

The Effect of Swimming in Meltdown Reaction among Children with Autism

Maisarah binti Mohd Saleh

*Faculty of Sport Science and Recreation, Universiti Teknologi MARA Cawangan Pahang,
Malaysia*

Siti Fadhillah binti Abd Hamid

*Faculty of Sport Science and Recreation, Universiti Teknologi MARA Cawangan Pahang,
Malaysia*

Fatin Aqilah binti Abd Razak

*Faculty of Sport Science and Recreation, Universiti Teknologi MARA Cawangan Pahang,
Malaysia*

Saidatul Nur Syuhadah binti Sabadri

*Faculty of Sport Science and Recreation, Universiti Teknologi MARA Cawangan Pahang,
Malaysia*

Nur Natasya Nadeeya binti Mohd Rafi

*Faculty of Sport Science and Recreation, Universiti Teknologi MARA Cawangan Pahang,
Malaysia*

Abstract

This study conducted to identify the effect of swimming in reducing meltdown in children with autism in Pusat Akuatik Darul Ehsan. The study focused on effect of before and after swimming towards children with autism at Pusat Akuatik Darul Ehsan. There were 25 children with autism aged between 4 to 7 years old were involved. The instrument used in this study was The Multidimensional Assessment of Preschool Disruptive Behavior (MAP-DB) questionnaire. The parents with autism kids were asked to answer the questionnaires before swimming class and after 2 months of swimming classes to evaluate their children. Paired t-test was used to identify the differences effect between before swimming and after swimming. The result showed that all the components of the MAP-DB questionnaire have significant effects in reducing meltdown towards autism ($p=0.000$). In a nutshell, this study implied that that swimming had significant effect for autism kids in reducing meltdown.

Keywords *Autism, Swimming, Meltdown.*

Introduction

Autism spectrum disorder (ASD) was a complex brain development disorder characterized by limiting behaviours and a significant impairment of ability to communicate with other people and participated in verbal or nonverbal communication, as well as in a play (American Psychiatric Association, 2013). Autism can cause by solid genetic basis (Abrahams & Geschwind (2008). Besides that, the exposure to air contamination during pregnancy, especially overwhelming metals and particulates, may rise the risk of autism (Lyll, Schmidt & Hertz-Picciotto, 2014). There were several categories treatment for autism includes behavioural therapy, medication, and therapeutic options.

Tantrum or meltdown was an uncontrolled burst of anger and frustration that associated with children with autism. Meltdown were reaction to something and were usually beyond child's control. The diagnostic criteria for ASDs is grounded on social and behavioral impairments, many children with ASDs may frequently have difficulties in motor skill and delays that can lead to decreased physical activity levels and social plays (Yanardag, Akmanoglu, & Yilmaz. (2013). A variety of treatment options were available, including behavioral therapy, sensory integration, music therapies, speech and language therapy, occupational and physical activity therapy, interaction with animal and aquatic therapy (Kong, Chen & Wang (2012).

Physical activity can be defined as any human body movements provided by skeletal muscles that required energy expenditure. It was now said to be an extensively accepted technique to reduce meltdown in children with ASD (Purpas & Reid, 2001). A study supports a healthy lifestyle require two major mechanisms which are exercises and physical fitness. This gives a significantly impact for children with autism in improving their motor abilities (Auxter, 1997).

Numerous studies have identified the outcome of physical activity in the lessening of stereotypical behaviors which is tantrum among children with autism (Rosenthal-Malek & Mitchell, 1997). A finding conducted by Lang (2009) implied that by doing physical activity could help individual with ASD in reducing their tantrum with a suitable type of psychical activity program. Even though physical activity cannot diminish meltdown, it could adjust or limit the response to an appropriate response (Prupas & Reid, 2001). Similarly, doing physical activities have pointed out that it has been positive development in physical health, intellectual functioning, behaviour, personality and attitude (Folkins, 1981). Apart from that, swimming can be categorised as physical activity. In one finding conducted by Yilmaz (2014), pointed out that a 10 weeks of swimming program helped in reducing meltdown, sensory combination, body coordination, social skills development and muscle tone. It can help to restore and regain function for persons with chronic disabilities, or syndromes (Jake, 2003).

Children with ASD may acquire great opportunities by joining swimming and aquatic experiences, that will help stimulate body physical, fundamental of motor skill, social interaction with others, and emotional values (Huettig, & Darden-Melton, 2004). A design with a careful instructional aquatic lessons can enhance development of fundamental skills of children with autism. This will help them to use the skill throughout their lifespan (Lepore et al., 2007).

Furthermore, Jake (2003) expressed that aquatic treatment can offer assistance to repair, expand, or maintain work for people with constant inabilities, or disorders. Broach and Dattilo (1996) clarified that populaces that can advantage from this treatment may join individuals that have inconveniences with material handling or heading, and de - conditioning as a result of analyze such as developmental delay, autism, and others. Vonder Hulls, Walker and Powell (2006) claimed that swimming increased swimming abilities, focus, strength of muscle, stability, touch tolerance, maintenance of eye contact, and water safety after conducting a survey on children with autism ages 4 to 10. Likewise, Pan (2010) verified that the

effectiveness of a water exercise swimming shown a significant improvement in swimming skills and a decline in antisocial behaviors such as self-stimulatory performances.

