



The Effect of Physical Activity on Physical Fitness in Early Childhood

Review Article

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Abstract

In the era of digital life, it provides convenience in various aspects of life. Children familiar with gadgets tend to prefer playing with them or choosing to watch. This raises sedentary behaviour in children so that children do less physical activity and can trigger other diseases such as obesity, type 2 diabetes, respiratory, psychological, etc. This research is a literature study that discusses the effects of physical activity on children's health. The primary literature consists of 15 national and international journals. The results showed that physical activity has a positive effect in terms of health and academics.

Keywords: *physical activity, physical fitness, adaptive exercise*

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INTRODUCTION

Many health problems arise due to a lack of physical activity. Technology has significantly influenced lifestyles [1]. The development of technology today has a negative side [2], as most children prefer to play with gadgets [3] and stay at home [4]. Sedentary behaviour is characterized by an energy expenditure of 1.5 metabolic equivalents from sitting or lying down [5]. Many children have healthy lifestyles and vice versa [5]. Children's activity patterns change from kindergarten (3-5 years) to late school (9-10 years), with high volume, less activity, and more sedentary behaviour. At this time, moderate to high physical activity did increase slightly, but sedentary behaviour was also higher [6].

Those who often do physical activity have good physical health and reduce the risk of other diseases in children's bodies [7]. Lack of physical activity causes obesity [1]. Obesity is a disease that is still a big problem in many countries. Based on the 2007-2018 RISKESDAS, the issue of obesity in Indonesia in school-aged children aged 5-12 years has increased by 6.4%. Data for 2013 showed that obesity was 8.8%, and in 2018, it reached 9.2% [8]. Apart from Indonesia, one-third of children in the United States are obese [9].

Physical activity for children is vital. Physical activity can minimize diseases arising from a lack of physical activity. There are still many misconceptions about the importance of physical activity for children, especially parents with small children. Low physical activity in children must be addressed immediately [10]. One of the children's growth and development can be seen in their

motor development. Every child has different motor skills. Children with high mobility will find it easier to carry out their movements. Helping children get used to moving properly is necessary as a basis for forming children's physical activity behaviour so that children can get used to physical activity later [2].

Health problems are indeed a big problem in various countries and are still trying to reduce the level of health problems, especially at the age of children. Can physical activity play a role in this effort? This study intends to determine the effect of physical activity on the health of the child's body. This research is based on previous research that has a similar topic.

MATERIAL AND METHODS

This research is literature review research. The sources for the articles in this study were obtained from Google Scholar, Springer Link, ResearchGate, Crossref Search, and Sage Journal sites. Referring to the keywords physical activity, physical fitness, and childhood. After conducting a literature review, 15 national and international articles relevant to the research topic were obtained. The data used in this research is secondary data. This secondary data is taken from articles published in the last seven years. Literature was selected through several stages, namely: (1) The initial stage of searching for articles on the topic of Physical Activity, Physical Fitness, and Childhood; (2) Reviewing articles; (3) Further analysis of the selected articles; (4) Writing conclusions [11]. The secondary data collection process can be described as follows:

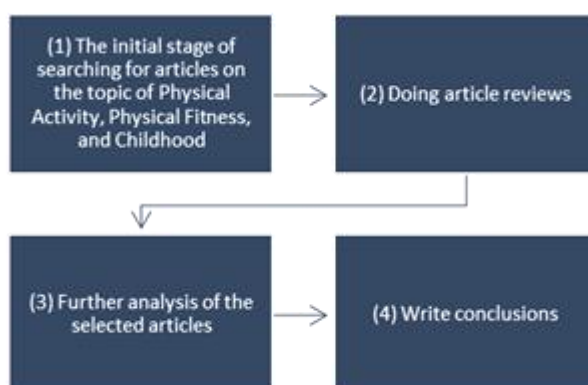


Figure 1. Secondary Data Collection Stage

RESULTS

The effect of physical activity on children's physical fitness is still an interesting topic to discuss, as evidenced by the many websites, books, articles, and others that discuss physical activity and physical fitness from a health and academic point of view. The more research done; the more evidence supports the assumption that physical activity is important. Any physical activity can be done rather than not doing it at all [12]. The truth of an assumption needs to be proven to make it more reliable. The researcher selected 15 primary literatures from national and international articles to verify the hypothesis that physical activity affects physical fitness—the entire article results from previous research discussing physical activity, physical fitness, and childhood. The substance of the article can be seen in Table 1.

Health can be influenced by many factors, including physical activity [13]. Based on the results of previous studies, the assumption that physical activity positively impacts children's bodies is valid [14]. Physical activity affects children's fitness, has long-term effects on health, and shows that there is indeed a need for increased development and evaluation that focuses on children [15]. Physical fitness possessed by children will provide mental, emotional, physical, and psychological maturity so that children can achieve the expected learning achievements [16]. Appropriate and moderate physical activity will provide good feedback for the child's body, the intensity of physical activity also affects the benefits the body gets [17] & [18]. Other studies also

recommend being able to do physical activity for 60 minutes [18] & [9]. We know that in carrying out physical activity, it is necessary to pay attention to the frequency, intensity, duration, and type of physical activity, which is often known as FITT (Frequency, Intensity, Time, Type), especially in children [19].

