

IDENTIFICATION OF MATERNAL FACTORS AND NUTRITIONAL STATUS ON THE RISK OF GROWTH AND DEVELOPMENT DISORDERS OF TODDLERS IN THE WORKING AREA OF THE SEKUPANG HEALTH CENTER IN 2026

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ABSTRACT

This study aimed to identify the relationship between maternal knowledge, maternal attitudes, maternal educational level, and toddlers' nutritional status with the risk of growth and developmental disorders among toddlers in the working area of the Sekupang Health Center, Batam City, in 2026. The study employed an analytical observational design with a cross-sectional approach involving 40 mother-toddler pairs selected using an accidental sampling technique. Primary data were collected through structured questionnaires, anthropometric measurements, and child health records. Data were analyzed using univariate analysis to describe respondent characteristics and Chi-square tests to examine the relationships between the independent and dependent variables at a significance level of 0.05. The results showed that most mothers had a moderate level of knowledge (75%), negative attitudes toward child growth and development (60%), elementary or senior high school educational backgrounds (35% each), and most toddlers had normal nutritional status (67.5%). Bivariate analysis indicated that maternal knowledge ($p = 0.012$), maternal attitude ($p = 0.010$), maternal educational level ($p = 0.018$), and toddlers' nutritional status ($p = 0.025$) were significantly associated with the risk of growth and developmental disorders among toddlers. In conclusion, maternal factors and toddlers' nutritional status are important determinants of the risk of growth and developmental disorders, highlighting the need to strengthen maternal health education, improve positive parenting attitudes, and optimize nutritional interventions through primary health care services to support optimal child growth and development.

Keywords: Attitude, Education, Growth And Development Disorders, Maternal Knowledge

INTRODUCTION

In Indonesia, the prevalence of toddlers who experience growth and developmental disorders remains a significant public health concern. Based on the Indonesian Health Profile, the prevalence of severe malnutrition among children under five is 3.9%, while undernutrition reaches 13.8%, and approximately 27.67% of children experience stunting (Ministry of Health of the Republic of Indonesia, 2022). These conditions indicate that nutritional problems continue to contribute substantially to impaired physical growth, cognitive development, and children's overall health status. Growth and developmental disorders during the first five years of life may have long-term consequences, including decreased learning ability, poor academic achievement, reduced productivity in adulthood, and increased susceptibility to chronic diseases. The first one thousand days of life are recognized as the most critical period for child growth and development. During this period, adequate nutrition, appropriate health care, environmental stimulation, and parental involvement are essential to ensure optimal physical, cognitive, language, and psychosocial development. Failure to meet these needs may result in irreversible developmental delays that can persist into adulthood.

Growth refers to quantitative changes in the body, including increases in body size, weight, height, organ dimensions, and the number of body cells. Meanwhile, development refers to qualitative improvements in body functions, motor abilities, language, cognition, emotions, and social adaptation (Nardina et al., 2021). Toddlerhood

is a period of rapid physical and mental development. During this stage, children's brains experience rapid maturation and are highly responsive to environmental stimulation, allowing them to develop abilities such as walking, speaking, thinking, and interacting socially (Atikah, 2019). Therefore, regular monitoring of child growth and development is essential to detect developmental abnormalities as early as possible. Several factors influence children's growth and development, including genetic, environmental, socioeconomic, and maternal factors. Among maternal factors, knowledge, attitudes, educational level, and childcare practices play essential roles in determining children's nutritional intake, health service utilization, stimulation practices, and disease prevention. Mothers with adequate knowledge are generally more capable of recognizing developmental milestones, providing balanced nutrition, and seeking timely medical care when developmental problems are suspected.

Knowledge is the result of human understanding obtained through sensory perception and experience. Most knowledge is acquired through vision and hearing and becomes the basis for individuals to make appropriate health-related decisions (Septiani, 2022). Better maternal knowledge regarding child growth and development encourages appropriate parenting practices, early stimulation, and routine growth monitoring at community health services. Attitude is an individual's response or reaction toward a particular object or stimulus. Although attitudes cannot be observed directly, they influence behavior and determine how mothers respond to recommendations regarding child nutrition, immunization, developmental stimulation, and health service utilization (Hanum, 2020). Positive maternal attitudes are expected to encourage consistent implementation of healthy childcare practices that support optimal child development.

