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The relationship between nutritional status and anemia in children aged 36-59 months with developmental problems

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ABSTRACT

The first five years are a very important period for the growth and development of children. Nutritional status and anemia are factors that influence child development. Based on an initial study conducted at PKM Long Ayan, DDTK screening (Early Detection of Growth and Development) in children aged 6 to 72 months as many as 323 children found the highest developmental problems in the age group 36-59 months with a total of 44 children (13.6%). To know the relationship between nutritional status and anemia in children aged 36-59 months with developmental problems in the Long Ayan Sub-Community Health Center Working Area. Quantitative associative with a cross sectional approach. The number of samples was 40 people with total sampling. Bivariate analysis with spearman rank Based on the results of the spearman rank correlation test, the p value is 0.011, where this figure <0.05 which means Ha is accepted and Ho is rejected, so it can be concluded that there is a relationship between nutritional status and child development problems, and for the anemia variable, based on the results of the spearman rank correlation test, the p value is 0.042, where this figure <0.05 which means Ha is accepted, so it can be concluded that there is a relationship between anemia status and child development problems. There is a relationship between nutritional status and anemia with developmental problems in children aged 36-59 months in the Long Ayan Pustu work area.

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INTRODUCTION

In 2019, 5-25% of children suffering from developmental disorders were classified as high health problems in the world. Developmental disorders in Indonesia amounted to 0.4 million (16%) while according to basic health research in 2018, it was reported that the social emotional development of children aged 36-59 months in Indonesia increased to 69.9% but was lower compared to Vietnam at 91.2%. , Kazakhstan 82.1%, and Thailand 79.4% (ARPAN et al., 2022).

The most widely reported data to date shows that around 250 million children are at risk of experiencing suboptimal development (Olusanya et al., 2018). Based on the Early Childhood Development Index. Indonesia's ECDI achievements in 2018 provide a relatively good picture with a score of 88.30. This value is supported by four dimensions, each dimension has a strategic role in forming ECDI. If you pay attention, the two dimensions that produce high dimensional scores are physical ability and learning ability with respective achievements of 97.80 and 95.20. While achievements in the development of numeracy literacy and social emotional abilities are still below 70 percent (64.60 and 69.90 respectively), there are 3 provinces that have ECDI and HDI above the national figure, namely: DKI Jakarta, East Kalimantan and Riau (BPS, 2020).

There are several factors that influence children's development, namely internal factors (age, genetics, gender, genetics), external factors in (maternal nutrition, radiation exposure, drug consumption), birth factors and post-natal factors (nutritional status, chronic diseases namely anemia and heart defects, psychology, stimulation, parenting environment and socio-economics) (Ministry of Health, 2022).

Nutritional status and anemia are factors that influence children's growth and development (Suryani, 2017; Usrati et al., 2023). Children's nutritional status is influenced by the nutrition received by the body, where the function of nutrition is to produce energy, build and maintain tissue, and regulate vital processes (Mastuti et al., 2023). Good nutrition helps physical growth, brain development, work capacity and general health to be at the highest possible level (Natizatun & Nurbaeti, 2018). The developmental maturity experienced by a child will increase his abilities in the field of development, because his current development will influence his development throughout his life (Juliana et al., 2022). Another factor that affects child development is anemia.

Anemia can occur when the body lacks iron, where iron plays an important role in a number of enzymes involved in the synthesis of neurotransmitters including tryptophan hydroxylase which is used to produce serotonin and tyrosine hydroxylase which is used for the synthesis of norepinephrine and dopamine. Neurotransmitter synthesis begins during embryogenesis. Dopamine plays a role in regulating cognition, emotions, movement and hormone release. Striatal tissue with normal levels of dopamine as the main neurotransmitter is associated with higher cognitive abilities and emotional processing, motivated behavior, positive affect, and good motor function (Purnamasari et al., 2020).

What is more important to pay attention to is that children with developmental delays will have difficulty achieving optimal physical and cognitive development, have less than optimal intelligence, are more susceptible to disease, and are at risk of reduced work productivity in the future.(UNICEF, 2021). In children, anemia causes low oxygenation of brain tissue, which in turn causes impaired cognitive, growth and psychomotor functions. growth and psychomotor development (Woldegebriel et al., 2021).