The school period also contributes to children's physical activity. Increasing children's physical activity is one thing the education system supports [19]. Adequate facilities and infrastructure and good quality educators will be able to increase children's interest in physical activity [20]. Most children have a lot of time at school, so the habit of being physically active during school time will form the basis of a healthy life in the future [21]. In addition to the school environment, the family plays an important role in attention to children's activities. Family, the surrounding environment, and the school environment are indeed one of the factors in children's silent behaviour [22]. In today's technological era, children will also prefer watching and playing with gadgets. Excessive screen time habits in children can hinder their cognitive development, so they must be limited. By paying attention to children's time watching and playing with gadgets and paying attention to children's physical activity, the habit of being silent, the child's health, psychological and social, will be good [23].

Table 1. Research article literature data

No	Title	Publishing Year & Authors	Source	Methods	Findings
1.	Health-Related Physical Fitness and Physical Activity in Elementary School Students	W. Chen et al., 2018 [9]	BMC Public Health	Descriptive Statistic, Univariate Analyses, and Multiple R-squared Liner Regression Methods	Overall, students have good physical activity when at school compared to outside school
2.	Physical Activity in Adolescents and Children and Relationship to Metabolic Health	Whooten et al., 2019 [24]	Wolters Kluwer Health	Literature Review	Physical activity has a positive influence on the metabolic health of children and adolescents
3.	The Different Effects of Physical Activity Before and After School Toward Physical Fitness and The Ability of Social Interaction in Gajah Mada Medan Primary School Student	Dewi et al., 2020 [25]	Redwhite Press	Experimental Research with two groups of pre-test and post-test designs	Physical activity before and after school provides benefits for the child's body and social life
4.	The Influence of Sports and Physical Exercise Models on Adolescent Physical Fitness: Literature Review	Pranata & Kumaat., 2022 [13]	Jurnal Kesehatan Olahraga	Literature Review	Eight out of 10 studies reviewed said there was an increase in physical fitness after doing sports and physical training models
5.	Effect of the Resistance Exercise on Elementary School Students' Physical Fitness	Fu et al., 2019 [26]	Journal of Science in Sport and Exercise	Experimental Research	The study's results said that the child's physical condition improved significantly even though the effect of the increase was weak and moderate. Females show higher cardiorespiratory endurance than males

6.	Early Childhood Physical Activity and Sedentary Behavior in Indonesia: Objectively Measure Using Accelerometer	Suherman et al., 2020 [27]	Atlantis Press	Quantitative Descriptive	The study results show that children in Indonesia who live in urban areas spend more time sedentary than rural children. However, the study results said there was no difference in physical activity between urban and rural children. These results are different from previous studies in Taiwan. The results of research in Taiwan, urban children are more active than rural children. Children in urban areas are more involved in winter, and children in rural areas are more active in summer. Environmental and cultural factors influence the difference between the two results.
7.	The Developing Brain: Considering the Multifactorial Effects of Obesity, Physical Activity & Mental Wellbeing in Childhood and Adolescence	Logan & Ward-Ritacco, 2022 [28]	Preprints	Review	Physical activity and increased fitness can improve brain function, mental health, and obesity in adolescence, but more research is needed to clarify the implications and details of overall health
8.	Effects of Physical Activity on Children's Motor Skill Development: A Systematic Review of Randomized Controlled Trials	McDonough et al., 2020 [29]	BioMed Research International	Literature Review	The results of this study support previous research where the results showed that there was an effect of physical activity on children's motor skills
9.	The Effect of Daily Physical Activity on Increasing Physical Fitness and Academic Achievement of Elementary School	Chabibi Arif et al., 2021 [30]	Budapest International Research and Critics in Linguistics and Education (BirLE) Journal	Quasi-experimental with a matching-only design	After conducting research for two months, the results showed that daily activities proved effective in increasing physical fitness and student achievement
10.	A systematic review of the relationships between objectively measured physical activity and health indicators in school-aged children and youth	Chaput et al., 2016 [31]	NRC Research Press	Systematic Review	This study aimed to determine the relationship between PA on physical, psychological/social, and cognitive health. PA with high intensity has more consistent and more substantial results in terms of health than PA with low power. These results support the PA recommendation that needs to be done at moderate and high intensity for 60 minutes per day. PA with measurable duration, passion, and frequency will show the effects of PA on

