

# Easy and Inexpensive Intervention for Parents? Physical Activity Interventions in Children with Autism Spectrum Disorder in Indonesia: Literature Review Study

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# Easy and Inexpensive Intervention for Parents? Physical Activity Interventions in Children with Autism Spectrum Disorder in Indonesia: Literature Review Study

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## 24 STRACT

The prevalence of children with autism spectrum disorder in Indonesia is currently predicted to continue to increase, while the treatment of children with autism spectrum disorder needs to be done early to get optimal results in overcoming some of the problems they experience. However, the fact is that currently many parents are experiencing economic limitations and skills in providing appropriate treatment for their children. In overcoming these problems, a form of intervention is needed that can be carried out by parents without large costs, without special skills that must be possessed, and easily accessible to parents, especially in Indonesia. One of the interventions that can be used is physical activity interventions. The purpose of this study is to summarize the description of physical activity interventions applied to children with autism spectrum disorder in Indonesian research. This research was conducted using a literature review research method, using two research articles that had previously existed in Indonesia, by using a literature review research method on two articles that related with the topics with a total of 12 participants. It was found that the physical activity intervention that can be modified according to the child's condition and using the ball assisting media when playing, namely the modified soccer intervention and modified basketball which was carried out for six intervention sessions for autism spectrum disorder children, could improve the ability of social interaction in children with autism spectrum disorder in Indonesia.

**Keywords:** *Autism Spectrum Disorder, Physical Activity, Literature Review.*

## 13 1. INTRODUCTION

Autism spectrum disorder is a disorder that occurs in neurodevelopment, which is characterized by difficulties in social interaction, communication and behavioural patterns, such as interests, limited and repetitive activities [2].

The American Psychiatric Association explains that autism spectrum disorder consists of several disorders as defined by a deficit in a person's behaviour and social interactions, which can affect interpersonal relationships in children so that it has an impact on their social environment such as parents, siblings, and other peers. Communication problems experienced are verbal and nonverbal such as problems with eye contact, facial expressions, and gestures [3].

Based on information on epidemiology, it was explained that information about the frequency in recent years for a person with autism spectrum disorder throughout the US and non-US countries, which is almost close to 1% of the existing population, is estimated to be the same in samples of adults and children. Onset in autism spectrum disorder, symptoms can begin to be recognized, namely during the second year of life in children, which is in the age range of 12-24 months, but sometimes symptoms can be seen earlier, starting from 12 months of age if the developmental delay that occurs in children is severe and also can be seen more than 24 months if the symptoms shown by the child are more subtle. Onset that appears in children can be seen by the occurrence of early developmental delays in children or there are problems experienced in social or language

skills experienced by children. Based on (American Psychiatric Association, 2013), there are several prognostic factors in Children with autism spectrum disorder, namely the environmental which there are several non-specific risk factors, such as age in parents, low birth weight of children, and the possibility of fetal exposure to valproate which can affect the risk of autism spectrum disorder. The other one is genetic and physiological, the herability in autism spectrum disorder occurs with a large presence of 37% to 90% [2].

Based on the DSM-5, autism spectrum disorder is more specified with a spectrum from mild to severe. A person is given a diagnosis based on the presence or absence of the defining features in the clinical description. Some of the defining features included intellectual problems, structural language disorder, association with other conditions (medical, genetic, or environmental), and other neurodevelopmental, mental, or behavioural disorders, whereas before DSM 5 was published it was according to the DSM-IV diagnostic criteria [11].

There are different types of autism spectrum disorder which include "Autistic disorder, Asperger's disorder, and Pervasive Developmental Disorder-not otherwise specified (PDD-NOS)". Based on the comparison of developments from DSM-IV to DSM-5. An example of this comparison is the difference in diagnosis from the past to the present. As with the case previously diagnosed as Asperger's Disorder according to the DSM IV TR diagnostic criteria, but currently will be diagnosed as Autism Spectrum Disorder without any language or intelligence disorders [11].

Paediatrician, Dr. Widodo Jadarwanto predicts someone with autism spectrum disorder will continue to experience an increase. In Indonesia, 1 in 250 children experienced autism spectrum disorder in 2015, and there are around 12.800 children with autism spectrum disorder in Indonesia. Currently, there is still no accurate data in Indonesia regarding the number of children with autism spectrum disorder each year [8].