Maternal education also contributes significantly to child health outcomes. According to Langeveld, education is guidance provided by adults to help individuals achieve maturity (Septiani, 2022). Mothers with higher educational attainment generally have better access to health information, greater understanding of child health recommendations, and stronger decision-making abilities regarding nutrition, hygiene, and developmental stimulation. Consequently, maternal education is often associated with improved child growth and developmental outcomes. Another important determinant is the nutritional status of toddlers. Nutritional status reflects the balance between nutrient intake and the body's nutritional requirements. It can be assessed directly through anthropometric measurements, clinical examinations, biochemical assessments, and biophysical examinations, while indirect assessments include food consumption surveys, vital statistics, and ecological evaluations (Soetjningsih, 2020). Adequate nutritional status is fundamental for optimal brain development, immune function, motor skills, and cognitive performance. Conversely, malnutrition may delay physical growth and impair cognitive and psychosocial development.

The World Health Organization (WHO) emphasizes that early identification of developmental disorders and nutritional problems is one of the key strategies to reduce childhood disability and improve long-term health outcomes.

Routine developmental screening, nutritional assessment, and parental education through primary health care services are therefore essential components of child health programs. The Sekupang Health Center, Batam City, is one of the primary health care facilities responsible for monitoring the growth and development of children under five. Despite routine maternal and child health services, developmental

problems are still encountered among toddlers attending the health center. However, information regarding the contribution of maternal knowledge, maternal attitudes, maternal educational level, and children's nutritional status to growth and developmental disorders in this area remains limited. Identifying these associated factors is essential for designing effective health promotion and early intervention programs. Based on this background, the researcher is interested in conducting research to investigate the relationship between maternal knowledge, maternal attitudes, maternal educational level, and toddlers' nutritional status with the risk of growth and developmental disorders among toddlers in the working area of the Sekupang Health Center, Batam.

RESEARCH METHODS

This study employed an analytical observational research design using a cross-sectional approach. A cross-sectional study is an observational research design in which the independent and dependent variables are measured simultaneously at one point in time to determine the relationship between exposure factors and health outcomes without providing any intervention (Setia, 2016; Notoatmodjo, 2018). This design was considered appropriate because the study aimed to identify the association between maternal factors and the nutritional status of toddlers with the risk of growth and developmental disorders in the working area of the Sekupang Health Center. The research was conducted in the working area of the Sekupang Health Center, Batam City, Indonesia, in 2026. The target population consisted of all mothers who had toddlers aged 0–5 years and visited maternal and child health services or integrated health posts (Posyandu) within the study period.

The study sample comprised 40 mother–toddler pairs who met the inclusion criteria. Sampling was performed using a non-probability accidental sampling technique, whereby respondents who happened to visit the health center during the data collection period and fulfilled the eligibility criteria were recruited as research participants (Sugiyono, 2022). The inclusion criteria included mothers who had toddlers aged 0–5 years, were willing to participate by signing informed consent, and were able to communicate effectively during the interview. Mothers who were seriously ill or did not complete the questionnaire were excluded from the study. The independent variables in this study were maternal knowledge, maternal attitude, maternal educational level, and toddlers' nutritional status, while the dependent variable was the risk of growth and developmental disorders among toddlers.

Primary data were collected using a structured questionnaire and anthropometric assessment. Maternal knowledge and attitudes regarding child growth and development were measured using a structured questionnaire developed based on previous literature and child health guidelines. Maternal educational level was categorized into elementary school, junior high school, senior high school, and higher education. Toddlers' nutritional status was assessed using anthropometric measurements, including body weight and age, which were classified according to the World Health Organization (WHO) Child Growth Standards and the Indonesian Ministry of Health anthropometric standards (WHO, 2006; Ministry of Health of the Republic of Indonesia, 2020). Information regarding growth and developmental disorders was obtained from child health records and developmental screening results available at the Sekupang Health Center.