					physical, psychological/ social, and cognitive health
11.	A Natural Experiment of state-level physical Activity and screen-time policy changes early childhood education (ECE) Centers and child physical activity	Kracht et al., 2020 [32]	BMC Public Health	Experimental, Pause and play study	This research was conducted for a year where the results of the initial research on children's physical activity decreased, a year later showed that the level of children's physical activity increased, screen-time and silent or sitting behaviour of children decreased and children carried out physical activity more often.
12.	Poor physical activity levels and cardiorespiratory fitness among patients with childhood-onset Takayasu arteritis in remission: a cross-sectional, multicenter study	Astley et al., 2021 [33]	Springer BMC Pediatric Rheumatology	Cross-sectional, Multicenter study	This research was conducted for a year, and the initial study's results on children's physical activity decreased. A year later showed that the level of children's physical activity increased, screen time and silent or sitting behaviour of children fell, and children carried out physical activity more often
13.	Effect of the home-exercise program in childhood survivors of acute lymphoblastic leukemia on physical fitness and physical functioning: the result of a randomized clinical trial	Manchola-Gonzales et al., 2020 [34]	Supportive Care in Cancer	Experimental	The results showed changes in VO ₂ peak, VE, VCO ₂ , and function capacity during daily activities (TUDS and TUG tests), where this program has a good effect on physical fitness
14.	Tracking of objective physical activity and physical fitness in Japanese children	Sasayama & Adachi, 2019 [35]	BMC Research Note	Survey	The total physical activity of boys is higher than that of girls. During adolescence, boys are more physically active than girls. However, the results of research on the physical fitness of boys and girls are at moderate and high levels from childhood to adolescence
15.	A Large-Scale Reanalysis of Childhood Fitness and Inhibitory Control	Raine et al., 2018 [36]	Journal of Cognitive Enhancement		Physical fitness has positive benefits for the brain, child behaviour, and public health implications as the role of childhood physical activity in aspects of cognition that underlies academic achievement and effective functioning throughout life

DISCUSSION

This study discusses research on the effects of physical activity on children's physical fitness. Many studies have proven that physical activity does have many benefits for children. If

you are used to doing physical activity from a young age, when you are an adult, you will also do the same thing and will feel the benefits when your child becomes an adult [27]. Physical activity is often assumed to be an activity that provides many benefits for children [24]. Many studies have shown that physical activity in children will have a good effect on children [17] & [26] such as reducing the emergence of non-communicable diseases in the body, including type 2 diabetes [3], obesity [37] & [28], cardiorespiratory [18], cancer [38], can improve psychological [39] & [4], physiological, improve children's cognitive function and academic achievement [40] and others.

Previous studies show that physical activity is not only beneficial for physical fitness. Physical activity has broad benefits, namely on the physiological, cognitive, social, and academic of children. It is recommended for children aged five years to do physical activity for at least 180 minutes per day with any intensity [41]. American health standards recommend 120 minutes of physical activity per day. Still, the results of physical activity studies among children in daycare only show 27 minutes of moderate to vigorous intensity per day [42]. The Ministry of Health of the Republic of Indonesia (Kemenkes RI) in 2018 recommended for children aged 5-17 years to do activities for approximately 60 minutes. Other studies also suggest being able to do physical activity for 60 minutes [18] & [9]. The lack of physical activity in children has many factors that influence it, including parental concern that excessive child activity will disrupt sleep [44] and fear of injury to children. At the age of 3 years, children are more active on weekdays than on weekends. The physical activity of boys and girls increased by an average of 11% per year. The results of this study indicate that children's development is also supported from an early age by families and caregivers [45].

More physical activity in children can improve specific motor skills [46]. Practicing Fundamental Movement Skills (FMS) for preschoolers at least three times a week can improve skills, increase the intensity of physical activity (PA), and can reduce Sedentary Behaviour (SB) [47]. Children with low motor skills tend to be less physically active and have a low level of cardiorespiratory fitness [48]. Long-term studies in children have shown that decreased motor skills are associated with increased Body Mass Index (BMI) [48]. Physical activity can also improve the performance of cognitive functions. The components of cognitive function that are affected include attention, concentration, memory, psychomotor function, executive function, reasoning, verbal, numerical, and spatial factors [49]. Acute physical activity can have a direct positive effect [50].

Doing physical activity with friends of the same age is one way to get children involved in physical activity. In addition to increasing immunity, playing with peers will provide high social value for children. Children will not feel bored and reduce silence by watching or playing with gadgets. This social attitude is also believed to carry over into the future [51]. In addition to social benefits, creative physical activity increases academic achievement [52]. Adjusting children's physical activity can improve learning outcomes, such as raising children's creativity, working memory, and achievement [53]. Physical activity can also improve academic results in the long term [54] and can improve cognitive, social, emotional, and academic performance [10].

CONCLUSION

This research only focuses on the effect of physical activity on the child's body. There is much evidence that physical activity provides many benefits for children, but little has been discussed about the FITT (Frequency, Intensity, Time, Type) components in detail. For future researchers, it is hoped that they will examine in more detail what kind of physical activity children need to do.

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CONFLICTS OF INTEREST

Conflict of interest : Authors state no conflict of interest.

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