In 2015, the Director of Mental Health Development at the Ministry of Health of the Republic of Indonesia also explained that Indonesia still lacks professionals or health workers, and has not been able to meet the WHO minimum quota requirements. The distribution of health services in Indonesia is still uneven, and most of them are still concentrated in big cities on the island of Java [5].

Currently, many children with autism spectrum disorder in the area are brought to Jakarta to get treatment from a professional because of the lack of care and professional staff in their area of origin, according to Melly Budhiman, who is an autism expert and chairman of the Indonesian Autism Foundation [10].

Economic limitations are also one of the obstacles for parents in helping their children's development. As happened to Mrs. Esti in article [4] who is a mother who has a child with autism spectrum disorder. Limitations regarding the costs she experienced prevented her from meeting the needs of her child when doing therapy by a professional, because it required quite expensive costs to carry out diagnostic tests and therapeutic programs for children with autism spectrum disorder.

Early treatment for Autism Spectrum Disorder is very important because proper treatment can reduce individual difficulties and help them learn new skills and maximize their strengths [7], but the reality is that currently the limitations experienced by parents make this treatment difficult.

Currently there are various kinds of treatment that can be done to deal with the problems experienced by children with autism spectrum disorder, one of the treatments that can be done by parents is by doing physical activity. The intervention is expected to be able to handle the problems experienced by children with autism spectrum disorder.

Physical activity is defined as any activity that can burn calories in the human body, these activities can cause a person's body to work harder than usual, by involving movements freely and voluntarily [13].

One form of physical activity is sports, but besides sports there are also several other forms of physical activity. Some examples of other forms of physical activity that a person can do on a daily basis are gardening, dancing, just walking with a pet dog, shovelling snow, and sweeping [13].

The physical activity used in this study itself is an activity that can be carried out by parents without large costs, without any special skills possessed and easily accessible by parents, as physical activities that have therapeutic values in children with autism spectrum disorder.

Another feature or benefit when a children with autism spectrum disorder performs physical activity is that physical activity can play an important role in hormone regulation, which can affect brain circuits involving various neurotransmitters [9].

Based on the description above, it can be seen that physical activity interventions provide many benefits, especially for children with autism spectrum disorder. The aim of this study was to find and summarize an easy and inexpensive physical activity intervention for parents of children with autism spectrum disorder in Indonesia with review a few of related research articles.

## 2. METHOD

The literature review was compiled by searching for research in Indonesia on Google Scholar using the keywords "Physical Activity" and "Autism Spectrum Disorder". The researcher decided to use two research articles to summarize, namely research by Ma'ruf and Pamuji [6] and research by Alhuda and Ainin [1].

In this study, there are several inclusion criteria in the research articles used for review, such as being able to use Indonesian or English, the research was conducted in Indonesia, the research is a published research article, the participants in the research article are children with autism spectrum disorder, physical activity interventions used in this study is a physical activity that is easy and inexpensive to do by parents with children with autism spectrum disorders.

The exclusion criteria in this study were research articles conducted outside Indonesia, research articles inaccessible or unpublished, research articles using languages other than Indonesian or English, participants in research articles being adults, research articles, activity interventions the physical activity used in the research article is a physical activity intervention that is difficult to do in Indonesia and requires special instructors or is expensive to do.

The two studies were chosen by the researchers because they used physical activity interventions that were quite common, easily accessible, inexpensive, and popular in Indonesia, namely the modified ball physical activity intervention [6] and modified basketball [1]. In outcomes, the main results assessed are behavioural aspects as well as interaction and communication in accordance with the diagnostic criteria for children with Autism Spectrum Disorder in DSM V after physical activity interventions with a certain intervention duration are given.

## 3. RESULT

The research articles used are research by Ma'ruf and Pamuji [6] and Alhuda and Ainin [1]. Both studies used the same research method, namely the pre-experimental quantitative research method with one group pre-test and post-test research design. Both of them also used six participants each with a diagnosis of autism spectrum disorder and if the total was added in this study, there were 12 participants.