In 2019, the prevalence of stunted toddlers in Indonesia showed a figure of 27.70 percent, or in other words, 28 out of 100 toddlers suffered from stunting. Then, the prevalence of underweight or malnourished children under five will be 17.1% in 2022 or an increase of 0.1 points from the previous year. On the other hand, the prevalence of overweight or obese toddlers will be 3.5% in 2022 or down 0.3 points from the previous year (Amanda, 2023).

Based on the SSGI results of the Ministry of Health in 2022, the stunting rate for East Kalimantan Province is still high, namely 23.9%, wasting at 9%, underweight at 20.4% and overweight at 4% (Hasan et al., 2022). In East Kalimantan based on city/district, Berau Regency, the stunting rate is still high, namely 21.6%. The prevalence of wasted toddlers is 9.4%. The prevalence of underweight toddlers is 18.4%. And the prevalence of overweight toddlers is 4.3% (Ministry of Health, 2022).

Based on research conducted by (Saputo et al., 2020), it shows that there is an influence between nutritional status on child development in Sonorejo Village, Grogol District, Kediri Regency in 2019, where the results of this research are with a p value of 0.002<0.05, so H0 is

rejected. The level of influence is low and positive (r = +0.300), meaning that the more normal the nutritional status, the more normal the child's development will be (Saputo et al., 2020).

Another study conducted by Koshy et al, in 2022 using the cohort study method, the results obtained showed that the highest Fe Deficiency (ID) occurred at the age of 15 months and improved at the age of 24 months. Where the cumulative body Fe status of early childhood at the ages of 7, 15 and 24 months does not show a relationship with child development at the age of 2 years, but is associated with verbal ability, performance and processing speed of cognitive components at the age of 36-59 months (Koshy et al., 2020).

Based on the background above, the researchers intend to conduct an analysis of the relationship between nutritional status and anemia in childrenage 36-59 months with developmental problems. It is important for health workers to increase mothers' knowledge of the importance of nutritional intake for children's development. because adequate nutritional intake will have a good impact on children's health and growth and development. This research highlights the importance of monitoring nutritional status and anemia in children aged 36-59 months to detect risks of suboptimal development. This information can trigger prevention and early intervention efforts to optimize child development and the prevalence of stunting, undernutrition and anaemia in children in Indonesia. It provides insights to policy makers and public health practitioners on the urgency of improving access to child health services and effective nutrition programs.

RESEARCH METHOD

The design of this research is quantitative research with an associative nature with a cross sectional approach. In this research there are independent variables, namely nutritional status and anemia and a dependent variable, namely child development. The research was carried out from December 2023 to January 2024 in the working area of the Long Ayan Community Health Center. The population in this study were all children aged 36-59 months with developmental problems aged 36-59 months in the Long Ayan Community Health Center working area, namely 40 children using a total sampling technique so that samples were taken where all members of the population were sampled. This research analysis was carried out by means of Univariate Analysis and Bivariate Analysis using computer assistance with the SPSS version 27 application.

RESULTS AND DISCUSSIONS

Univariate Analysis

Nutritional Status in Children Aged 36-59 Months With Developmental Problems In the Pustu Long Ayan Working Area

The nutritional status of respondents in this study was categorized into 3 groups, namely nutritional status, poor, poor and good. With a frequency distribution as follows:

Table 1. Description of nutritional status in children aged 36-59 months with developmental problems in the working area of the Long Ayan auxiliary health center

Nutritional status	Number (n)	Percentage (%)
Bad	2	5
Not enough	13	32.5
Normal	25	62.5
Total	40	100

Source: Primary data 2023

Anemia Status in Children Aged 36-59 Months with Problems Developments in the Pustu Long Ayan Working Area

The anemia status of respondents in this study was categorized into three groups, namely no anemia, mild anemia and moderate anemia. With a frequency distribution as follows:

Table 2. Anemia status with developmental problems in the Long Ayan sub-district health center working area

