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RESEARCH

Relationship Between Nutritional Status With The Development of Toddlers (Age 1-5 Years) in The Work Area of The Candi Sidoarjo Community Health Center

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ABSTRACT

Infants Are A Very Important Stage In Life And Special Attention Is Needed During This Period. Various Factors Including Lack Of Nutritional Intake, Proper Parenting, Economic Crisis, Lack Of Knowledge, And Lack Of Sanitation And Basic Health Services, Affect The Poor Nutritional Status Of Young Children. Poor Nutritional Status Can Result In Developmental Disorders. This Study Aims To Determine The Relationship Between Nutritional Status And The Growth And Development Of Early Childhood (Ages 1–5 Years).Research Method: This Study Uses A Correlation Study Method Using A Cross-Sectional Approach Involving 45 Toddler Respondents In The Candi Sidoarjo Health Center Working Area Selected Through Purposive Sampling Techniques. Data Collection Was Carried Out Using Anthropometric Measurements And Screening In Assessing The Developmental Conditions Of Toddlers Using KPSP.The Results Of The Study Showed That There Was A Relationship Between Nutritional Status And The Development Of Toddlers In The Candi Sidoarjo Health Center Work Area (P-Value <0.05).. Children Who Receive Adequate Nutrition Will Have Healthy Immune Systems, Optimal Growth And Development, And Improved Learning And Interpersonal Skills.On The Contrary, Children With Nutritional Problems Such As Undernutrition Or Overnutrition Can Experience Various Problems In Their Development. Parents And The Community Must Pay Attention To The Nutritional Status Of Children Under The Age Of Five And Pay Attention To Providing Sufficient And Balanced Nutrition.

Keywords : Development, Nutritional Status, Toddler

INTRODUCTION

The early childhood period is a very influential time and requires serious attention. During this period, significant changes and developments occur, both physically, psychomotorically, mentally, and socially. Children's problems in the process of deviant growth and development due to various factors influencing this, including the child's dietary status and overall health. The availability of adequate nutrition plays a role that influences children's growth and development conditions. Toddlers with poor nutritional status can have an impact that interferes with their cognitive, motoric, and mental abilities, which will ultimately reduce their ability to be active.(Zukrufiana et al., 2020).

Short-term nutritional status can cause side effects such as impaired brain development, impaired intelligence, physical growth and impaired body metabolism. Decreased cognitive ability can have long-term negative consequences. All of this will have a negative impact on the quality of Indonesian human resources, productivity levels, and national competitiveness.(Astarani et al., 2020).

Child development includes everything that makes changes in children in various aspects, such as motor, emotional, cognitive, and psychosocial (interaction with the environment). Motor development is one aspect of the developmental conditions in toddlers, which are divided into 2 types of motor skills, namely gross and fine. Large muscle skills are needed for gross motor skills, such as lying on their stomachs, children can sit, children can crawl, or lift their necks. This movement occurs for the first time at the age of three. Fine motor skills include movements of small muscles, which allow children to draw, break beads, write, or eat. This fine motor development

occurs after the development of the child's gross motor skills(Setiawati et al., 2020).

The World Health Organization (WHO) estimates that around 5-10% of children worldwide experience developmental delays. Around 1-3 percent of toddlers in Indonesia experience general developmental delays, especially motor, language, social, emotional, and cognitive development (Maita & Triana, 2023). The Indonesian Ministry of Health reported that toddlers in Indonesia suffer from developmental disabilities, hearing disorders, low intelligence, and speech delays in 0.4 million (16%). (Anggaraeningsih & Yulianti, 2022).

Besides thatThe incidence of stunting and wasting in the world in 2022, there are 148.1 million children under the age of 5 who are too short for their age (stunting), 45 million children are too thin for their height (wasting). Most children who suffer from malnutrition live in Africa and Asia. In Asia, children under the age of 5 are affected by stunting as much as 52% and the rest live in Africa. As many as 70% are affected by wasting in Asia and more than a quarter live in Africa(WHO, 2023).