Prior to data collection, the questionnaire was reviewed to ensure content validity and clarity of the questions. Data collection was conducted after obtaining permission from the Sekupang Health Center and informed consent from all respondents. The confidentiality and anonymity of participants were maintained throughout the study in accordance with research ethics principles (World Medical Association, 2013). Data were analyzed using statistical software. Univariate analysis was performed to describe the frequency distribution and percentage of respondents' characteristics, maternal knowledge, maternal attitudes, educational level, nutritional status, and growth and developmental disorders. Bivariate analysis was conducted using the Chi-square test to determine the relationship between maternal knowledge, maternal attitudes, educational level, nutritional status, and the occurrence of growth and developmental disorders among toddlers. Statistical significance was determined at a 95% confidence level ($\alpha = 0.05$). Variables with a p-value < 0.05 were considered to have a statistically significant association with the dependent variable (Dahlan, 2019).

RESULTS AND DISCUSSION

Table 1.

Distribution of Maternal Characteristics in the Working Area of the Sekupang Health Center, Batam City in 2026

Characteristics of Mothers	Frequency (n)	Frequency (%)
Mother Age		
27-29 years	18	45
30-32 years	22	55
Total	40	100
Toddler Age	Frekuensi(n)	Presentase(%)
<1	17	42,5
2	6	15
3	9	22,5
4	4	10
5	4	10
Total	40	100
Education	Frekuensi(n)	Presentase(%)
SD	14	35
SMP	9	22,5
SMA	14	35
PT	3	7,5
Total	40	100
Jobs	Frekuensi(n)	Presentase(%)
IRT	23	57,5
Teacher	2	5
Wiraswasta	14	35
Buruh	1	2,5
Total	40	100
Toodler Age	Frekuensi(n)	Presentase(%)
<1	17	42,5
2	6	15
3	9	22,5
4	4	10
5	4	10
Total	40	100

From the table above, it is explained that the majority of respondents in the age category of 30-32 years are 55% and 27-29 years old as much as 45%. For toddlers less than 1 year old, it is 42.5% and for low percentages in toddlers aged 4-5 years as much as 10% each. For elementary and high school education with the highest percentage of 35%, and low presentation in universities at 7.5%. The highest percentage of mothers' jobs are as IRTs as much as 57.5% and the lowest percentage as laborers as much as 2.5%. The number of toddlers with high presentation at the age of less than 1 year is 42.5% and low presentation at the age of 4-5 years is 10%.

Table 2.

Distribution of Knowledge of Mothers with Growth and Development Disorders of Toddlers in the Working Area of the Sekupang Health Center, Batam City in 2026

Knowledge	Frequency((n)	Percentage (%)
Good	6	15
Medium	30	75
Less	4	10
Total	40	100

From the table, it can be seen that from mothers with good knowledge as many as 6 respondents (15%), mother's knowledge with less than 30 respondents (75%) and mother's knowledge with less knowledge as many as 4 respondents (10%).

Table 3.

Distribution of Mothers with Growth and Development Disorders of Toddlers in the Working Area of the Sekupang Health Center, Batam City in 2026

Attitude	Frequency (n)	Percentage (%)
Negatif	24	60
Positif	16	40
Total	40	100

From table it is known that mothers with a positive attitude are 24 respondents (60%), and mothers with a positive attitude as many as 16 respondents (40%)

Table 4.

Distribution of Nutritional Status of Toddlers with Growth and Development Disorders of Toddlers in the Working Area of the Sekupang Health Center, Batam City in 2026

Nutritional Status	Frequency (n)	Presentase (%)
Normal	27	67,5
Less	11	27,5
Bad	2	5
Total	40	100

From the table, it is known that the distribution of mothers with normal nutritional status of toddlers as many as 27 respondents (67.5%), the nutritional status of toddlers who are lacking as many as 11 respondents (27.5%) and in poor nutritional status of toddlers as many as 2 respondents (5%).

Table 5.

Distribution of Education for Toddlers with Growth and Development Disorders of Toddlers in the Working Area of the Sekupang Health Center, Batam City in 2026

Education	Frequency (n)	Percentage (%)
SD	10	25
SMP	13	32,5
SMA	13	32,5
PT	4	10
Total	40	100

From the table of education levels, 10 respondents (25%), the education level of junior high school mothers as many as 13 respondents (32.5%), the level of high school education as many as 13 respondents (32.5%), and the education level of mothers who graduated from college as many as 4 respondents (10%).

Table 6.