In the study by Ma'ruf and Pamuji [6] the participants used were in the preschool age range to the age of six years, while in the study by Alhuda and Ainin [1] the participants used were children with grades III-V Elementary School.

The purpose of these two studies is the same, to describe of children's social interactions after being given

an intervention, both studies use the ball as the media to help in playing it, but by using two different physical activity interventions, namely modified soccer [6] and modified basketball [1] with the same number of intervention sessions, six intervention sessions.

Research by Ma'ruf and Pamuji [6] which conducted research on six autistic students, namely with two autistic children who were hypoactive, three participants were quite passive children who liked to be alone, the other was an autistic child who was quite active but had obstacles in following instruction on learning activities at the Cita Hati Bunda Sidoarjo Foundation using modified soccer physical activity interventions. Modified soccer intervention is given by adjusting the child's ability to changes in place, duration, and rules with the aim of increasing social interaction in autistic children.

Ma'ruf and Pamuji's research [6] in the pre-test phase showed that before the intervention was given, the results were low in social interaction but increased after the intervention was given.

The results showed that children were able to cooperate when playing modified ball and children showed their ability to compete while playing with their team, besides being influential in aspects of social interaction, the results also showed that children's self-confidence increased when interacting and socializing with other people. People in the surrounding environment such as their peers or teachers [6].

Alhuda and Ainin [1] in their research conducted on six autistic children who have several problems such as difficulties in social interaction with friends around which are shown by children in their daily activities such as, difficult to share with friends, low desire to help friends when doing assignments, and wanting to play with friends around him during break time at his school (SLB Sinar Harapan Probolinggo) was also low.

First, the pre-test phase was carried out to determine the social interaction ability of autism spectrum disorder children before being given the intervention, then in the treatment phase, six meetings were carried out by providing a modified basketball intervention carried out at school. In the last phase, the post-test was conducted to determine the child's social interaction ability after being given an intervention by conducting one meeting. The assessment was carried out twice, before and after the intervention was given [1].

In other physical activity interventions, namely using a modified basketball in the study by Alhuda and Ainin [1]. The games that have been carried out have been adjusted and simplified in terms of players, where to play, the field, the equipment in playing such as hoops and basketball, and the duration of time in play. The game is only done by throwing the ball to a friend in the team and then putting it into the ring, with three members in one team with the aim of making it easier for children to

communicate and interact well with each member during play. Overall the results show that there is a significant increase in children's social interactions in terms of communication such as when greeting friends, answering friend greetings, saying and answering greetings, and behaviour carried out in groups such as in collaborating with their team, as well as the desire to share objects with others. friends during the learning process has started to look high.

The two studies used for the assessment, both use two forms of physical activity whose rules of play have the same characteristics, which must be carried out in teams, namely on physical activity from soccer and basketball.

This is in line with the definition of social interaction by Soerjono [1] that social interaction is a dynamic relationship between individuals or groups. This explains that when two people meet, social interaction automatically begins at that time, it can be in the form of talking to each other, reprimanding, shaking hands, or even fighting each other, but it is the same thing, namely doing each other in the form of social interaction.

This is in line with the improvement of the problems experienced by children with autism spectrum disorder, because when children perform physical activities that must be carried out in teams, in this case, physical activity from soccer and basketball, children are required to play with other people so that a problem will arise. Social interaction between friends and children will work together among members in their team to achieve goals in these activities together. Thus, the child's ability to carry out social interactions will be honed. While doing physical activity, children are required to play together with people around or peers in forming opportunities for children to communicate with others, which can be beneficial for social interaction skills in children [12].

These physical activity used here is also a physical activity that have been modified, adapted, or simplified to the abilities of children with autism spectrum disorders such as changes in tools, duration, or other rules that are applied to make it easier for children to carry out these activities but still with the aim of improving communication and interaction of children. Physical activity that is modified in some of the physical activities studied in this study which is applied in Indonesia, especially in small areas which is in line with the problem of the phenomenon in Indonesia, can use several alternatives, such as when parents want to apply physical activity from basketball and soccer. Parents can change the ball media by using balls made by parents themselves using rounded waste paper, rounded cloth or socks or parents can use plastic balls or rubber balls which are of course much cheaper and also easy to find. Parents can also modify the ball from its size, adjusted to the child's biological development or age, if the child has difficulty holding a large ball so that parents can modify it using a small ball.

