

Case Study Fine Motor Development Children: Developmental Coordination Disorder

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Abstract—The importance of fine motor development because children need to use hand skills. One of the causes of fine motor retardation is Developmental Coordination Disorder (DCD). The movements of children with DCD are often described as uncoordinated movements, and children often experience difficulties in activities and sports that usually develop where other children can do easily. The purpose of this study was to determine cases of impaired child development coordination. The research method used is qualitative with case study design. One child was involved in the study. The results of this study indicate that Developmental Coordination Disorder (DCD) affects several other aspects and developments at a later stage. Further research will be discussed.

Keywords—fine motor, developmental, coordination disorder

I. INTRODUCTION

The importance of fine motor development because children need to use hand skills such as eating and holding toys. Many daily activities require second-hand skills so children learn to manipulate toys or objects using their fingers, muscles, and visual perception [1].

Fine motor development is influenced by the times, where the average child spends more time using various media such as television, gadgets, and computers. This affects the lack of activity in children's fine motor usage. Children's fine motorbike must be sharpened well. The use of gadgets increased by an average of 30 minutes per day, unlike the previous five years [2], [3].

Given the importance of children's fine motor skills, prevention should be done so that this does not happen. Fine motor development can be hampered due to Developmental Coordination Disorder (DCD) [4]. Developmental Coordination Disorder is a neurological development condition characterized by poor motor skills that interfere with individual activities in everyday life, including academic achievement [5].

The movement of children with DCD is often described as an uncoordinated movement, and children often experience difficulties in activities and sports that usually develop where children can easily do so. However, the research did not explain in detail about the solution given. And our study explains the use of gadgets as a means to reduce Developmental Coordination Disorder in children's fine motor. Based on the background exposure mentioned above, the authors want to express / assess theoretically the use of iPad as a means to reduce Developmental Coordination Disorder in fine motor skills in early childhood.

The rest of this paper is organized as follow: Section II describes the literature review. Section III describes the proposed methodology. Section IV presents the obtained results and following by discussion. Finally, Section V concludes this work.

II. LITERATURE REVIEW

Research shows that there is a correlation between motor competence and physical activity. Children who are more physically active are more likely to show a higher level of motor skills than children who are not active [6]. Children's fine motor development is also affected by folic acid in food to increase the outcome of birth and postnatal growth and development. In addition, folic acid in reducing the risk of birth defects and women who receive preconception supplements of folic acid have good growth in fine motor development [7].

Fine motor skills are the use of small muscles involved in movement. McHale and Cermak's research states that children spend between 30% and 60% in school to perform fine motor tasks [8]. Children with strong fine motor skills show high academic performance.

A. Developmental Coordination Disorder

Developmental Coordination Disorder (DCD) or impaired developmental coordination in which conditions are characterized by delays in motor skills. This condition is a disorder that occurs in motor skills that are not suitable for the age of the child in general. Children who have this problem are usually considered 'clumsy' or awkward. The thing that happens when a child has this problem is that the child has motoric difficulties that interfere with learning and the implementation of motor-related activities, including children's fine motor development [9]. Motor difficulties will have a broad impact on health and quality of life, for example children with Developmental Coordination Disorder (DCD) are less physically active than their peers. Another impact is that children with DCD experience more cognitive difficulties and are at risk of being overweight and obese and this risk seems to increase in more severe motor disorders.

In line with that opinion, children with motor coordination problems such as Developmental Coordination Disorder (DCD), often experience challenges in carrying out motor activities where balance is needed [10]. Research conducted by Cacola, *et al.* in [4] describes the following criteria for the diagnosis of Developmental Coordination Disorder (DCD) such as (1) motor skills below the expected level and not like

the average ability of a friend. (2) difficulties in carrying out daily activities such as the ability to write / hold toys. (3) Occurs at the beginning of the development period; (4) motor difficulties that affect cognitive, visual disturbances, and neurological conditions that affect the movements that must be done.

Developmental Disorder Disorder (DCD) is a development of a neurological condition characterized by a significant reduction in motor competence in the absence of neurological or intellectual deficits. DCD affects around 6% of school-age children to significantly affect their capacity to do basic things, related to motorbikes in their daily activities. It is now well documented that the impact of DCD transcends the motorized domain of cognitive executive dysfunction and develops irregular affective, interpersonal and academic functions. Physical health of individuals with DCD increases the incidence of obesity, cardiovascular respiratory disease and arterial stiffness [11].

Millennium children are considered 'native digital' because they tend to learn in different ways because of exposure to different experiences for interactive learning environments. Technology can offer children the opportunity to participate in a pleasant learning environment. iPad technology is increasingly integrated into education and growing supporting evidence for the use of various technologies such as iPad and Nintendo. Technology has been used to improve different performance components such as balance of motor coordination and short-term visual memory. However, there is currently limited research on the use of iPad as a therapeutic tool for children with a lack of visual motor-sensory and motor skills [12].