Distribution of Growth and Development Disorders of Toddlers in the Working Area of the Sekupang Health Center, Batam City in 2026

Growth and Development Disorders	Frequency(n)	Percentage (%)
<i>Sindrom Down</i>	36	90
Healthy	4	10
Total	40	100

From table , it is known that 36 respondents (90%) were toddlers with down syndrome and 4 healthy toddlers (10%) Bivariate Analysis

Table 7.

The Relationship of Knowledge with the Growth and Development of Toddlers The Working Area of the Sekupang Health Center, Batam City in 2026

Knowledge	Growing and Developing Toddlers				P-value
	Syndrom Down		Healthy		
	N	%	N	%	
Less	5	13,9	1	25	0,12
Medium	29	80,6	1	25	
Normal	2	5,6	2	50	
Total	36	100	4	100	

The results of the analysis between the relationship between maternal attitudes and the incidence of abnormalities in toddlers with attitudes with negative Down syndrome were 24 respondents (66.7%), and mothers with a potent attitude were 12 respondents (33.3%). Meanwhile, on the attitude of mothers to healthy toddlers, as many as 4 respondents (100%) said positive. The results of statistical tests conducted using Chi Square were found that the p value was 0.010 (p-value 0.05), so it was concluded that the mother's attitude had a relationship with the incidence of abnormalities in toddlers.

Table 8.

The Relationship between Nutritional Status and Growth and Development Disorders of Toddlers in the Working Area of the Sekupang Health Center, Batam City in 2026

Nutritional Status	Toddler Growth and Development				<i>P-value</i>
	<i>Syndrom Down</i>		Healthy		
	N	%	n	%	
Less	24	66,7	0	0	0,025
Medium	11	30,6	4	100	
Normal	1	2,8	0	0	
Total	36	100	4	100	

The results of the analysis between the relationship between the nutritional status of toddlers and the incidence of abnormalities in toddlers with Down syndrome were 24 respondents (66.7%), the nutritional status of 11 respondents (30.6%), and the nutritional status of toddlers who were normal as many as 1 respondent (2.8%). The results of a statistical test conducted using the Pearson Test found that the p value was 0.025 (p-value 0.05), so the nutritional status of toddlers had a relationship with the incidence of abnormalities in toddlers.

Table 9.

The Relationship between Education and Growth and Development Disorders of Toddlers in the Working Area of the Sekupang Health Center, Batam City in 2026

Education	Tumbuh Kembang Balita				P-value
	Syndrom Down		Helathy		
	N	%	n	%	
SD	10	27,8	0	0	0,018
SMP	13	36,1	0	100	
SMA	11	30,6	2	50	
PT	2	5,6	2	50	
Total	36	100	4	100	

The results of the analysis between the relationship between the level of education of mothers and the incidence of disorders in toddlers with Down syndrome and the education level of mothers who graduated from elementary school were 10 respondents (27.8%), the education level of mothers who graduated from junior high school as many as 13 respondents (36.1%), the education level of mothers who graduated from high school as many as 11 respondents (30.6%), and at the education level of mothers who graduated from university as many as 2 respondents (5.6%). Compared to the education level of mothers with healthy toddlers in elementary and junior high schools, the education level of high school mothers was 2 respondents (50%), and at the education level of mothers who graduated from college as many as 2 respondents (50%).

The Relationship between Maternal Knowledge Level and Growth and Development Disorders in Toddlers

The results of the analysis between the relationship between the mother's level of knowledge and the incidence of disorders in toddlers with Down syndrome who had

good knowledge were 5 respondents (13.9%), the moderate level of knowledge was 29 respondents (80.6%), and the level of knowledge was lacking as many as 2 respondents (5.6%). Meanwhile, in mothers with a good level of knowledge in healthy toddlers as many as 1 respondent (25%), medium knowledge level as much as 1 respondent and in low knowledge level as many as 2 respondents (50%). The results of statistical tests conducted using Chi Square were found that the p value was 0.012 (p-value 0.05), so it was concluded that the level of knowledge had a relationship with the incidence of abnormalities in toddlers. This research is also supported by research conducted (Syahailatua & Kartini, 2020) explaining bivariate analysis using the Chi-square test to assess the relationship between knowledge about growth and development, education level, and maternal employment with the development of children aged 1-3 years obtained results of $p=0.045$; $p=0.008$; and $p=0.165$. Based on these results, it was concluded that there was a meaningful relationship between knowledge of growth and development ($p=0.045$) and maternal education ($p=0.008$) and the development of children aged 1-3 years.

