

## Application of Information Motivation Behavior Skill Model on Maternal Parenting Behavior on Child Growth in Sleman, Yogyakarta, Indonesia

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### ABSTRACT

**Background:** Toddler growth disorders in Indonesia reach 59% of the highest ranking in the ASEAN continent, including: physical growth disorders, motor development, language and behavior. Suboptimal child growth can be avoided if mothers are able to support toddler growth by providing the right parenting pattern. Proper parenting can optimize child growth and development. This maternal behavior can be done by applying the Information Motivation Behavior (IMB) skill model. The purpose of this study aims to explore the application of the IMB model-based application to maternal parenting behavior on child growth in Sleman Regency.

**Subjects and Method:** This was a cross-sectional study was conducted at 25 integrated health posts (Posyandu) in Sleman Regency, Yogyakarta, in April-May 2024. A sample of 200 mothers who have toddlers aged 24-60 months was selected using the stratified random sampling. The dependent variable was child growth. The independent variables were information, motivation, skills, and maternal parenting behavior. Data collection was using questionnaires and data analysis was using path analysis with Stata 13.

**Results:** Maternal parenting behavior increased with good behavioral skills (OR = 1.28; 95% CI 0.60 to 1.97;  $p < 0.001$ ), good information (OR = 1.20; 95% CI 0.52 to 1.88;  $p < 0.001$ ), and strong motivation (OR = 0.98; 95% CI = 0.31 to 1.66;  $p = 0.004$ ). Toddler growth is positively influenced by maternal parenting behavior (OR = 1.29; 95% CI = 0.46 to 2.13;  $p = 0.002$ ) and family income (OR = 3.15; 95% CI = 1.92 to 4.38;  $p < 0.001$ ).

**Conclusion:** Maternal parenting behavior increases with good behavioral skills, good information and strong motivation. Toddler growth is positively influenced by maternal parenting behavior and family income.

**Keywords:** information motivation behavior, parenting behavior, toddler growth

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## BACKGROUND

According to the World Health Organization (WHO), the toddler age group is between 0-60 months. The toddler period is an important period in the growth process that determines the success of growth in the future. Growth is an increase in size, number of cells and tissues that can be measured in quantity with units of weight or length (Harjatmo et al., 2017). In general, growth disorders in children that are often found include physical growth disorders, motor development, language and behavior. In 2018, UNICEF found cases of growth disorders in children in the world, a prevalence of 149 million stunted children, 49 million wasted children, and 40 million overweight children. Indonesia is a country in Southeast Asia with the highest prevalence of growth disorders in toddlers at 59% and continued by Timor Leste which is at 57% (UNICEF, 2019).

In Indonesia, it is recorded that there are 18 provinces that have a prevalence of malnutrition above 21.2% - 33.1% (Ministry of Health of the Republic of Indonesia, 2019). Based on the results of the latest basic health research in 2022, it showed that the percentage of stunting incidents was 21.6%, underweight 17.1%, wasting 7.7% and overweight 3.5% (Ministry of Health of the Republic of Indonesia, 2023). Toddler growth problems are also still found in the Special Region of Yogyakarta, toddler growth in the Special Region of Yogyakarta, in 2021 showed that 8.50% of toddlers experienced PEM and 9.83% of toddlers experienced stunting (Yogyakarta health profile, 2021). Based on data from nutritional status monitoring in 2021, from a total of 58,521 toddlers measured, 0.51% toddlers had malnutrition, 7.66% had lack of nutrition, 8.17% were underweight, 3.0% were having overnutrition, 8.38% stunting

toddlers, 3.27% wasting toddlers (Sleman Regency Health Office, 2020).

Suboptimal child growth can be avoided if mothers are able to support monitoring of toddler growth, one of which is by coming to the integrated health post (Posyandu) every month to routinely record the child's weight plus some corrective actions if an abnormal weight is found. This is one of the efforts that have been made in Indonesia to improve child growth and development. According to research conducted by Nazri (2016), Posyandu have an influence on monitoring the growth of toddlers. Therefore, improving the quality of Posyandu services and the provision of quality health workers can encourage the participation of mothers to come to integrated health posts (Nazri et al., 2016). Through integrated health posts, child growth can be monitored by cadres and increase mothers' knowledge in changing parenting behavior given to their toddlers in supporting optimal toddler growth. Proper care or parenting for children can optimize children's growth and development so that children become strong and independent individuals who do not depend on others. Increasing mothers' knowledge and behavior can be done by implementing the Information Motivation Behavior skill model.