Based on research found several facts entertainment-based entertainment activities are increasing rapidly, and the number of children who use tablet touch screens are increasing every year. Even some time is used to play tablets. In a recent report, the general media surveyed 1384 parents of children aged 0-8 years [13]. The researchers found that 52% of children aged 5-8 years accessed smartphones, iPads, tablets and other devices. 22% of parents see this as a 'temporary caregiver' and keep the child calm for a while. Touch screen tablets have become one of the most desirable gifts for children. Digital technology has changed the way children learn, play, and interact socially [14].

Without any intervention, children with DCD will not experience any improvement so in this case. To improve performance, children with DCD need to develop appropriate problem solving skills, such as the ability to identify and correct errors. The need to develop problem solving skills in children with DCD to enable them to improve their motor skills. Otherwise, impaired cognitive-motor function can limit their ability to benefit from interactions with the environment and compromise their psychosocial development. Thus, the use of iPad is used to reduce the risk of Developmental Coordination Disorders (DCD).

Results for the effects of fine motor skills training on arithmetic abilities, where arithmetic scores from the fine motor training group showed improvement after the 3-week intervention period, whereas in the control group no [15]. Furthermore, it appears that fine motor skills have a significant influence on arithmetic abilities. Use of technology in reducing fine motor problems. In conclusion, in the

widespread use of touch screen tablets may not be beneficial for the late development of school children, in addition to tablet use has a positive and negative impact on children [13]

Exploring suspected motor deficits between individuals with impaired coordination of development and defining DCD (etiology, neuropsychology, and brain base), motor learning (measurement of learning, methods to increase skill acquisition, practice and feedback [16]. In this study aimed at testing the effectiveness of summer camps in improving motor function and improving self-efficacy. which is significant in child satisfaction performance in summer camps. While no measurable changes in self-efficacy are observed but summer camps offer an alternative in improving functional skills of children with DCD [17].

Active video game guide (exergame) leads to learning y better and repetitive transfer of practice. The results of the study were two groups of participants (TD and DCD) increased and game performance. There are no significant differences in positive transfers to balance tasks between training schedules. Children with and without DCD learn quite well when playing [18].

III. METHODOLOGY

The type of research in children Developmental Coordination Disorders (DCD) is a case study. This study was conducted in April for 3 weeks. Research subjects who experienced fine motor development disorders were children with the initials ZA. ZA is one of the students in the Surakarta SLB B / TK group who experienced fine motor impairment.

Data collection methods in this interview are interviews and observations. Interviews are conducted to find out the condition of a child who has an obstacle.

IV. RESULTS AND DISCUSSION

TABLE I. INTERVIEWS

No	Questions	Answers Description
1	To what extent does ZA develop fine motor characteristics?	The difficulty of ZA in moving your hand, like when you want to draw or learn to write the letter
2,	what do you make a reference to detect interference experienced by ZA?	ZA's finger movement skills are not like his friends. There is a delay in participating in playing activities like friends.
3	Is ZA able to follow the learning well?	ZA sometimes enthusiastically follows learning activities, but several times the concentration is often disrupted so that it lacks focus. On the one hand, the responsible teacher must help keep the child's attention to the activities being carried out.
4	Does this DCD affect other aspects of development?	Yes, of course. Influence on cognitive, where ZA becomes more frequent and distracts and has difficulty concentrating
5	What do teachers do to help ZA in the learning process?	Additional teachers are ready to accompany ZA specifically. So the focus of class teachers is not divided in the conditioning of other children

Based on the Table I above, interviews that have been conducted, it can be analyzed as follows: with this DCD

disorder, the cognitive aspects of the child are also disrupted where the child becomes less focused and has more difficulty concentrating than his friends.

TABLE II. OBSERVATION

No	Instrument	description	Result
1	Speed	Children can complete tasks involving hands and fingers well	Children learn to write letters on iPad with a specified time limit
2	Accuracy	Children can position the finger correctly when holding the object	Children learn to coordinate fingers when writing letters
3	Agility	When doing activities, children can coordinate fingers and eyes at the same time	children learn focus writing
4	Accuracy	Able to coordinate eyes, fingers and wrists with perfect tasks and all the components he can do also produce products or complete work	Children learn to focus on the tasks given by the teacher

Based on the Table II, observation reports that have been carried out, observations are carried out based on instruments such as accuracy, agility, speed, and accuracy. These four aspects are used to measure motoric abilities of children with DCD disorders using iPad. Of course in these four things for children who experience DCD will be different from children who do not experience mild motor impairment.

V. CONCLUSION

To improve performance, children with DCD need to develop appropriate problem solving skills, such as the ability to identify and correct errors. The need to develop problem solving skills in children with DCD to enable them to improve their motor skills. Otherwise, impaired cognitive-motor function can limit their ability to benefit from interactions with the environment and compromise their psychosocial development.

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