In Sidoarjo Regency in 2020, the number of toddlers aged 0–59 months who had been weighed was 66,573 toddlers. There was a prevalence of toddlers suffering from malnutrition (BW/Age) with a percentage of 7.6% and thin toddlers (BW/H) with a percentage of 7.8%.(East Java Provincial Health Office, 2020)In 2021, the number of toddlers aged 0–59 months who had been weighed was 85,957 toddlers. There was a prevalence of toddlers experiencing malnutrition (BW/Age) with a percentage of 0.8%, and thin toddlers (BW/H) with a percentage of 8.2%.(East Java Provincial Health Office, 2021)Results of the Indonesian Nutritional Status Survey (SSGI) in 2022 in Sidoarjo Regency The prevalence of toddlers experiencing stunting and wasting is not small, namely 16.1% of toddlers with stunting, 9.6% of toddlers with wasting (ranking 6th highest in East Java Province)(Health Development Policy Agency, 2022).

In the Candi Health Center work area in 2020, the percentage of toddlers weighed was 30.1%. This percentage has not reached the target of the Sidoarjo Regency Health Office, which is 80%. The number of toddlers experiencing malnutrition (BB/U) in 2020 was 120 toddlers, and the number of thin toddlers (BB/TB) was 147 toddlers.(Sidoarjo Regency Health Office, 2020). In 2021, the number of cases of babies experiencing malnutrition was 406 babies, and the number of cases of thin babies was 385 babies.(Sidoarjo Regency Health Office, 2022). Meanwhile, in 2022, the number of toddlers with malnutrition and undernutrition at Candi Health Center was 358 toddlers.(Sidoarjo Regency Health Office, 2022). Based on the recapitulation data of EPPGBM entry in August of Sidoarjo Regency in 2023 at Candi Health Center, the number of toddlers who have been weighed is 7,130 babies. There are 485 toddlers suffering from Stunting and 454 toddlers experiencing Wasting.

RESEARCH METHODS

The design of this study is descriptive with a correlation study model using a cross-sectional approach with a population of 7,695 toddlers within the scope of the Candi Health Center working area aged between 1 and 5 years. This study used a purposive sampling technique by distributing questionnaires and conducting anthropometric measurements based on the following criteria:

1. Parents who have toddlers (aged 1-5 years) and are willing to participate in the research.
2. Parents of toddlers who come to the integrated health post to weigh and measure their child's height.

The sample size is calculated using the formula. Parents of young children (children aged 1 to 5 years) can apply the formula directly, as follows, for populations below 10,000 or small populations.

Data collected with respondent consent and their identity is kept confidential.

Then the collected data will be analyzed and described in tabular form and narrated.

RESULT

Frequency Distribution of Age Characteristics of Parents of Toddlers

The table shows that almost all categories of parents of toddlers who come to the integrated health post are aged 30-39 years with a percentage of 44%. Parents of toddlers aged 20-29 years are also the second majority who come to the integrated health post with a percentage of 18% at Posyandu Post 1 and 16% at Posyandu Post 2. In addition, parents of toddlers aged 40-49 years and > 50 years are a minority in the data with a percentage of 13% in the 40-49 year category and 9% in the > 50 year category.

Table 1
Distribution Table of Age Characteristics of Toddler Parents in the Candi Health Center Work Area

Research Place	Age of Parents of Toddlers								Total	
	20-29 years		30-39 years		40-49 years		>50 years			
	f	%	f	%	f	%	f	%	f	%
Integrated Health Service Post 1, Balongdowo Hamlet	8	18 %	10	22 %	0	0%	2	4 %	20	44 %
Integrated Health Service Post 2, Tempel Hamlet	7	16 %	10	22 %	6	13 %	2	4 %	25	56 %
Total	15	33 %	20	44 %	6	13 %	4	9 %	45	100 %

Source: Primary Data

2. Frequency Distribution of Characteristics of Toddlers' Last Education of Parents

Table 2

Distribution Table of Characteristics of the Last Education of Parents of Toddlers in the Work Area of Candi Sidoarjo

Research Place	Parents' Last Education								Total	
	SD		JUNIOR HIGH SCHOOL		SENIOR HIGH SCHOOL		S1			
	f	%	f	%	f	%	f	%	f	%
Integrated Health Service Post 1, Balongdowo Hamlet	0	0 %	3	7 %	12	27 %	5	11 %	20	44 %
Integrated Health Service Post 2, Tempel Hamlet	2	4 %	8	18 %	10	22 %	5	11 %	25	56 %
Total	2	4 %	11	24 %	22	49 %	10	22 %	45	100%