Apart of physical developments, psychological impact also plays a role as water surround the body it will decrease anxiety and depression that lead to enhancement of mood and relax the body of children with ASD (Broach, & Dattilo, 1996). Some individuals with autism who are not familiar with new situations may react fearfully, while others have very little fear, which can risk their life situation. In an aquatic environment, some may need an ample time to adjust themselves when they are being submerge in water, while others need a full supervision because they may not aware of dangerous related with water (American Red Cross, 2009).

Most studies are interested to study on physical activity training and water exercises that said to be effective for the evolution of physical fitness and water orientation capabilities of an autistic subject (Yilmaz, Yanardağ, Birkan, & Bumin, 2004). However, there is limited studies, studied on effect of swimming in reducing meltdown among children with autism. The purpose of the study is to identify effect of swimming in reducing meltdown in children with autism.

Methodology

Participants

There were 25 male and female children with autism aged between 4-7 years old were participated in this study. The children with autism's guardian were required to answer the questionnaire form. All the subjects were student from swimming club at Pusat Akuatik Darul Ehsan. Exclusion criteria included (a) the period of swimming class and (b) the severity of autism.

Instruments

The research instrument that utilized in this study was The Multidimensional Assessment of Preschool Disruptive Behavior (MAP-DB). Items were rated in terms of frequency over the past month: 0 = never in the past month; 1 = rarely (less than weekly); 2 = some days (1-3 days per week); 3 = most days (4-6 days); 4 = daily; and 5 = multiple times per day. In this study, demographic information consists of 2 items of the subject's background which were gender and age.

Procedures

The questionnaire and cover sheet were compiled into survey packets and were distributed to the parents of autism kids from 5 different swimming clubs in Pusat Akuatik Darul Ehsan, Shah Alam. Parents were given sufficient time to complete the questionnaire. The first questionnaire needed to be answered during the first class and the next questionnaire needed to be filled up after 8 classes or 2 months after the first questionnaire had answered.

Finding and Discussion

Results

In order to analyze the data, descriptive statistic and pair t- test were used in order to fulfill the purpose of the study which was to identify is there any differences effect before and after swimming on ASD children meltdown.

Table 1: Pair t-test result of four broad content areas: behavior expression, interactional context, trigger and anger regulation (n = 25)

Component in questionnaire	Mean	SD
Pre & Post Behavioural Expression	1.06286	0.45751
Pre & Post Interactional Context	0.80000	0.59512
Pre & Post Triggers	0.90400	0.45505
Pre & Post Anger Regulation	0.77000	0.38978

From the table 1 it showed that four component areas in questionnaire: pre and post of behavior expression, interactional context, trigger and anger regulation, had significant effect on reaction of meltdown of autism kids ($p < 0.05$).

Discussion

The results of this study found that there were significant differences between before and after swimming effects towards ASD children meltdown reaction in children with autism in each components of the questionnaires. This study was supported by previous studies conducted by Huettig and Darden-Melton (2004) that swimming program have improvements behaviour skills.

In this study, children with autism experienced swimming program were arranged to decide the impact of swimming in diminishing meltdown in children with autism. Results showed that swimming said to decrease meltdown by measuring the score rate of the meltdown in the MAP-DB 's survey. Moreover, the results of the current study consistent with past studies conducted by Yilmaz et al., (2004), Huettig and Darden-Melton (2004) found that children with autism appeared there were an increasing of scores on water introduction skills, breathing abilities, floating skills, swimming skills such as stroke over certain period of program.

The result from Yilmaz et al. (2004) demonstrated that their skill related fitness such as balance, speed, agility and power scores of children with ASDs rise after 10 weeks swimming program. In addition, the duration of tantrum has decreased at least 6 minutes over 45 minutes of swimming training that included behaviour of spinning, rocking, and delayed echolalia. This could be benefit for the positive social interaction of others.

The effectiveness of treatments within the aquatic environment have been credited with water properties of buoyancy, hydrostatic weight, and thermodynamics (Dale, Macdonald & Messer, 2005). It also demonstrated that aquatic treatment can be an assistance to enhance the development of deficiency of ability for people who incapacities, or disorders (Jake, 2003). The properties of water can enhance further on sensory stimulation, motor skills, social interaction abilities, self-awareness, and involvement play with others.

Apart from that, the used of aquatic exercises had been known to cater physiological benefits such as body coordination and movement, perceptual and spatial mindfulness, and a strong cardiovascular (Broach & Dattilo, 1996). The psychological mental could be gain from aquatic exercises integrate self-esteem and body picture and decreasing nervousness among children with ASD (Vonder Frames et al., 2006). As the reported incidence of ASD in children grows to rise, a well and fully guided by practitioner to focus on the limitation of sensory motor among children with ASD typically encounter (Case-Smith & Arbesman, 2008). The benefits in the water may give different impact in terms of sensory stimuli, proprioception, respiratory abilities and self – regulation compare with in land based activities.