Anemia	Number (n)	Percentage (%)
Not anemic	14	35
Light	18	45
Currently	8	20
Total	40	100

Source: Primary data 2024

Development in Children Aged 36-59 Months with ProblemsDevelopments in the Long Ayan Sub-Puskesmas Working Area

The development of children aged 36-59 months is categorized into three groups, namely mild, moderate and severe anemia. With a frequency distribution as follows:

Table 3. Description of development in children aged 36-59 months with developmental problems in the Pustu Long Ayan Work Area

Development	Number (n)	Percentage (%)
Doubtful	23	57.5
Possible deviation	17	42.5
Total	40	100

Source: Primary data 2023

Bivariate Analysis

Bivariate analysis was carried out to identify the relationship between the independent variables, namely the nutritional status and anemia of the respondents, with the dependent variable, namely child development.

Table 4. Relationship between nutritional status and developmental disorders in children aged 36-59 months in the Pustu Long Ayan work area

Nutritional status	Child development				Total		*p*	*Rs*
	Doubtful		Deviation					
	n	%	n	%	n	%		
Bad	0	0	2	5	2	5		
Not enough	5	13.5	8	20	13	32.5	0.011	-0.400
Normal	18	45	7	17.5	25	62.5		
Total	23	57.5	17	42.5	40	100		

Source: Primary data 2023

Based on Table 4 above, it shows that the highest proportion is in normal nutritional status with questionable development, namely 18 children (45%).

Based on the results of the Spearman rank test, a p value of 0.011 was obtained, where this number is <0.05, which means H1 is accepted and Ho is rejected, so it can be concluded that there is a relationship between nutritional status and recording disorders in children aged 36-59 months in the work area. Long Ayan Sub-district Health Center. The strength of the relationship from the Spearman rank correlation is:-0.400, this means that the relationship between nutritional status and child development problems has a moderate relationship.

Table 5. Relationship between anemia and developmental disorders in children aged 36-59 months in the Pustu Long Ayan work area

Anemia	Child development				Total		*p*	*rs*
	Doubtful		Deviation					
	N	%	n	%	n	%		
No	5	12.5	9	22.5	14	35	0.042	-323

Yes	18	45	8	20	26	75
Total	23	57.5	17	42.5	40	100

Source: Primary data 2024

Based on Table 5 above, it shows that the highest proportion is in children who experience anemia with questionable development, namely 18 children (45%). Based on the results of the Spearman rank test, a p value of 0.042 was obtained, where this number is <0.05, which means H2 is accepted and Ho is rejected, so it can be concluded that there is a relationship between anemia and developmental disorders in children aged 36-59 months in the Puskesmas work area. Long Ayan's maid. The strength of the relationship from the Spearman rank correlation is:-0.323, this means that the relationship between anemia and child development problems is weak.

Discussion

StatusNutritionin children aged 36-59 months with developmental problems in the Long Ayan sub-district health center working area

The results of this study show that the majorityRespondents with normal nutritional status were 25 people (62%). Meeting nutritional needs is one of the things that has an important influence on the growth and development of children under 36-59 months. Consuming nutritious food can determine the level of health achieved or also known as nutritional status. The function of nutrition is to produce energy, build and maintain tissue, and regulate vital processes. Good nutrition helps physical growth, brain development, work capacity and general health to be at the highest possible level. The developmental maturity experienced by a child will increase his abilities in the field of development, because his current development will influence his development throughout his life(Juliana et al., 2022). Early childhood, referring to the first 5 years of life, is the child's fastest and most sensitive period of brain growth and development. This period is easily influenced by poverty and biological and psychosocial risk factors.

Previous research has demonstrated a strong relationship between nutritional status and developmental outcomes in developing countries. Malnutrition hinders rapid brain development by affecting its structural and functional capacities, resulting in developmental deficits among children in all domains. An unhealthy external environment also has a negative impact on children's ability to learn social and developmental skills. Therefore, several social, biological and psychological factorssocial, biological and psychological factors may contribute to children's developmental delays(Saleem et al., 2021).