The Relationship Between Mothers' Attitudes to Abnormalities in Growth and Development in Toddlers

The results of the analysis between the relationship between maternal attitudes and the incidence of abnormalities in toddlers with attitudes with negative Down syndrome were 24 respondents (66.%), and mothers with a potent attitude were 12 respondents (33.3%). Meanwhile, on the attitude of mothers to healthy toddlers, as many as 4 respondents (100%) said positive. The results of statistical tests conducted using Chi Square were found that the p value was 0.010 (p-value 0.05), so it was concluded that the mother's attitude had a relationship with the incidence of abnormalities in toddlers. This is in line with a study conducted by (Novianti, 2020) which said that as many as 16 people (64%) showed a receptive (positive) attitude while 9 mothers who had a negative attitude (negative) showed a receptive attitude (36%). Based on the attitude table conducted in the study (Puspitasari & Herdyana, 2022), it shows that out of 32 respondents, 18 respondents (56.25%) have a positive attitude, and 14 respondents (43.75%) have a negative attitude.

The Relationship Between Mother's Education Level and Toddler Growth and Development

The results of the analysis between the relationship between the level of education of mothers and the incidence of disorders in toddlers with Down syndrome and the education level of mothers who graduated from elementary school were 10 respondents (27.8%), the education level of mothers who graduated from junior high school as many as 13 respondents (36.1%), the education level of mothers who graduated from high school as many as 11 respondents (30.6%), and at the education level of mothers who graduated from university as many as 2 respondents (5.6%). Compared to the education level of mothers with healthy toddlers in elementary and junior high schools, the education level of high school mothers was 2 respondents (50%), and at the education level of mothers who graduated from college as many as 2 respondents (50%). The results of a statistical test conducted using Chi Square found that the p value was 0.018 (p-value 0.05), so it was concluded that the mother's education level had a relationship with the incidence of disorders in toddlers. This is in accordance with the research conducted by (Oktaviani, 2022) based on bivariate

analysis obtained at the level of mother-communication education (0.013), gross mother-motor education (0.037), and fine mother-motor education (0.041) showing a relationship between maternal education and growth and development in toddlers.

The Relationship between Nutritional Status in Toddlers and Toddler Growth and Development Disorders

The results of the analysis between the relationship between the nutritional status of toddlers and the incidence of disorders in toddlers with Down syndrome were 24 respondents (66.7%), the nutritional status of 11 respondents (30.6%), and the nutritional status of 1 respondent (2.8%). The results of statistical tests conducted using Chi Square found that the p value was 0.025 (p-value 0.05), so the nutritional status of toddlers had a relationship with the incidence of abnormalities in toddlers. This is in line with the research conducted by (Hairunis et al., 2018) the Chi Square value obtained a p value of 0.014. This shows that there is a significant relationship between nutritional status and development in toddlers. Poor nutritional status will affect both mental and social development in children. Therefore, both in healthy children and with children with disorders, it is necessary to pay attention both from the government, the community, and from parents. By finding out the level of motor development of children using a card to be healthy (KMS).

CONCLUSIONS

This study concludes that maternal factors and toddlers' nutritional status are significantly associated with the risk of growth and developmental disorders among toddlers in the working area of the Sekupang Health Center, Batam City, in 2026. Most mothers had a moderate level of knowledge, negative attitudes toward child growth and development, and elementary or secondary educational backgrounds, while most toddlers had normal nutritional status. The bivariate analysis demonstrated that maternal knowledge ($p = 0.012$), maternal attitude ($p = 0.010$), maternal educational level ($p = 0.018$), and toddlers' nutritional status ($p = 0.025$) were significantly associated with the occurrence of growth and developmental disorders. These findings indicate that improving maternal knowledge, fostering positive attitudes toward child care, enhancing maternal educational capacity through health promotion, and maintaining adequate nutritional status are important strategies for supporting optimal child growth and development and reducing the risk of developmental disorders among toddlers.

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