



CALCIUM SUPPLEMENTATION DURING PREGNANCY AGAINST DISORDERS OF GROWTH AND DEVELOPMENT OF TODDLERS

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ABSTRACT	Keywords
<p>Golden age is the initial stage of growth and development of toddlers starting covering the first 1000 days of life starting from the womb until toddlers are 2 years old which parents should not miss. This golden period can affect the quality of toddlers in the future, therefore the attention of parents must be maximally devoted to this period. Indonesia is a developing country with a national prevalence of under five nutritional status consisting of 3.9% poor nutrition, 13.8% malnutrition, 79.2% good nutrition and 3.1% excess nutrition. The growth of Indonesian toddlers under 5 years of age who experience deviations was reported by WHO in 2016 with a prevalence of 7,512.6 per 100,000 population (7.51%) (WHO, 2018). The results of the analysis obtained a correlation value of 0.547 indicating that there is an effect of calcium supplementation on the growth and development of toddlers. Good calcium supplementation during pregnancy which starts to be consumed in the 2nd trimester using prophylactic doses is very good for the growth of toddlers, especially those related to bones and teeth, as well as gross motor development.</p>	<p><i>Growth and Development, Toddler, Calcium, Pregnancy</i></p>

INTRODUCTION

The golden age or golden period is the most important period in the growth and development of children covering the first 1000 days of a child's life starting from pregnancy until the child is 2 years old. This phase requires more attention from parents because 80% of a child's brain works at this time, which will affect the formation of children's character, therefore the process of growth and development must receive optimal attention from parents, especially during the golden period. There are several aspects of toddler growth and development including gross motor, fine motor, language and

personal social. Monitoring of child growth and development must be carried out regularly and continuously. This monitoring can be done independently by parents at home, or it can be done with the community and health workers in posyandu activities (Briawan, Galih 2016). This activity (Yulia and Darningsih 2016) is carried out in order to find out the growth and development disorders experienced by children so that they can be overcome as early as possible.

The problem of developmental disorders is not a problem that can be considered easy, referring to the results of research that has been carried out by world

researchers for WHO, it is stated that globally, there are 52.9 million children younger than 5 years, 54% are boys. have developmental disabilities in 2016. About 95% of children with developmental disabilities live in low- and middle-income countries. Nationally, the prevalence of nutritional status of children under five in Indonesia consists of 3.9% malnutrition, 13.8% malnutrition, 79.2% good nutrition, and 3.1% excess nutrition. WHO reported the prevalence of developmental deviations in Indonesian children under 5 years of age in 2016 was 7,512.6 per 100,000 population (7.51%) (WHO 2018). Children who are estimated to experience developmental delays of around 5 to 10%. It is not yet known with certainty the data on the incidence of general developmental delays, but around 1-3% of children under the age of 5 years are estimated to experience general developmental delays (Zulaikha 2021).

To overcome this condition, parents need to prepare for early child growth and development, starting from the moment the mother is declared pregnant. Nutrition consumed by pregnant women greatly affects the growth and development of children under five, therefore the nutrition that must be consumed by pregnant women must meet good nutritional standards, especially high in calories and high in protein.

There are several factors that affect the process of growth and development of a child including genetics, stimulation or environment and optimal nutritional intake. The influence of these factors is very supportive and interrelated in creating an optimal growth and development process (Purnasari, Briawan, and Dwiriani 2016). The process of growth and development really requires good nutrition, one of which is the need for Calcium, because calcium is an important mineral for humans. The largest composition of calcium is found in bones, namely 99 percent, while the remaining 1 percent of calcium is found in

body fluids such as blood serum, in body cells, in extra-cellular and intra-cellular fluids. Calcium has many vital functions in the body, including playing a role in the process of bone and tooth growth, the process of coagulation or blood clotting, the function of the muscles including the heart muscle, metabolism at the cellular level, the respiratory system and so on. Meanwhile, for the development of toddlers, calcium can affect the development of gross motor movements such as the ability to lift the head, lie on the stomach and walk (.

METHOD

This research is a correlation research that aims to determine the influence between the two variables and how far the influence is. In this study, we wanted to know how the effect of calcium supplementation on growth and development disorders of toddlers. This research is a type of cross-sectional research because it is carried out at the same time. The research was conducted at the Jungcancang Polindes from January to December 2022 with 43 toddlers as respondents. The statistical test used in this study is the Contingency Coefficient to determine the effect between the two variables and strengthen the results of data analysis.

RESULTS

Table 1. Respondents' Frequency Distribution Based on Calcium Supplementation in pergnancy.