Based on the discussion on the effectiveness of physical activity interventions for children with autism spectrum disorder, it can be concluded that physical activity interventions have proven effective in improving problems in communication and interaction aspects as well as behavioural problems experienced by children with autism spectrum disorder. 10

However, it should be reiterated that this is just a research, in research the time used for intervention is of course quite limited due to the limitation of research time and the needs and conditions of each children are different, with the suggested time span in some studies studied in this study may be can be effective or not in some children, because the problems experienced by children with autism spectrum disorder are problems that have existed since the child was born and there are some problems with the brain, the neurological development of children is different from other normal children, so researchers suggest parents to be able to carry out these physical activities themselves in the long term, with a longer span of time and duration to get maximum results, maybe not to eliminate but rather to be able to reduce or control the problems experienced by their children. with autism spectrum disorder.

The two studies used here have some limitations, the limitations in this study are the researchers did not explain the severity of children with autism spectrum disorder as participants in this study, because the severity of the study of children with autism spectrum disorder may also affect the effectiveness of the intervention and both studies also does not explain the range of intervention sessions in more detail. In this study, all studies examined only used one group without a comparison group, namely by using a single subject research design or one group pre-test post-test design. This may be done because the participants in this study are children with special needs, so that the physical activity interventions given to the participants cannot be generalized to each other because children's abilities can vary, so it will be difficult if there is a comparison group in seeing differences in the effectiveness of activity interventions. physical activity in children with autism spectrum disorder in each study.

#### 4. CONCLUSION

Physical activity interventions that can be modified according to the child's condition, using the media as a ball aid, and carried out in teams, namely the modified soccer intervention and modified basketball which were carried out for six intervention sessions for children with autism spectrum disorder, can improve social interaction skills. in children with autism spectrum disorder in Indonesia. Therefore, the type of physical activity that is modified from soccer and basketball can be a suggestion for the type of physical activity that can be applied by parents to children with autism spectrum disorder

anywhere because the effectiveness of these two types of physical activity has been proven to be effective and has a good effect on children with autism spectrum disorder and become a type of physical activity that is quite common and easy to do, especially in Indonesia.

Both of these activities have also been proven effective in improving the problems experienced by children with autism spectrum disorder and have high therapeutic values. Such as being able to increase children's confidence in interacting and when socializing with the environment around children such as friends and teachers, can train children's concentration, can increase children's interest in doing movement activities that make children not passive and do not prefer to be alone anymore.

Parents can change the ball media by using balls made by parents themselves using rounded waste paper, rounded cloth or socks or parents can use plastic balls or rubber balls which are of course much cheaper and also easy to find. Parents can also modify the ball from its size, adjusted to the child's biological development or age, if the child has difficulty holding a large ball so that parents can modify it using a small ball, because the purpose of this study is to carry out an intervention of physical activity that is inexpensive and easy to use by parents in Indonesia, especially parents who have economic limitations, so that modifications to physical activity can make it easier for parents to do with their children.

In this study, the researcher has several limitations, in this study, researchers only used two articles for review, so that researchers could not see the differences more widely. Researchers have several suggestions that can be done by further research, namely in future research it is expected to be able to conduct literature review research by focusing more on the results of changes in children with autism spectrum disorder in all aspects of the problems experienced by children with autism spectrum disorder as well as combining research results to see changes in communication and interaction, behaviour, motor skills.

Further research is also expected to be able to examine the relationship between ambidextrous and the effectiveness of physical activity in children with autism spectrum disorder, to see whether there is an effect or not. In future research, it is also expected to be able to continue research to the next research stage, namely by using meta-analysis research methods to get an overview of research results based on analysis of quantitative research methods by adding more research articles reviewed. Future research is also expected to be more considerate of other factors that may influence the results of the study such as additional therapy that participants may be taking, participants' IQ, and other factors that may affect the results of the study.

## AUTHORS' CONTRIBUTIONS

RBN, HS, and NS designed the study. RBN conducted the data analysis and wrote the manuscript. HS and NS supervised and revised the manuscript.

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