Jurnal Ilmu Kesehatan, Volume 1, Nomor 2, Juli 2024,
E-ISSN 3047-8766
doi: https://doi.org/10.58222/jurik.v1i1.9846

THE ROLE OF MOTOR LEARNING IN STUNTED PREVENTION AND CENTRAL NERVOUS SYSTEM PERFORMANCE IN CHILDREN'S BRAINS

Reqgi First Trasia[1]✉, Gradiena Zisca Malengka[2], Syavira Soraya Kamal[3], Heru Firmansah[4] , Awaludin Rizki Kurnia[5]
[1,2,3,4,5]Fakultas Kedokteran, Universitas Sultan Ageng Tirtayasa

ARTICLE INFO

Article history
Submitted : 2024-06-07
Revised : 2024-06-22
Accepted : 2024-07-12

Keywords:
Completeness of forms, informed consent, surgery

ABSTRACT

The aim of writing this article is to educate the public that motor learning greatly affects children whose motor development is stunted and stimulates children's growth and development. Motor movements are movements carried out by children consciously and are influenced by stimuli from their environment such as verbal or verbal information, pictures and other tools to which children can respond. For example, related to efficient, precise and adaptive eye and hand movements. Developing fine motor skills or hand-eye coordination skills is an important part of motor development. Gross motor skills include locomotor patterns (movements that can cause movement), such as walking, running, jumping, kicking, going up and down stairs, and others. If the stimulus is insufficient or excessive and is also added with gross motor and fine motor movements that are not well developed, it can cause damage to the child's responsiveness which can lead to stunting.

✉***Corresponding Author:***

Reqgi First Trasia
Fakultas Kedokteran, Universitas Sultan Ageng Tirtayasa
Telp. 0815-1442-279
Email: Reqgi.first@untirta.ac.id

INTRODUCTION

Early age is a golden opportunity for children to learn, so it is called the golden age. At this age children have extraordinary learning abilities, especially in early childhood. Remembering that early childhood is the golden age, during this period we must be able to optimize children's development. Children's development at an early age has a holistic nature, that is, they can develop optimally if they are physically healthy, have adequate nutrition and are taught well and correctly. At an early age children will experience a period which is usually called the golden age, this period children become very sensitive and sensitive to various external stimuli and influences. During this period, children will experience drastic levels of development starting from motor, emotional, physical and social development. (Tarigan H, 2017)

This development usually occurs when children are 0-8 years old. At this age, children's motoric development can be developed well, children's motor skills can be stimulated with various kinds of motor learning models, developed from an early age because it will influence their future growth and development, so training children's motor skills, both gross motor skills and fine motor skills, needs to be done. stimulus with creative learning models. As the child grows older and is accompanied by lots of exercise, the movements that have been carried out will become more perfect if this is accompanied by the amount of food consumed according to the child's growing size. And the habit of eating nutritious food will affect bone growth and body posture. (Sutapa P, 2022)

Motor development is the development of physical movement control through coordinated nerve, muscles and bone activity. Motor development is a child's ability to move and control parts of

his body. Motor abilities are closely related to the development of control of body movements through coordinated activities between the nervous system, muscle and bones. (Aristanto F, et al., 2017)

Stunting is a problem in toddlers who have chronic malnutrition which is influenced by several factors, namely, inadequate nutritional intake during the growth period, mother's age during pregnancy, family education level, and exclusive breastfeeding. Stunting is a disruption in the growth and development of children due to chronic malnutrition and recurrent infections, which is characterized by their length or height being below standard. The effect of stunting on children's cognitive abilities varies greatly, based on several research results, stunting can affect children's thinking abilities. Stunting can also cause permanent damage to cognitive development, followed by suboptimal child intelligence. Stunting is one of the problems that has the highest percentage of health problems in Indonesia, because stunting can occur when a child is still in the womb. (Kusumawati E, et al., 2017)

Therefore, we want to conduct further research to determine the influence of the role of motor learning on preventing stunting and the performance of the central nervous system in children. Therefore, we are interested in conducting research on the influence of the role of motor learning on stunting prevention and central nervous system performance in children. The purpose of this article is to examine how the motor learning process can influence stunting and the performance of the central nervous system in children: (Munir RF, 2020)

1. The aim of the material on the role of motor learning in preventing stunting and the performance of the central health system is to reduce stunting rates in Indonesia, to support the health of students and Indonesian society as follows: Increasing public knowledge and awareness about the benefits and use of motor learning for children's growth.
2. Create so that people in Indonesia can more often teach their children to do motor skills and take care of the food their children consume at an early age.
3. Increasing the community to better maintain or regulate the nutritional intake that their children will consume and provide a balanced nutritional intake.
4. To reveal whether or not there is a relationship between motoric learning that influences stunting and the functioning of the central nervous system in children.