The application of the Information Motivation Behavior (IMB) skill model application has proven effective in improving maternal knowledge and behavior in various aspects of health. It is carried out at the integrated health post for screening which helps in improving maternal parenting behavior in the growth of toddlers through socialization with the application of the IMB application. This information is provided and conveyed through various media as a support for education by health

cadres to mothers regarding the importance of monitoring toddlers through screening to help mothers in early detection of problems that occur in the growth of toddlers. Motivation is given by providing information and education about child care and providing social support, so that motivated mothers will be more encouraged to provide optimal stimulation and create a safe and comfortable environment to build child growth. This skill is done based on good information and motivation will be able to practice parenting behavior effectively so that mothers can monitor the growth of toddlers. The model can increase the effectiveness of behavioral change. In recent years, several studies have used the IMB model in interventions on behavioral change and found that it can effectively help to conduct screening in improving maternal parenting behavior on toddler growth.

Therefore, this study aims to explore the application of IMB model-based applications on maternal parenting behavior on the growth of toddlers in Sleman district.

## SUBJECTS AND METHOD

### 1. Study Design

This was a cross-sectional study conducted at 25 integrated health posts (posyandu) in Sleman, Yogyakarta, Indonesia, from April to May 2024.

### 2. Population and Sample

The population of this study were mothers who had toddlers aged 24-60 months. A sample of 200 mothers with their children aged under five from 25 Posyandu in Sleman, Yogyakarta, was selected for this study using simple random sampling. Posyandu was selected using stratified random sampling.

### 3. Study Variables

The dependent variable was child growth. The independent variables were informa-

tion, maternal motivation, behavioral skill, and parenting behavior.

### 4. Operational Definition of Variables

**Toddler growth aged 24-60 months old:** Increase in weight and height in toddlers aged 24-60 months old.

**Maternal Knowledge Information:** Everything that mothers who have toddlers know about the growth of toddlers aged 24-60 months old.

**Maternal motivation:** Maternal encouragement or desire to support the growth of toddlers aged 24-60 months old.

**Behavioral skills:** The mother's ability to carry out behaviors that support the growth of toddlers aged 24-60 months old.

**Maternal parenting behavior:** Mother's actions that arise as an effort to apply information, motivation, and behavioral skills/skills in caring for, educating, guiding and stimulating to support the growth of toddlers aged 24-60 months.

### 5. Study Instruments

The research instrument used for data collection was a questionnaire.

### 6. Data analysis

Univariate analysis was conducted with the aim of determining the frequency distribution and percentage of each variable studied, namely Information Motivation Behavior skill including information, motivation and behavioral skills/skills towards maternal parenting behavior in toddler growth. The next analysis was bivariate which was conducted on each independent variable, namely information, motivation, behavior skill, maternal parenting behavior towards the dependent variable, namely toddler growth and multivariate analysis using the path analysis model.

### 7. Research Ethics

Research ethics including informed consent, anonymity, and confidentiality, were handled carefully throughout the research process. The research ethics permit ap-

proval letter was obtained from the Research Ethics Committee of Dr. Moewardi Hospital, Surakarta, on April 22, 2024 with the number of 977/IV/HREC/-2024.

## RESULTS

### 1. Sample Characteristics

Table 1 shows that of the 200 research subjects studied, there were 92 (46%) female subjects, while there were 108 (54%) male subjects. Subjects of research on the characteristics of maternal age, in the age category <25 years old were 30 (15%) research subjects, and the category of maternal age ≥ 25 years old were 170 (85%) research subjects. On the characteristics of

maternal education, there were 9 (4.5%) research subjects who had the last education of elementary school, 30 (15%) research subjects who had the last education of junior high school, and 99 (49.5%) research subjects had the last education of high school, and 62 (31%) research subjects had the last education of college. Based on the characteristics of maternal employment, in the category of working were 149 (74.5%) research subjects and 51 (25.5%) research subjects who did not work. Lastly, from the characteristics of family income, there were 98 (49%) research subjects with income <Rp. 2,000,000, and 102 (51%) research subjects with income ≥ Rp. 2,000,000.

