptive and vestibular systems, which are related to body balance. A study by Lestari and Prasetyo (2017) states that water activities stimulate sensory integration, which plays a role in the development of children's motor skills.

Water play also contributes significantly to boosting children's self-confidence. Children who are initially afraid of water gradually adapt and engage in various activities in it. Successfully overcoming these challenges builds courage and self-confidence. Nurhasanah (2016), structured and enjoyable physical activities can increase positive self-perception and strengthen children's self-concept.

Beyond individual aspects, water play also encourages social interaction between children. During play, children learn to take turns, work together, and complete tasks in groups. These social skills develop through enjoyable and directed play experiences. As noted by Rosyidah and Hidayat (2019), group play activities in water media strengthen children's social relationships and improve their empathy and communication skills.

The increase in posttest scores in this study reflects that structured training can produce real change. This aligns with motor learning principles that emphasize the importance of repetition, consistency, and positive reinforcement. Rachmawati and Winarni (2017) emphasizes that improving children's motor skills is highly dependent on the frequency and quality of training provided consistently.

This finding is reinforced by previous research by Widodo and Prasetya (2018), which found that water play activities can improve the coordination and agility of children aged 5–6 years. This means that the results of this study are not isolated but align with various other findings demonstrating the positive impact of water play on children's motor development.

Theoretically, these results support Gallahue & Ozmun's motor development theory, which states that a child's motor development is influenced by the maturity of the nervous system and environmental experiences. In this case, water provides a complex environment that accelerates this development (Herlina & Dewi, 2016).

The training design used in this study was also a crucial factor. The training was conducted in stages, progressing from simple to complex activities over six sessions. Each session was structured systematically and engagingly, ensuring that children not only felt challenged but also felt satisfied with their achievements. This aligns with the thematic learning approach recommended in early childhood education (Utami & Wulandari, 2019).

A safe and enjoyable pool environment contributes to the effectiveness of these activities. Children feel free to express themselves without fear of injury. A comfortable and low-pressure environment helps children focus on the activity and confidently try various movements. A study by Munifah and Sulastri (2015)shows that a child-friendly environment influences the quality of children's involvement in motor learning activities.

Coach support during the training process significantly contributes to the program's success. Coaches model, encourage, and ensure each child performs the movements correctly. This facilitator's role is crucial in maintaining children's motivation and engagement throughout each session. This aligns with the opinion of Ramadhani (2018) that the presence of teachers or instructors who understand the characteristics of early childhood will maximize the effectiveness of physical activity.

The role of parents in supporting the success of the program cannot be overlooked. Parents who actively support them, both morally and logistically, tend to make children feel more confident and enthusiastic about participating in activities. Research results, Putri and Hidayati (2020), show that parental involvement in children's motor development programs has a positive impact on children's consistency and achievement results.

Through water play, children also have the opportunity to recognize their own abilities. Completing tasks such as jumping in the water or catching objects makes children feel proud and motivated. This strengthens their self-concept and increases their intrinsic motivation to continue learning. This is in line with Bandura's theory (in Fitriani and Hadi, 2019), small successes that children feel will increase self-efficacy and encourage repetition of positive behavior.

These findings suggest that water play is not only beneficial for developmentally normal children but also has potential for application in inclusive education. Children with motor developmental disorders or mild physical disabilities can significantly benefit from water activities. According to research by Setiawan and Sari (2020), water-based therapy is effective in improving gross motor skills in children with special needs because of the nature of water, which supports free movement without pressure.

In the context of a physical education curriculum for early childhood, water play can be part of a fun and effective alternative learning program. Teachers can design water-based activities as part of learning themes that stimulate children's physical, social, and emotional aspects. Similar recommendations were made by (Puspitasari & Handayani, 2016), which suggests the integration of water activities in PAUD programs for the holistic development of children.

The results of this study generally reinforce the understanding that water play is an effective method for improving motor skills in early childhood. By combining elements of play, exercise, and learning, children develop not only physically but also psychologically and socially. Therefore, this approach is suitable as an adaptive, flexible, and enjoyable model for children's motor skills learning in various early childhood education institutions.

CONCLUSION

Based on research findings on the effect of water play on early childhood motor skills, it can be concluded that water play has a significant positive impact on improving children's motor skills. This activity can stimulate various aspects of gross motor skills, such as balance, coordination, and muscle strength, and build confidence in movement. Furthermore, water play also provides a fun, safe, and educational learning environment, thus supporting not only physical development but also contributing to children's social and emotional development. Therefore, water play can be used as an effective alternative learning method in early childhood education.

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