The results of this research are in line with research conducted by Pratama in 2023 with the research title "The relationship between nutritional status and the development of children aged 1 to 36-59 months" where the research results showed that 13 children (14.4%) had poor nutritional status.), normal nutritional status of 74 children (82.2%), over nutritional status of 3 children (3.3%)(Pratama, Gizi, et al., 2023).

According to researchers' assumptions, nutritional status is very important to support children's growth and development. Where the better the condition of a child's nutritional status, the better the level of development, and vice versa, poor nutritional status of a child can hinder the child's level of development. So the role of parents and health workers is really needed so that children's growth and development can be appropriate to their age.

Anemia Status in Children Aged 36-60 Months with Developmental Problems in the Working Area of Long Ayan Subsidiary Health Center

The results of this study showed that the majority of respondents experienced anemia, namely 26 people (65%). The respondents who experienced mild anemia were 18 people (45%), and the lowest number of respondents with moderate anemia were 8 people (20%). Anemia can have physical, cognitive and emotional impacts.

Where anemia can change brain function during the growth period, thereby affecting learning ability. In childhood it has a long-term impact on neurological development, including the auditory and visual systems. This condition is related to other nutritional status. Malnourished

children, whether underweight or underweight or with stunted growth, tend to experience anemia. In addition, improving anemia status can improve children's cognitive function(Juffrie et al., 2020).

The results of this research are in line with research conducted by Gumilang (2021) with the research title "Overview of risk factors for anemia in toddlers" where the research results show that there are more toddlers who experience anemia than those who do not experience anemia, namely 29 people with a percentage of 52. .7 %(Gumilang et al., 2021).

Research conducted by(Purnamasari et al., 2020)where the results of the study showed that the cumulative body Fe status of early childhood at the ages of 7, 15 and 24 months did not show a relationship with the child's development at the age of 2 years, but was associated with verbal ability, performance and processing speed components
cognition at the age of 36-59 Months.

According to researchers' assumptions, the high incidence of anemia in children aged 36-59 months cannot be separated from various factors, one of which is daily food intake that is deficient in iron. Apart from that, anemia can have physical, cognitive and emotional impacts. Where anemia can change brain function during the growth period. Anemia in children is a problem that must be treated quickly because it will have an impact on various things from the child's physical, cognitive, to emotional aspects. This is because anemia can change brain function during the growth period, thereby affecting learning ability. Screening for anemia in children should be one of the programs at the Community Health Center that can be implemented.

Development of Children Aged 36-59 Months

The results of this research show that based on table 4.5, it is known that the majority of respondents who experienced doubtful development were 23 people (58%). Child development has principles which include, unlimited growth, meaning that naturally children will experience progressive, regular and continuous development, development can be assessed from general responses to specific responses, humans are an interconnected whole, development physical aspects include mental, emotional and social aspects, children have sequential stages of development, development has traits and characteristics, development has patterns, development occurs due to maturity factors and learning factors as well as external factors, development has patterns , development occurs due to maturity factors and learning factors as well as external factors(Pratama, Gizi, et al., 2023).

The results of this research are in line with research conducted by(Kinansi & Wurisastuti, 2020)with the research title "The relationship between parental knowledge and the development of children aged 36-59 months" where the results of the research show that regarding the development of children aged 36-59 months, most of them doubted 18 people (56.3%) and 1 person (3) deviated. .1%).

According to the researchers' assumptions, based on the results of this research, the majority of children experience questionable development, this could be caused by several factors, including nutritional status, anemia, parenting patterns, or the surrounding environment. Children aged 36-59 months also need to receive good developmental stimulation. At pre-school age children have great potential to develop immediately, this potential will develop if they are given services in the form of opportunities to carry out activities that are trained or used according to the child's development. This means that if at that age the child's brain does not receive maximum stimulation, then the child's brain will not develop optimally.

Relationship between nutritional status and child development disorders

The results of this study showed that the highest proportion was those with normal nutritional status with questionable development, namely 18 children (45%). Based on the results of the Spearman rank test, a p value of 0.011 was obtained, where this number is <0.05, which means H1 is accepted and Ho is rejected, so it can be concluded that there is a relationship between nutritional status and recording disorders in children aged 36-59 months in the work area. Long

Ayan Sub-district Health Center. The strength of the relationship from the Spearman rank correlation is -0.400, this means that the relationship between nutritional status and child development problems has a moderate relationship.