The targets to be achieved from the material on the use of motor learning in reducing the level of stunting and the functioning of the brain's nervous system in Indonesian children are: (Fikawati S, et al. 2018)

1. Create healthy children who avoid stunting and facilitate the functioning of the central nervous system.
2. There is an increase in the willingness or interest of the community to learn the function of motor learning to help reduce stunting rates.
3. Increase public knowledge of motor learning which can help the central brain nervous system work.
4. Helping Indonesian people who want to get married so they can maintain the nutritional intake they consume to maintain the condition of their children when pregnant and can prevent stunting when they are in the womb.

METHODS

The research method used to create this journal is conducting research using library studies or Literature Review. Systematic Literature Review Mathematical and statistical methods used to study and identify patterns of material use and analyze the development of a special literature. By using this literature study, researchers looked for information from various sources, namely from journal articles. From various sources in this journal, research reads, quotes and obtains information about the importance of motor learning in preventing stunting and the performance of the central nervous system in children.

RESULT

1. Understanding Motor Learning

Motor comes from the word motor which means the basic mechanics that cause movement to occur. This motor process involves a system of coordinated movement patterns (brain, nerves, muscles and skeleton) with a very complex mental process known as the movement creation process. Movements carried out by children are consciously influenced by stimuli from their environment (verbal or oral information, images and other tools) to which the child can respond. Below are various types of motor skills, including gross motor skills and fine motor skills, here are the explanations. (Tarigan H, 2017)

a. Fine Motor Activity (Motorik Halus)

It can be interpreted as a skill that requires the ability to coordinate or regulate small/smooth muscles and requires careful coordination. For example, related to efficient, precise and adaptive eye and hand movements. developing fine motor skills or hand-eye coordination skills is an important part of motor development. Examples of fine motor activities include the ability to move objects with your hands, scribble, arrange blocks, cut, write, and so on. (Novianti S, 2020)

b. Rough Motoric (Motorik Kasar)

It can be interpreted as a movement skill or body movement that uses large muscles as the main basis of movement. Gross motor skills include locomotor patterns (movements that can cause movement), such as walking, running, jumping, kicking, going up and down stairs, and others. Apart from that, there are also ball control skills such as throwing, bouncing the ball, kicking, and so on. Insufficient or excessive stimuli, combined with gross motor and fine motor movements that are not well developed, can cause damage to attention to the environment. (Sutapa P, 2022)

c. Movement Learning Method (Metode Belajar Gerak)

Learning Methods has several methods that function to stimulate motor development in early childhood.

1. Playing Method (Metode Bermain)

Active play is important for children to develop muscles and train all parts of their body. Playing also has the function of channeling excess energy to children. If this energy is kept bottled up continuously, it will make children feel tense, anxious and irritable. This playing method can be done anywhere and has no rules as long as the child is happy and can carry it out. and this method has several benefits which will be mentioned as follows.

a. The benefits for motor skills are related to the positive values of toys that occur in the child's body. An example of the relationship is the child's skills, the child's dexterity in doing something and having certain physical abilities.
b. The benefit of affection is that games have benefits related to children's psychological development such as instincts, feelings, emotions, nature, character and character.
c. The cognitive benefit is that toys have the benefit of developing children's intelligence, which includes children's abilities when playing. (Aristanto F, et al., 2017)

This playing method has advantages and disadvantages. The advantage of this playing method is that it can stimulate children's motoric development because playing requires movement, and the disadvantage of this playing method is that it requires money because this method requires tools or media that must be prepared in advance, such as preparing a special room according to the type of game. which will be implemented. (Kusumawati E, et al., 2017)

2. Direct Practice Method (Metode Praktik Langsung)

The Direct Practice Method is a method carried out by an educator or parent by means of direct practice according to the material that will be conveyed to the children. In this method we expect children to gain new experiences through direct interaction with an object. (Munir RF, 2020)

3. **Demonstration Method (Metode Demonstrasi)**

Metode The Demonstration Method is one of the methods used by educators when delivering learning to students to achieve a particular development activity goal. The Demonstration Method has several objectives such as:

a. teaches a process or procedure that students must have.
b. clarify information to students.
c. using the students' auditory and visual observation abilities together.

The demonstration method has advantages such as; 1. make the learning process more interesting, 2. make it easier for students to understand the learning material, 3. make learning clearer and more concrete and avoid verbalism. (Fikawati S, et al. 2018)

4. Field Trip Method (Metode Karya Wisata)

The Work Tour Method is a method that is used as a learning medium for preschool age children. This method is carried out using tools or carrying out activities such as a game, whether done alone or with friends with the aim of making the child feel happy, happy and engrossed while doing it. these activities. and this field trip method carries out learning activities by observing the world according to reality involving the five senses. (Novianti S, 2020)

d. Motor Learning Model (Model Pembelajaran Motorik)

To develop children's motor skills, teachers can use various motor learning models for early childhood, these models are used to achieve children's learning. Considering that each type of education in schools for early childhood has its own characteristics, the motor learning models used depend on the stage of early childhood. This motor learning model was chosen so that the child does not experience injury, the child feels comfortable, is not afraid or anxious when carrying out these movements. (Tarigan H, 2017)

The learning model should have five elements, namely:

- *Syntax* is the operational steps of learning
- *Social system* is the atmosphere and norms that apply in learning
- *Principles* describe how teachers should view, treat, and respond to students,
- *Support system*, namely all facilities, materials, tools or learning environments that support learning
- *Instruction* and *nurturant effects* are learning outcomes obtained directly based on the targeted goals *(instructional effects)* and learning results outside the target *(nurturant effects)*

2. **Meaning of stunted**

Stunted is defined as short or stunted growth. Stunted characteristics are toddlers who have a short birth length (<48 cm) or toddlers who have a low birth weight (<2500 grams). However, being stunted does not necessarily indicate a growth disorder such as stunting. Children who are short in stature but have normal growth and development overall may be considered stunted. (Sutapa P, 2022)

a. Factors That Influence Stuntedness. Namely birth length, apart from infectious diseases, giving additional food that is not appropriate according to age accompanied by the consistency of the food and children who experience low birth weight at birth. Toddlers who have low nutritional status and low birth length will be stunted. Another influencing factor is insufficient nutritional intake to support rapid growth and development in infancy and childhood, as well as frequent exposure to infectious diseases during early life. (Aristanto F, et al., 2017)

b. The Relationship between Stunted and Motor Learning

Stunting that occurs in children can cause delays in physical and mental development, which can increase the risk of illness and even death, as well as disrupt motor and mental development. Therefore, children who have this condition are at risk of decreased intellectual and productivity, as well as increasing the risk of developing degenerative diseases. Therefore, stunting that gets worse will cause motor learning in children to be disrupted. (Kusumawati E, et al., 2017)

DISCUSSION

Nervous System Working in Stunted Children Stunted

The Nervous System in Stunted Children Around 1 in 5 children worldwide suffer from malnutrition or stunting in childhood including increased susceptibility to infection and inflammation. Thanks to improvements in early intervention, most children, even in resource-limited areas, can now survive childhood malnutrition, but still show evidence of neurodevelopmental deficits, including poor school performance and behavioral problems. This condition is exacerbated in children who continue to experience malnutrition during their teenage years. Currently, the negative impacts of malnutrition and infection are a major concern in all circles. Therefore, there is an urgent need to focus on the well-being of this age group and, in particular, on the behavioral, cognitive, and brain disorders of adolescents who experience malnutrition, infections, and inflammation prenatally, in childhood, and during adolescence. . self. Because one third of all pregnant women in the world experience brain and behavioral disorders during this period, it can have intergenerational impacts, thereby affecting the health and well-being of the next generation. (Munir RF, 2020)

In conditions of malnutrition, hormonal changes occur in the body. The concentration of Growth Hormone (GH) in blood plasma increases, while insulin growth hormone (IGF) decreases. An increase in GH in plasma causes GH resistance which then results in a decrease in IGF-1 synthesis. Decreased IGF-1 is the main factor responsible for growth failure in malnourished children. Apart from that, IGF-1 is also associated with the growth and differentiation of body orsgans, and has an important effect in the process of myelination of nerve cells in the brain. Disruption of the myelination process in the brain has an impact on the growth and development of brain cells, namely a decrease in the number of oligodendrocytes and neurons, so that brain capacity cannot be optimal. (Fikawati S, et al. 2018)

Malnutrition also causes cortisol in the blood to increase. This is associated with stressful conditions in the body. Increased cortisol inhibits the action of IGF-1 which is an important factor in growth that has an impact on hepatic gluconeogenesis for glucose production and stimulates lipolysis. This mechanism is considered a strategy for the body's adaptation to conditions of malnutrition. Energy in the body is used for more important processes, namely the function of the nervous system and liver and excludes the formation of lean mass and adipose tissue, so that growth becomes stunted. (Novianti S, 2020)

All functions in the body are controlled by the brain, including the body's motor functions. In conditions of limited brain capacity as a result of malnutrition, motor function will also experience problems. Motor development in general has been programmed genetically and occurs dynamically and continuously along with the direction of brain maturity. As the brain matures, motor skills will increase, namely as old skills disappear and are replaced with new motor skills. On the other hand, the body's motor function goes hand in hand with the child's physical growth and maturity process. Malnutrition inhibits body growth, so that the body's motor function will not develop properly in conditions of malnutrition. A child's motor development depends on the child's physical and intellectual condition. By understanding the relationship between children's intelligence and stunting, it is necessary to take the necessary steps to prevent this from happening. (Tarigan H, 2017)

CONCLUSION AND RECOMENDATION

Motor learning has a big influence on the motor development of children who are stunted and stimulates the growth and development of the child's body. Motor learning has an important role in preventing stunting in children, also has the potential to improve the performance of the central nervous system in children's brains, and improve cognitive function. An effective strategy that can be used to increase children's physical growth, cognitive development, and prevent stunting is by implementing a motor learning program regularly and in a targeted manner. To understand the mechanisms and impact of motor learning on the central nervous system in children, and to identify the motor learning approaches that are most effective in preventing stunting and improving brain performance, further research is needed.

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