Conclusion and Recommendation

The findings of this study suggested that practitioners and clinicians gained multiple benefits from the use swimming method with autism kids. It implied that it was one the effective method in examining meltdown reaction among children with autism. At this point, once examined the aspects of the relationship between sports and autism, it could be considered physical and sports activity as a real opportunity for improvement for these subjects in different perspectives.

Apart from that, future recreational programs should use pre-existing education settings to create and establish more opportunities for children with autism. Interventions aimed at maximizing. Swimming in children with autism should be designed to incorporate the multiple levels of factors of the sociological model.

Future work to be done the sample size which was big sample size which may give a variety of result from the study area. A study with physical therapists and parents of children with autism provided a more comprehensive view of the perceived benefits. The period of the classes should be same because it might be influenced the finding.

References

- Abrahams, B. S., & Geschwind, D. H. (2008). Advances in autism genetics: on the threshold of a new neurobiology. *Nature reviews genetics*, 9(5), 341.

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.
- American Red Cross. (2009). American Red Cross: *Water safety instructors manual*. (3rd ed.) Yardley, PA: Staywell.
- Auxter, D. P. (1997). *Principles and methods of adapted physical education and recreation* (8th ed.). St. Louis, MO: Mosby.
- Auxter, D., Pyfer, J. & Huettig, C. (2005). *Principles and methods of adapted physical education and recreation*. Columbus, OH: McGraw-Hill.
- Broach, E., & Dattilo, J. (1996). Aquatic therapy: a viable therapeutic recreation intervention. *Therapeutic Recreation Journal*, 30(3), 213-229.
- Case-Smith, J., & Arbesman, M. (2008). Evidence-based review of interventions for autism used in or of relevance to occupational therapy. *American Journal of Occupational Therapy*, 62, 416-429.
- Dale, R. B., MacDonald, J., & Messer, L. (2005). Liquid assets. *Unknown Journal*, 18(3), 22-24.
- Del Rincon, P. N. (2008). Autism: alterations in auditory perception. *Reviews in the Neurosciences*, 19(1), 61-78.
- Folkins, C. H. (1981). Physical fitness training and mental health. *American Psychologist*, 36(4), 373-389.
- Huettig, C., & Darden-Melton, B. (2004). Acquisition of aquatic skills by children with autism. *Palaestra-Macomb Illinois-*, 20(2), 20-25.
- Jake, L. (2003). Autism and the role of aquatic therapy in recreational therapy treatment services. *Therapeutic Recreation Directory*.
- Kong, X., Chen, L., & Wang, X. (2012). Future directions in autism treatment. *NA J Med Sci*, 5(3), 185-188..
- Lang, R. O. (2009). Enhancing the effectiveness of a play intervention by abolishing the reinforcing value of stereotypy for a child with autism: A pilot study. *Journal of Applied Behavior Analysis*, 42, 889-894.
- Lepore, M., Gayle, G., & Stevens, S. (2007). *Adapted aquatics programming: A professional guide*. (2nd ed.). Champaign, IL: Human Kinetics Publishers.
- Lyll, K., Schmidt, R. J., & Hertz-Picciotto, I. (2014). Maternal lifestyle and environmental risk factors for autism spectrum disorders. *International journal of epidemiology*, 43(2), 443-464.
- Pan, C. (2009). Age, social engagement, and physical activity in children with autism spectrum disorder. *Research in Autism Spectrum Disorder*, 3(1), 27-31.
- Pan, C., & Frey, G.(2006). Physical Activity Patterns in Youth with Autism Spectrum Disorders. *Journal of Autism and Developmental Disorders*, 36(5), 597-606.
- Pan, C. Y., Tsai, C. L., & Chu, C. H. (2009). Fundamental movement skills in children diagnosed with autism spectrum disorders and attention deficit hyperactivity disorder. *Journal Of Autism And Developmental Disorders*, 39(12), 1694.
- Prupas, A. & Reid, G. (2001). Effects of exercise frequency on stereotypic behaviors of children with developmental disorders. *Education and Training in Mental Retardation and Developmental Disorders*, 36(2), 196-206.
- Rosenthal-Malek, A. & Mitchell, S. (1997). The effects of exercise on the selfstimulatory behaviors and positive responding of adolescents with autism. *Journal of Autism and Developmental Disorders*, 27(2), 193-202.

- Vonder Hulls, D. S., Walker, L. K., & Powell, J. M. (2006). Clinicians' perceptions of the benefits of aquatic therapy for young children with autism: A preliminary study. *Physical & Occupational Therapy in Pediatrics*, 26(1-2), 13-22.
- Yanardag M, Akmanoglu N, Yilmaz I. The effectiveness of video prompting on teaching aquatic play skills for children with autism. *Disabil Rehabil.* 2013;35(1):47–56
- Yilmaz, I., Yanardağ, M., Birkan, B., & Bumin, G. (2004). Effects of swimming training on physical fitness and water orientation in autism. *Pediatrics International*, 46(5), 624–626. <https://doi.org/10.1111/j.1442-200x.2004.01938.x>