**Table 1. Sample Characteristics Descriptions**

Variable	Category	Frequency (n)	Percentage (%)
Child's Gender	Female	92	46%
	Male	108	54%
Maternal Age	< 25 years old	30	15%
	≥ 25 years old	170	85%
Maternal Education	Elementary School	9	4.5%
	Junior High School	30	15%
	Senior High School	99	49.5%
	College	62	31%
Maternal Employment	Employed	149	74.5%
	Unemployed	51	25.5%
Family Income	< Rp. 2,000,000	98	49%
	≥ Rp. 2,000,000	102	51%

### 2. Univariate Analysis

Table 2 shows that information on good maternal knowledge was 118 (59%) of the research subjects, and information on poor Maternal knowledge was 82 (41%) of the research subjects. The motivation variable shows that high motivation was 114 (57%) of the research subjects, while low motiva-

tion was 86 (43%) of the research subjects. There were 148 (74%) research subjects with good skills, and 52 (26%) of the research subjects with poor skills. The variable of good parenting behavior was 103 (51.5%) of the research subjects, and poor maternal parenting behavior was 97 (48.5%).

**Table 2. The results of univariate analysis of information, motivation, skills on maternal parenting behavior in the toddlers growth**

Variable	Category	Frequency (n)	Percentage (%)
Information	Poor	82	41%
	Good	118	59%

<b>Motivation</b>	Low	86	43%
	High	114	57%
<b>Skill</b>	Poor	52	26%
	Good	148	74%
<b>Parenting behavior</b>	Poor	97	48.5%
	Good	103	51.5%

### 3. Bivariate Analysis

#### Information on Toddler Growth

Information has a positive effect on toddler growth and the relationship is statistically significant. Every increase in one unit of information will be followed by an increase in toddler growth by 1.24 units (OR= 1.24; 95% CI = 1.05 - 1.47;  $p < 0.001$ ). With a 95% confidence level, every increase in one unit of information will be followed by an increase in toddler growth by 1.05 to 1.47.

#### Motivation on Toddler Growth

There is a positive effect between motivation and toddler growth and the relationship is statistically significant. Every increase in one unit of motivation will be followed by an increase in toddler growth by 1.36 units (OR = 1.36; 95% CI = 1.26 - 1.50;  $p < 0.001$ ). With a 95% confidence level, every increase in one unit of motivation will be followed by an increase in toddler growth by 1.26 to 1.50.

#### Skill on Toddler Growth

There is a positive effect between motivation and toddler growth and the relationship is statistically significant. Every increase in one unit of motivation will be followed by an increase in toddler growth by 1.36 units (OR= 1.36; 95% CI= 1.26 - 1.50;  $p < 0.001$ ). With a 95% confidence level, every increase in one unit of motivation will be followed by an increase in toddler growth by 1.26 to 1.50.

#### Parenting Behavior on Toddler Growth

There is a positive effect between behavioral skills and toddler growth and the relationship is statistically significant. Every increase in one unit of behavioral skills will be followed by an increase in toddler growth by 3.46 units (OR = 3.46; 95% CI = 2.40 - 4.99;  $p < 0.001$ ). With a 95% confidence level, every increase in one unit of behavioral skills will be followed by an increase in toddler growth by 2.40 to 4.99.

**Table 3. The results of the bivariate analysis of information, motivation, skills on maternal parenting behavior on toddlers growth**

Independent Variable	OR	CI 95%		P
		Lower Limit	Upper Limit	
Information	1.24	1.05	1.47	<0.001
Motivation	1.36	1.26	1.50	<0.001
Skill	3.46	2.40	4.99	<0.001
Parenting Behavior	1.16	1.11	1.21	<0.001

### 4. Path Analysis

Table 4 shows the results of the path analysis in this study on the variables of information, motivation, behavioral skills, maternal parenting behavior and toddler growth.