Source: Primary Data

From the data obtained from both Posyandu posts, it is known that the number of parents of toddlers with a high school education category is the largest with a percentage of 49%. In Posyandu Post 1 there are no (0%) parents of toddlers with an elementary school education category but in Posyandu Post 2 there are 4%. The data also shows that in Posyandu Post 1, parents of toddlers with a junior high school education category are 7% while in Posyandu Post 2 there are 18%. Data on parents of toddlers with a bachelor's degree in both Posyandu Posts obtained a percentage of 11%. Therefore, the total from both Posyandu Posts of parents of toddlers with a junior high school and bachelor's degree education category is 24% for the junior high school category and 22% for the bachelor's degree category.

Frequency Distribution of Occupational Characteristics of Toddlers' Parents

Table 3
Distribution Table of Occupational Characteristics of Parents of Toddlers in the Work Area of Candi Sidoarjo Health Center

Research Place	Parents' job								Total	
	Housewife		Self-employed		civil servant		Laborer			
	f	%	f	%	f	%	f	%	f	%
Integrated Health Service Post 1, Balongdowo Hamlet	15	33 %	4	9%	1	2%	0	0 %	20	44 %
Integrated Health Service Post 2, Tempel Hamlet	19	42 %	5	11 %	0	0%	1	2 %	25	56 %
Total	34	76 %	9	20 %	1	2%	1	2 %	45	100%

From the data obtained from both posyandu posts, it is known that the number of parents of toddlers who work as housewives is the largest with a percentage of 76%. Parents of toddlers who work as self-employed have a percentage of 20%, this is the second largest data after parents of toddlers who work as housewives. Civil servants and laborers are the least data with both percentages of 1%. The data also shows that parents of toddlers at Posyandu Post 1 who work as housewives have a percentage of 33%, besides parents of toddlers at Posyandu Post 2 are 42%. Parents of toddlers who work as self-employed at Posyandu Post 1 have a percentage of 9% and a percentage of 11% at Posyandu Post 2. Parents of toddlers who work as civil servants at Posyandu Post 1 are 2% but at Posyandu Post 2 there are no (0%) parents of toddlers who work as civil servants. And parents of toddlers who work as laborers at Posyandu Post 2 are 2% but at Posyandu Post 1 there are none (0%) who work as laborers.

Frequency Distribution of Toddler Gender Characteristics

Table 4

Distribution of Toddler Gender on March 14 and 16, 2024 at the Integrated Health Service Post in the Candi Health Center Working Area

Research Place	Gender				Total	
	Man		Woman			
	f	%	f	%	f	%
Integrated Health Service Post 1, Balongdowo Hamlet	11	24 %	9	20 %	20	44%
Integrated Health Service Post 2, Tempel Hamlet	10	22 %	15	33 %	25	56%
Total	21	47 %	24	53 %	45	100%

Source: Primary Data

From the table, it can be seen that the total number of toddlers who were respondents was 45 toddlers. Of the total number of toddlers, female toddlers are the majority in this data, as many as 24 toddlers with a percentage of 53% and male toddlers as many as 21 toddlers with a percentage of 47%. From the table, it can also be seen that male toddlers at Posyandu Post 1 are the majority with a percentage of 24% and female toddlers as many as 20%. While at Posyandu Post 2, female toddlers are more numerous with a percentage of 33% and male toddlers as many as 22%.

Research Place	Parents' Last Education								Total	
	SD		JUNIOR HIGH SCHOOL		SENIOR HIGH SCHOOL		S1			
	f	%	f	%	f	%	f	%	f	%
Integrated Health Service Post 1, Balongdowo Hamlet	0	0 %	3	7 %	12	27%	5	11 %	20	44 %
Integrated Health Service Post 2, Tempel Hamlet	2	4 %	8	18 %	10	22%	5	11 %	25	56 %
Total	2	4 %	11	24 %	22	49%	10	22 %	45	100 %

Frequency Distribution of Nutritional Status

Table 5

Distribution of Toddler Nutritional Status on March 14 and 16, 2024 at the Integrated Health Post in the Candi Health Center Work Area

Research Place	Nutritional Status Category										Total	
	Bad		Not enough		Good		More		Obesity			
	f	%	f	%	f	%	f	%	f	%	f	%