Based on the results of this study, it shows a significant prevalence of suspected developmental delays (58%) among children aged three to five years with malnutrition status. Malnutrition in children is one of the main reasons for developmental delays, leading to lifelong adverse impacts on health. Malnutrition affects a child's behavior and temperament. Malnutrition affects children's development, this is because the body cannot develop optimally due to lack of nutrition. The results of this study show that children aged 42 months experienced the most developmental disorders (32.5%) and that malnutrition was most often experienced by children aged 42 months (10%) and 60 months (12.5%).

The impact of malnutrition on children is that children become lethargic and apathetic, malnourished children have problems understanding information and they are less interested in the environment around them compared to well-nourished children. So it can cause developmental problems in social interactions(Saleem et al., 2021).

The early years of life development are fundamental because it is at this stage of human development that the structure of the nervous system grows, matures and becomes better. nervous system structures grow, mature, and become more sensitive to increased environmental exposure. Environmental factors such as nutrition, care, and breastfeeding directly influence predetermined genetic factors in the brain, especially during the early years of life(Wondemagegn & Mulu, 2022).

Several previous studies have explained that malnourished children also suffer from deficiencies in micronutrients, such as calcium and vitamin D, which are important for skeletal muscle function. Malnutrition causes delayed maturation of the auditory pathways and also affects central and peripheral hearing. Nutrition Nutritional deficiencies, even in acute form, disrupt the normal function of the middle ear, with negative consequences for the entire auditory system. Such children have difficulty with spoken and written language(Jimoh et al., 2018). Many studies have shown that children exposed to severe acute malnutrition early in life have poor cognitive function, poor school performance and behavioral problems, stunting and underweight have also been reported to be associated with developmental delays.(De & Chattopadhyay, 2019).

The results of this research are in line with research conducted by(Saputo et al., 2020)where the results of the research show that there is an influence of nutritional status on children's development in Sonorejo Village, Grogol District, Kediri Regency in 2019. The results of this research are in line with research conducted by Bahtiar, et al, 2021 where the results of the study show that in general, the prevalence of suspected developmental delays in toddlers in Terengganu is 31.7%. Prevalence of suspected language, fine-adaptive motor, and personal-social skills delays was 15.0%, 1.7%, and 16.7%, respectively. In children with normal nutritional status, there are several children who are suspected of experiencing delays in language, fine motor skills, adaptive and personal-social skills.

The results of this research also show that there are still 18 people with normal gzi status who are experiencing questionable progress. Where these results are in line with research conducted by(Pratama, Ardian, et al., 2023)where the results of this study show that at least 9 (10%) have normal nutritional status with a doubtful development category, this also shows that good nutritional status is not always in line with the child's development. This shows that nutritional status is not the only doubtful factor, namely 18 children (45%). Based on the results of the Spearman rank test, a p value of 0.042 was obtained, where this number is <0.05, which means H2 is accepted and Ho is rejected, so it can be concluded that there is a relationship between anemia and developmental disorders in children aged 36-59 months in the Puskesmas work area. Long Ayan's maid. The strength of the relationship from the Spearman rank correlation is -0.323, this means that the relationship between anemia and child development problems affects child development.

According to researchers' assumptions, based on the results of this study, Approximately 65% of these children have been identified as questionable development. Where the majority of these children have a normal BMI and height for children their age, although around 30% still experience malnutrition, of which 3 people (8%) experience malnutrition. There are still many children who experience developmental problems, which cannot be separated from the role of parents in raising children both in terms of nutritional intake, stimulation related to child development which is still lacking, and the influence of parents who have more than 3 children so that time is divided for supervision and care. In improving children's daily development, there is still little attention.