Calcium Supplementation	Frequency	Presentas e
≥ 90 tablet	28	73,68
< 90 tablet	10	26,32
Total	38	100

Based on the table above, it can be concluded that there are more respondents who regularly

consume calcium during pregnancy ≥ 90 tablets as many as 28 respondents (73.68%)

Table 2. Respondents' Frequency Distribution Based on Toddler Growth and Development.

DDST	Frequency	Presentase
Normal	30	78,95
Delay	8	26,32
Total	38	100

Based on the table above, it can be concluded that more respondents did not experience growth and development delays, namely 30 respondents (78.95%)

The data were then analyzed by obtaining a correlation value of 0.547. This value is then determined by the correlation coefficient interpretation table where it is found that the value of 0.547 indicates the effect of calcium supplementation on the growth and development of toddlers.

DISCUSSION

Growth is identical with the increase in physical size in children, especially the increase in the child's height. The size of the child's head circumference and body circumference must also be monitored because they are also related to the child's development. Growth related to the child's nutritional status and fluid balance in the body can be measured by the child's weight. While development is synonymous with increasing the function of body parts which include gross motor skills, fine motor skills, language, personal social including morals and intelligence in them. (Soedjatmiko 2016).

Many factors affect the growth and development of children such as internal factors and external factors which are interrelated and interact between the two factors. Internal factors are direct factors from within the child's body, such as age, sex, hereditary history, genetic disorders and

chromosomal abnormalities(Adyani 2020). Apart from internal factors, external/environmental factors also have a major influence on the growth and development of children. One example of environmental factors that can affect the growth and development of children include socio-economic, nutrition consumed by children, stimulation provided by parents, psychology, and knowledge possessed by parents(Bingan 2019).

The role of parents includes the two factors above, because genetic influences contribute the most to the formation of the fetus, during pregnancy the mother is a source of nutrition for the fetus. After birth the first stimulation is also given by parents, for that to be good parents need to be prepared as early as possible. Increasing knowledge about the process of forming a fetus and caring for children during the golden period is urgently needed in order to be able to give birth to children with excellent quality both physically and intellectually (Tikar, Dini, and Age 2021).

To get maximum growth and development of children, the World Health Assembly has endorsed the Scaling Up Nutrition program which focuses on addressing nutritional problems in mothers and children (Dahniarti, Idris, and Am 2018). The goal of the Global SUN Movement is to reduce nutritional problems, with a focus on the first 1000 days of life (270 days during pregnancy and 730 days from birth to 2 years of age), namely in pregnant women, breastfeeding mothers and children aged 0-23 months. Indicators of the success of the Global SUN Movement program are reducing the incidence of stunting (short babies), reducing the birth of Low Birth Weight (LBW) babies, and overcoming the condition of children with wasting, underweight and overweight problems (Medicine and Indonesia 2020).

The existence of the Global SUN Movement is expected to have a positive impact on changing the behavior of pregnant

women to be able to consume vitamins and calcium regularly. Adequate calcium intake can form a child's bone mass perfectly. Good bone conditions can make it easier for the limbs to carry out their functions perfectly. (Utami, Cahyaningrum, and Wirawan 2016)

To achieve optimal growth and development conditions, adequate and adequate nutrition is needed. Poor quality and quantity of food can be one of the causes of malnutrition (R Ariyana and Rini 2009). Children with malnutrition conditions can cause growth and development disorders, even the development of children with malnutrition status can result in changes in brain structure and function. Changes in brain structure and function usually occur at the 24th to 42nd week of gestation after fertilization, and then continue until the baby is born until the age of 2 or 3 years, the fastest period in this process takes place at the age of the first 6 months of life or normal called the golden period of life. The growth of brain cells continues until the child is 3 years old (Marfuah 2021). Malnutrition that occurs at the age of under 2 years can cause a reduction in brain cells by 15%-20%, so that children later in life have brain quality of around 80%-85%.

Therefore children should not experience malnutrition during the golden period which is an important period as the beginning of the growth and development of children. If during pregnancy the mother lacks nutrition, it will affect the physical and cognitive development of the child. If a child experiences this disorder at the beginning of its growth, the disorder tends to be permanent. Therefore, pregnant women must consume vitamins, minerals, iron, DHA, and calcium, because these compounds can help increase the growth and development of children from an early age.

Daily nutritional needs for mothers increase during pregnancy, as well as calcium needs. As with other nutrients, the mineral

calcium is not only important for mothers, but also needed by babies during pregnancy. Calcium cannot be produced by the body naturally, so it needs to be obtained through intake, either through food or supplements. (Briawan, Galih 2016) In the human body the highest mineral content is calcium. The composition of human bones is 99% composed of calcium. Calcium has a very important role in various processes of development of physiological functions in the body that can affect the process of blood clotting, calcium is also responsible for maintaining cell membrane potential which works together with sodium and potassium, connecting signals between several hormone receptors, cell membrane integrity, neuromuscular excitability, and the most important thing is the formation of bone structure as well as the body's calcium reserves (Gustirini 2019).