Integrated Health Service Post 1, Balongdowo Hamlet	3	7%	6	13%	11	24%	0	0%	0	0%	20	44%
Integrated Health Service Post 2, Tempel Hamlet	0	0%	6	13%	16	36%	1	2%	2	4%	25	56%
Total	3	7%	12	27%	27	60%	1	2%	2	4%	45	100%

Source: Primary Data

The table shows that almost all toddlers are in the good nutrition group, with a percentage of 24% at Posyandu Post 1 and 36% at Posyandu Post 2. In addition, data on toddlers with the category of malnutrition is a common problem with a percentage of 24%. Posyandu 1 does not have toddlers with the category of overnutrition (0%) and obesity (0%), while at Posyandu 2 there are 2% of toddlers who are overnutrition and 4% who are obese. Posyandu Post 1 has 7% of toddlers who are malnourished, but there are no toddlers with poor nutritional status (0%) at Posyandu Post 2. This also leads to the conclusion that the most serious child nutrition problem at Posyandu 1 and 2 in the Candi Health Center working area is malnutrition with a percentage of 27%.

Frequency Distribution of Toddler Development

Table 6
Distribution of Toddler Development on 14 and 16 April 2024 in the Candi Sidoarjo Health Center Work Area

Research Place	Toddler Development						Total	
	Normal		Doubtful		Deviation			
	f	%	f	%	f	%	f	%
Integrated Health Service Post 1, Balongdowo Hamlet	11	24%	6	20%	3	7%	20	44%
Integrated Health Service Post 2, Tempel Hamlet	19	22%	6	33%	0	0%	25	56%
Total	21	47%	24	53%	3	7%	45	100%

Source: Primary Data

From the table it shows that the category of toddler development is the most in toddlers with doubtful development with a percentage of 20% at Posyandu Post 1 and 33% at Posyandu Post 2. In addition, toddler development data with a normal category also has a large percentage with a percentage of 24% at Posyandu Post 1 and 19% at Posyandu Post 2. At Posyandu Post 2 there was no data on toddler development with a deviation category, while at Posyandu Post 1 there was toddler development with a deviation category with a percentage of 7%. From these results it can be seen that there are problems with toddler development at Posyandu 1 and 2 in the Candi Health Center working area, namely toddler development with a doubtful category with a percentage of 53%.

Bivariate Analysis

Bivariate research examines the relationship between two variables, in this case toddler growth and nutritional status. The following research results are presented in the following table:

Table 7
Relationship between Nutritional Status and Toddler Development in the Candi Health Center Work Area

Nutritional status	Toddler Development						Total	
	Normal		Doubtful		Deviation			
	f	%	f	%	f	%	f	%
Malnutrition and Undernutrition	1	2%	11	24%	3	7%	15	33%
Good Nutrition	27	60%	0	0%	0	0%	27	60%
Overnutrition and Obesity	2	4%	1	2%	0	0%	3	7%
Total	30	67%	12	27%	3	7%	45	100%

Source: Primary Data

A 3 x 3 contingency table was created to assess the relationship between toddler development and nutritional status in the Candi Health Center work area. The test results showed Asymp.sig <0.05, which means that the value still meets the requirements of the chi square test. However, it was found that 6 cells did not meet the chi square test criteria because the expected value

was less than 5. When the contingency table has an expected value of less than 5 more than 20% of the total contents of the row or column merging cells, the overall results of the chi square test do not meet the requirements. Therefore, the contingency table can be simplified to 3x2 as follows:

Table 8
Relationship between Nutritional Status and Toddler Development in the Candi Health Center Work Area

Nutritional status	Toddler Development				Total	
	Normal		Doubt and Deviation			
	f	%	f	%	f	%
Malnutrition and Undernutrition	1	2%	14	31%	15	33%
Good Nutrition	27	60%	0	0%	27	60%
Overnutrition and Obesity	2	4%	1	2%	3	7%
Total	30	67%	15	33%	45	100%

Source: Primary Data

Table 4.8 above is a 3 x 2 contingency table above it is also found that 2 cells do not meet the chi-square test criteria because the expected value is less than 5. When the contingency table has an expected value of less than 5 more than 20% of the total contents of the row or column merging cells, the overall results of the chi square test do not meet the requirements. Therefore, the contingency table is simplified again into a 2x2 contingency table as follows:

Table 9
Relationship between Nutritional Status and Toddler Development in the Candi Health Center Work Area

Nutritional status	Toddler Development				Total	
	Normal		Doubt and Deviation			
	f	%	f	%	f	%
Malnutrition and Undernutrition	1	2%	14	31%	15	33%
Good Nutrition and More	29	64%	1	2%	30	67%
Total	30	67%	15	33%	45	100%

Source: Primary Data

From the results, there are no cells that have an expected value of less than 5 after the table is merged into 2x2, so the chi-square test meets the requirements. So the statistical test in this study is the chi square test with a 2x2 contingency table.

Based on table 4.9, the researcher found that 30 toddlers had better and good nutritional status and normal development. Only 1 toddler with better and good nutritional status had questionable development and deviations. Meanwhile, only 1 toddler with poor nutritional status had normal development, and 14 toddlers with poor nutritional status had questionable development and deviations.

The results of the 2x2 contingency table analysis show an asymptotic significance value of 0.000 less than 0.05. If the significance level is 5% then the p-value is 0.000. This indicates that Ho is rejected and Ha is accepted. This means that there is a relationship between nutritional status and the development of toddlers at the Candi Sidoarjo Health Center.

Discussion

1. Nutritional Status of Toddlers and Toddler Growth in the Candi Sidoarjo Health Center work area

From the results conducted at 2 Posyandu Posts in the work area of Candi Sidoarjo Health Center, namely Posyandu Post 1 Balongdowo Hamlet and Posyandu Post 2 Tempel Hamlet, the number of respondents was 45 people and data on the nutritional status of toddlers was obtained with categories of bad, lacking, good, to obesity. From the results of the study, it can be seen that the growth of toddlers in the work area of Candi Sidoarjo Health Center mostly has a normal category. Based on the results of anthropometric measurements that have been carried out, the number of toddler respondents who have a poor growth category is very small. So the results of the growth of toddlers in the work area of Candi Sidoarjo Health Center are classified as good.

The growth that occurs in toddlers is influenced by nutritional status. Nutritional status is one of the influences on achieving optimal health levels, child growth, body immunity, intelligence, and productivity.(Yunawati et al., 2023).

Malnutrition is one of the nutritional problems faced by toddlers. Lack or imbalance of nutrients needed for growth, thinking activities and everything related to life causes malnutrition.(Jauhari & Ardian, 2024). The results of this study are supported by research from(Catur Utami et al., 2023)who stated in the results of his

research that nutritional status is related to toddler development. This shows that questionable development tends to occur more often in respondents who have below normal nutritional status. The worse a child's nutritional status, the slower the child will experience development.

According to researchers, based on research results and theories that toddlers with developmental deviation categories were found because toddlers experienced malnutrition or undernutrition. Nutritional status is one of the factors that influence toddler development. Based on research results, most toddlers have a normal nutritional category and from these toddlers tend to have normal development in terms of language, gross motor skills, fine motor skills and social skills according to their age. Good nutritional status is obtained from the nutritional intake provided by parents, the more balanced the nutritional intake given, the toddler's growth will follow. The same is true for toddler development, with better toddler growth, toddlers will not experience developmental deviations.

2. Toddler Development in the Candi Sidoarjo Health Center work area

From the results conducted at 2 Posyandu Posts in the work area of Candi Sidoarjo Health Center, namely Posyandu Post 1 Balongdowo Hamlet and Posyandu Post 2 Tempel Hamlet, the number of respondents was 45 people and data on toddler development was obtained with normal, doubtful and deviation categories. From the results of the study, it can be seen that the development of toddlers in the work area of Candi Sidoarjo Health Center mostly has a normal category. Based on the results of interviews and filling out the KPSP that have been carried out, the number of toddler respondents who have development with deviation categories is very small. So the results of the development of toddlers in the work area of Candi Sidoarjo Health Center are classified as good.

According to Pratikiwi (2019), development is a process in which the complexity of body functions—including language, fine and gross motor skills, social skills, and independence—increases. Toddler health and nutrition are among the factors that influence the difficulties of deviant child growth and development. Proper nutrition in children is essential for their growth and development. Toddlers' physical, mental, and cognitive abilities can be severely impaired by inadequate nutritional status.(Zukrufiana et al., 2020). The results of this study are supported by research from(Rahmi, 2023)said that there is a relationship between nutritional status and toddler development. Insufficient nutritional intake in toddlers triggers delays in toddler development.