The Relationship between Anemia and Child Development Disorders

The results of this study show that the highest proportion is in children who experience anemia with a development of 50 indicating that at least 9 (10%) have a normal nutritional status with a doubtful development category. This also shows that good nutritional status is not always in line with walking straight. with child development. This shows that nutritional status is not the only doubtful factor, namely 18 children (45%). Based on the results of the Spearman rank test, a p value of 0.042 was obtained, where this number is <0.05, which means H2 is accepted and Ho is rejected, so it can be concluded that there is a relationship between anemia and developmental disorders in children aged 36-59 months in the Puskesmas work area. Long Ayan's maid. The strength of the relationship from the Spearman rank correlation is -0.323, this means that the relationship between anemia and child development problems has a weak relationship.

Based on the results of this study, it shows a significant prevalence of suspected developmental delays (65%) among children aged three to five years who experience anemia. Where as many as suffer from mild anemia (45%) and those who suffer from moderate anemia (20%). Anemia is closely related to iron deficiency in the body, where iron plays an important role in a number of enzymes involved in the synthesis of neurotransmitters including tryptophan hydroxylase which is used to produce serotonin and tyrosine hydroxylase which is used for the synthesis of norepinephrine and dopamine. Neurotransmitter synthesis begins during embryogenesis. Dopamine plays a role in regulating cognition, emotions, movement and hormone release. Striatal tissue with normal levels of dopamine as the main neurotransmitter is associated with higher cognitive abilities and emotional processing, motivated behavior, positive affect, and good motor function.(Purnamasari et al., 2020). Apart from forming red blood cells, iron plays a role in the development of nerve cells, namely for neurogenesis, myelination and brain cell differentiation. Children with iron deficiency and anemia were found to have poorer memory, less social interaction, delayed attention, and lower achievement. If iron deficiency occurs during this period, the child will be at risk of experiencing neurobehavioral disorders. Persistent iron deficiency can cause decreased hemoglobin levels or iron deficiency anemia(Ferdi et al., 2022).

Iron nutrition in anemia affects specific mechanisms of the central nervous system which can change children's cognitive, behavioral and psychomotor development. Mild iron deficiency with anemia can affect brain development and intelligence as well as children's psychomotor development. Motor development is not only influenced by anemia or Hb levels, but is also influenced by other factors such as biological factors (nutrition intake), physical environmental factors (sanitation), child characteristics, family factors, and psychosocial factors. Stimulation from the environment is also the most important thing for a child's development. Stimulation is a psychological factor which is an activity to stimulate children's basic abilities so that they can develop optimally. Children who receive targeted and regular stimulation will develop faster than children who receive less stimulation. (Suryana, 2020).

Several studies have shown a relationship between anemia and disorders in children's development. One of them was carried out by(Ferdi et al., 2022)with the research title "Iron status and developmental delay among children aged 24-36 months" where the results of the research were multivariate tests with regression analysis on developmental delays in children with a p value showing a value of 0.022 < 0.05 with an OR value = 6.879 (CI; 1.328 - 35,633). This means that there is

a relationship between anemia in children and delay disorders. With an OR value of 6.879, which means that children who experience anemia are 6.879 times more likely to experience developmental delays compared to children who do not experience anemia. Other research conducted by(Zaky et al., 2021) with the research title "Language disorders in children with iron deficiency anemia" also shows the same results, where the research results show that there are statistically significant differences between the two groups regarding IQ; where 72% of children from the research group had a mentality below average with a p value of 0.0001. There was also a significant positive correlation between IQ and total language scores with serum iron.

According to researchers' assumptions, the relationship between anemia and developmental problems in children aged 36-59 months, can be caused by a lack of iron needed by the body which is not met, which is based on theory, mild iron deficiency which causes anemia can affect brain development and intelligence as well as child psychomotor development. Although in this study there were still children who did not suffer from anemia but still experienced developmental problems, this could be caused by other factors. Where the incidence of anemia and developmental problems in children is not only caused by one single factor but from several factors including biological factors (nutrition intake), physical environmental factors (sanitation), child characteristics, family factors, and psychosocial factors. Stimulation from the environment is also the most important thing for a child's development.