Calcium is indeed synonymous with bone growth in the mother and fetus, but the incidence of hypertension during pregnancy can be prevented with adequate calcium intake. Transfer of calcium from mother to fetus during pregnancy is about 30g (Ulfah, Dimiyati, and Putra 2021). This condition causes calcium absorption and bone turnover to increase to meet the needs of calcium in the fetus. In the third trimester, fetal bones undergo a rapid process of mineralization so that the body experiences a significant increase in calcium needs. The results of the research that has been done show that calcium consumption in pregnant women still does not meet the EAR rate of calcium. It is known that the EAR for calcium for pregnant women in Indonesia is 1167.7 mg/day for ages 16-18 years, 1083.3 mg/day for ages 19-29 years and 1000 mg/day for ages 30-49 years. 19,20 This study showed that the majority of subjects (81.2%) could not meet the needs of calcium which should be obtained from daily food consumption

During pregnancy the mother's need for calcium increases compared to before pregnancy, this is because the fetus has been forming bones and fetuses since in the womb. Pregnant women who experience calcium deficiency can have side effects for both mother and fetus in the form of muscle cramps, tremors, osteopenia, tetanus, low mineralization in the fetus can even cause low birth weight and stunted fetal growth (Villar et al. 2006).

The use of calcium during pregnancy increases twofold compared to non-pregnant women, this condition is caused because the fetus requires large amounts of calcium to support growth and development. As much as 80% of fetal calcium needs are obtained in the third trimester of pregnancy, because the fetus stores a minimum of 28.2 g of calcium. The mother's body undergoes calcium adjustment to compensate for increased calcium secretion to meet the needs of the mother and fetus during pregnancy. The absorption of calcium in the gastrointestinal tract, and the formation of calcium in the bones and excretion of calcium in the feces, urine and sweat are determined by the level of calcium present in the plasma. Parathyroid hormone, vitamin D and calcitonin can also affect the balance of calcium in the body. (Gustirini 2019)

Calcium needs can also be met by consuming milk and its processed products such as yogurt and cheese, legumes are also rich in calcium such as almonds, soybeans and the like, not forgetting green vegetables such as pakcoy and broccoli. These foods contain lots of calcium and are very good for fulfilling nutrition in pregnant women. The increased need for calcium during pregnancy causes mothers to still have to consume supplements that contain calcium. Recommendations given to pregnant women to consume supplements that contain 500 mg of calcium. To meet the needs of calcium as much as 1000 mg, pregnant women can take calcium supplements 2 times a day (Farida 2016).

However, the dosage must still be adjusted according to the doctor's recommendations, because calcium intake should not be excessive. Pregnant women should not consume more than 2500 mg of calcium per day. Too much calcium intake can cause bloating, constipation, kidney stones, heart palpitations, and heart rhythm disturbances, as well as prevent the body from absorbing other important minerals needed during pregnancy, such as zinc and iron. The right dose of calcium for pregnant women is very good for the growth and development of children during the golden period

The formation of bones and teeth that is balanced with good calcium intake, makes bones and teeth stronger and grow normally. Calcium intake is very important for pregnant and lactating women, so they can give birth to children who have healthy teeth and bones.

Adequacy of calcium consumed by the mother is able to build bone strength during infancy of the baby (0-11 months). Child development related to bone strength, among others, at the age of 0-3 months raises the head 45° and moves the head right and left. At the age of 3-6 months turning face down to supine, lifting head 90° and maintaining an upright and stable head position. At the age of 6-9 months the child is able to sit and learn to stand on two legs. At the age of 9-12 months, children can hold objects while standing. (RI. 2010)

Calcium is synonymous with the growth of bone mass, but apart from that calcium is also closely related to the growth of toddler teeth, especially the teeth. Growth abnormalities are closely related to genetic factors and a lack of maternal calcium intake during pregnancy. However, this condition is not a guarantee that mothers who consume enough calcium can give birth to babies with faster teeth growth (Saripudin 2019). The growth of baby teeth begins in the womb, to be precise from the time the fetus is four weeks old until the baby is born. Therefore, a

lack of calcium intake in pregnant women will affect the growth of the baby's teeth after birth. After birth, the condition of calcium deficiency can not be corrected (Atika Putri and Yelda Andespa 2021). Because, the period of formation of milk tooth buds has been completed. Delayed growth of milk teeth related to nutritional problems

CONCLUSIONS

Perception of Nurse Ability in Increasing Hope and Motivation of Patients Hypertension is very important in helping hypertensive patients in hospitals so that this becomes an important component that needs to be considered in helping hypertensive patients.

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