The complexity of body processes in terms of language, fine and gross motor skills, socializing, and independence increases with development.(Prastiwi, 2019). Physical development, cognitive development, emotional development, language, gross and fine motor skills, personal development, and social development are all included in child growth and development.(Anggaraeningsih & Yulianti, 2022)). KPSP or Pre-Developmental Screening Questionnaire is a child development assessment instrument. In the first type of assessment, questions are asked and answered together with parents, then the answers are written on paper. KPSP only provides two choices: yes or no. At the ages of 3, 6, 9, 12, 15, 18, 21, 24, 30, 36, 42, 48, 60, 66, and 72 months, KPSP is carried out. The closest younger age is used if the child has not reached a certain screening age.(Suryani & Badi'ah, 2018)

According to researchers, based on research findings, toddler development is included in the deviation group because their nutritional status is categorized as poor. One of the things that affects a child's growth and development is their poor nutritional status. Toddlers who do not get enough nutrition consume uneven food. Based on research findings, some toddlers have poor nutritional status. Toddler nutritional adequacy is influenced by several factors. Toddlers can have a sufficient diet if they consume enough protein and calories. Toddlers have better nutritional status when their calorie and protein intake is higher. In addition to malnutrition, research findings show that some toddlers experience excess nutrition or what is commonly called obesity. This may occur due to lack of exercise and consuming more food than the body needs. Being overweight has negative impacts that can trigger a number of diseases.

3. The Relationship between Nutritional Status and Toddler Development in the Candi Sidoarjo Health Center Work Area

Based on research data, there is a relationship between nutritional quality and the growth and development of toddlers. Table 4.9 shows that the number of toddlers with developmental deviations is mostly found in toddlers with poor and insufficient nutritional status. The majority of toddlers in the normal

nutritional category have normal growth and development results.

Nutritional status assessment is assessed based on body mass index for age (BMI/U). Nutritional status is one of the influences on achieving optimal health levels, child growth, body immunity, intelligence, and productivity.(Yunawati et al., 2023). Nutrition plays a special and interconnected role in improving overall health. Minerals, vitamins, and proteins are essential nutrients for metabolic processes. Toddlers use the food they eat as internal energy to complete their activities. Toddler play activities provide valuable learning opportunities. Learning to use toys, understand friendship, interact in the mother tongue, and follow rules.(Catur Utami et al., 2023)Toddlers' health and growth can be negatively impacted if their activities are not balanced with adequate nutrition.

According to researchers from the results of this study, the majority of toddlers with normal nutritional status have normal development because the intake of nutrients that are in accordance with the needs of toddlers causes toddlers to be able to be active and participate in various activities well. Toddlers with poor and over/obese nutritional status tend to experience development that is not in accordance with their age, or their growth and development are problematic and deviant. This is because individuals with poor nutritional status provide insufficient food intake for children, causing children to become weak and inactive, resulting in stunted growth and developmental abnormalities.

CONCLUSION

The conclusion of this study is:

1. Most of the nutritional status in the Candi Sidoarjo Health Center work area is Good or Normal. The category of overnutrition and obesity status is the smallest number.
2. Most of the development of toddlers in the Candi Health Center work area is in the normal category.
3. There is a relationship between nutritional status and the development of toddlers (aged 1-5 years) in the work area of the Candi Sidoarjo Health Center.

SUGGESTION

1. For Health Cadres

For health workers, it is better to improve comprehensive nutritional examinations and provide appropriate solutions if nutritional problems are found. In addition, parents and families of toddlers must also be educated about the need for balanced nutritional intake and healthy eating patterns so that their children can grow and develop optimally. The importance of family eating patterns in determining the nutritional status of toddlers. Health cadres can study the factors that influence family eating patterns and how they impact children's health and development.

2. For Further Researchers

Additional research can be conducted to determine the risk variables that influence the nutritional status of toddlers and their impact on child growth and development. In addition, research may be directed to developing effective nutritional intervention programs to improve the nutritional status of children under five years of age and promote healthy child growth and development.

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