CONCLUSION

The results of the study showed that the majority of respondents had normal nutritional status, indicating that the majority of respondents experienced mild anemia, indicating that the majority of respondents experienced doubtful development. There is a relationship between nutritional status and developmental disorders in children aged 36-59 months in the Working Area of the Long Ayan Sub-Public Health Center and there is a relationship between anemia and developmental disorders in children aged 36-59 months in the Long Ayan Sub-Public Health Center Working Area. This study is only limited to knowing the relationship between the independent variables (nutritional status and anemia) and the dependent variable (developmental disorders in children aged 36-59 months), so that no further analysis is carried out to determine how much the independent variable is related to the dependent variable, so that in this study it cannot know which variable has a greater or closer relationship with the dependent variable. Future research is expected to use regression analysis to determine how much influence the independent variable has on the dependent variable.

References

Amanda, R. Z. T. (2023). *PERAN STAKEHOLDERS DALAM KEBIJAKAN PERCEPATAN PENURUNAN STUNTING DI KABUPATEN BANJARNEGARA 154 PUBLIK 2023*. FAKULTAS ILMU SOSIAL DAN ILMU POLITIK UNIVERSITAS DIPONEGORO.

ARPAN, W. D., PUSPITA, Y., FEBRINA, L., ANDINI, I. F., & KURNIYATI, K. (2022). PENGARUH PERMAINAN PUZZLE TERHADAP PERKEMBANGAN PERSONAL SOSIAL ANAK USIA 3-5 TAHUN PUSKESMAS SIKAP DALAM KABUPATEN EMPAT LAWANG TAHUN 2022. *Journal Of Midwifery*, *10*(2), 27–36.

De, P., & Chattopadhyay, N. (2019). Effects of malnutrition on child development: Evidence from a backward district of India. *Clinical Epidemiology and Global Health*, *7*(3), 439–445.

Ferdi, J., Bardosono, S., & Medise, B. E. (2022). Iron status and developmental delay among children aged 24–36 months. *Paediatrica Indonesiana*, *62*(4), 256–264.

Gumilang, L., Nurlaelasari, D., Dhamayanti, M., Judistiani, R. T. D., Martini, N., & Pramatirta, A. Y. (2021). Gambaran faktor risiko kejadian anemia pada balita. *JKM (Jurnal Kebidanan Malahayati)*, *7*(4), 681–687.

Hasan, A., Kadarusman, H., & Sutopo, A. (2022). Air Minum, Sanitasi, dan Hygiene sebagai Faktor Risiko Stunting di Wilayah Pedesaan. *Jurnal Kesehatan*, *13*(2), 299–307.

Jimoh, A. O., Anyiam, J. O., & Yakubu, A. M. (2018). Relationship between child development and nutritional

status of under-five Nigerian children. *South African Journal of Clinical Nutrition*, *31*(3), 50–54.

Juffrie, M., Helmyati, S., & Hakimi, M. (2020). Nutritional anemia in Indonesia children and adolescents: Diagnostic reliability for appropriate management. *Asia Pacific Journal of Clinical Nutrition*, *29*.

Juliana, E., Nataliningsih, N., & Aisyah, I. (2022). Pemenuhan Kebutuhan Gizi Dan Perkembangan Anak. *Sadeli: Jurnal Pengabdian kepada Masyarakat*, *2*(1), 11–19.

Kinansi, R. R., & Wurisastuti, T. (2020). Perkembangan Anak Usia 36-59 Bulan dengan Status Gizi Normal yang Menderita Malaria di Indonesia Bagian Timur Tahun 2018. *Buletin Penelitian Kesehatan*, *48*(3), 157–168.

Koshy, B., Srinivasan, M., Zachariah, S. M., Karthikeyan, A. S., Roshan, R., Bose, A., Mohan, V. R., John, S., Ramanujam, K., & Muliyil, J. (2020). Body iron and lead status in early childhood and its effects on development and cognition: a longitudinal study from urban Vellore. *Public health nutrition*, *23*(11), 1896–1906.

Mastuti, D. N. R., Pratiwi, Y. S., Chaniago, R., Rosida, R., Sanjaya, Y. A., Yulistiani, R., Astani, A. D., Priharwanti, A., Meri, M., & Swasono, M. A. H. (2023). *PENGANTAR ILMU GIZI: Pemahaman tentang Nutrisi dan Kesehatan*. PT. Sonpedia Publishing Indonesia.

Natizatun, N., & Nurbaeti, T. S. (2018). Hubungan Status Gizi dan Asupan Zat Gizi dengan Kelelahan Kerja Pada Pekerja Industri Di Industri Rumah Tangga Peleburan Alumunium Metal Raya Indramayu Tahun 2018. *Afiasi: Jurnal Kesehatan Masyarakat*, *3*(2), 72–78.

Olusanya, B. O., Davis, A. C., Wertlieb, D., Boo, N.-Y., Nair, M. K. C., Halpern, R., Kuper, H., Breinbauer, C., De Vries, P. J., & Gladstone, M. (2018). Developmental disabilities among children younger than 5 years in 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *The Lancet Global Health*, *6*(10), e1100–e1121.

Pratama, A. A., Ardian, J., Lastyana, W., & Rahmiati, B. F. (2023). Hubungan Status Gizi dengan Perkembangan Anak Usia 1-5 Tahun. *Nutriology: Jurnal Pangan, Gizi, Kesehatan*, *4*(2), 33–38.

Pratama, A. A., Gizi, S., Kesehatan, F., Ardian, J., Lastyana, W., Jauhari, M. T., Fitria, B., & Program, R. (2023). *Hubungan Status Gizi Dengan Perkembangan Anak Usia 1-5 Tahun*. *04*(22).

Purnamasari, D. M., Lubis, L., & Gurnida, D. A. (2020). Pengaruh Zat Besi dan Seng terhadap Perkembangan Balita serta Implementasinya. *Jurnal Sains dan Kesehatan*, *2*(4), 497–504.

Saleem, J., Zakar, R., Bukhari, G. M. J., Fatima, A., & Fischer, F. (2021). Developmental delay and its predictors among children under five years of age with uncomplicated severe acute malnutrition: a cross-sectional study in rural Pakistan. *BMC Public Health*, *21*, 1–10.

Saputo, H., Fazrin, I., & Yalestyarini, E. A. (2020). The Correlation Between Stimulation, Nutritional Status and Child Development. *Jurnal Ners*, *15*(2), 96–100.

Suryani, L. (2017). Faktor Yang Mempengaruhi Status Gizi Balita Di Wilayah Kerja Puskesmas Payung Sekaki. *Jomis (Journal Of Midwifery Science)*, *1*(2), 47–53.

UNICEF. (2021). Southeast Asia regional report on maternal nutrition and complementary feeding. *UNICEF East Asia and the Pacific Regional Office*.

Usrati, S., Santi, T. D., & Amin, F. A. (2023). Analisis Faktor Yang Berhubungan Dengan Perkembangan Motorik Kasar Pada Batita Di Wilayah Kerja Puskesmas Meureudu Kecamatan Meureudu Kabupaten Pidie Jaya. *SAINTEKES: Jurnal Sains, Teknologi Dan Kesehatan*, *2*(1), 1–11.

Woldegebriel, A. G., Gebrehiwot, G. G., Desta, A. A., Ajemu, K. F., Berhe, A. A., Woldearegay, T. W., & Bezabih, N. M. (2021). Identification of Factors Influencing Anemia among Children Aged 6–59 Months in Ethiopia Using Ethiopia Demographic and Health Survey 2016 Data. *Pediatric Health, Medicine and Therapeutics*, 161–175.

Wondemagegn, A. T., & Mulu, A. (2022). Effects of nutritional status on neurodevelopment of children aged under five years in East Gojjam, Northwest Ethiopia, 2021: a community-based study. *International Journal of General Medicine*, 5533–5545.

Zaky, E. A., Abd El Wahab, M., Kamal, S. A., & Khalf, Z. (2021). Language Disorders in Children with Iron Deficiency Anemia. *Egyptian Journal of Ear, Nose, Throat and Allied Sciences*, *22*(22), 1–6.