#### The Effect of Maternal Parenting Behavior on Toddler Growth

There is a direct effect of maternal parenting behavior on toddlers growth. Every 1 unit increase in maternal parenting behavior score will be followed by an



increase in toddler growth by 1.29 units (OR= 1.29; CI 95%= 0.46 to 2.13; p= 0.002).

### The Effect of Family Income on Toddler Growth

There is a direct effect of family income on the growth of toddlers. Every 1 unit increase in family income score will be followed by an increase in toddler growth by 3.15 units. (OR= 3.15; CI 95%= 1.92 to 4.38; p <0.001).

### The Effect of Skill on Toddler Growth

There is an indirect effect of behavioral skill on toddlers growth through maternal parenting behavior. This shows that mothers with good behavioral skills are likely to have parenting behaviors towards the growth of toddlers by 1.28 times compared to those with poor behavioral skills. The relationship is also statistically significant (OR = 1.28; 95% CI 0.60 to 1.97; p <0.001).

### The Effect of Information on Skills

The results of the path analysis show that maternal knowledge information has an indirect effect on the growth of toddlers through maternal behavioral skills. This shows that mothers who have good knowledge information are likely to have behavioral skills for the toddlers growth by 1.20 times compared to mothers who have poor knowledge information. The relationship is also statistically significant (OR= 1.20; 95% CI 0.52 to 1.88; p <0.001).

### The Effect of Motivation on Skills

Path analysis of maternal motivation shows that it has an indirect effect on the growth of toddlers through the maternal behavioral skills. This shows that mothers who have high motivation are likely to have behavioral skills for the toddlers growth by 0.98 times compared to mothers who have low motivation. The relationship is also statistically significant (OR = 0.98; 95% CI 0.31 to 1.66; p= 0.004).

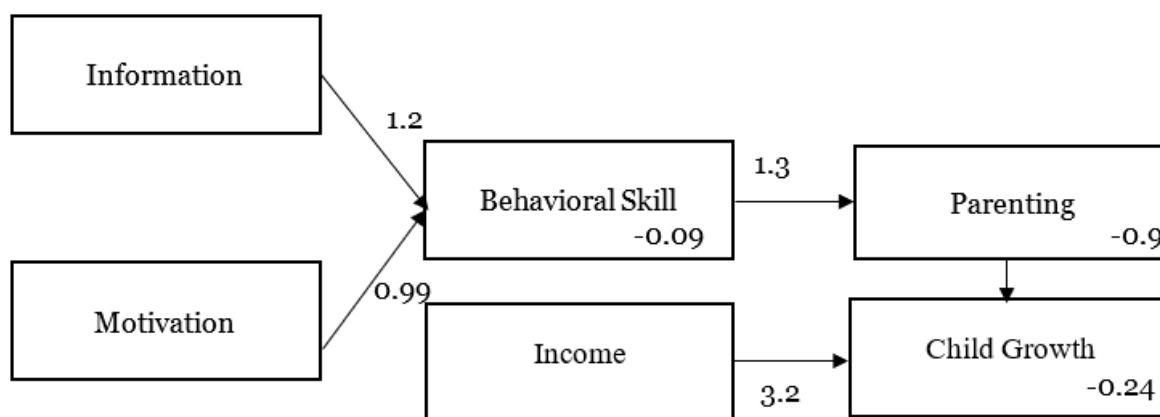


Figure 1. Structural model Path analysis

Table 4. The results of path analysis of information, motivation, skills on maternal parenting behavior in toddler growth

Dependent Variable	Independent Variable	OR	CI 95%		p
			Lower Limit	Upper Limit	
Direct Effect					
Toddler growth	← Maternal parenting behavior	1.29	0.46	2.13	0.002
	← Family income	3.15	1.92	4.38	<0.001

### Indirect Effect

Parenting behavior	← Skill	1.28	0.60	1.97	<0.001
Skill	← Information	1.20	0.52	1.88	<0.001
	← Motivation	0.98	0.31	1.66	0.004

N observation= 200

## DISCUSSION

Based on the analysis in table 4, there is a direct influence of maternal parenting behavior on the toddlers growth. Every 1 unit increase in maternal parenting behavior score will be followed by an increase in toddler growth by 1.29 units (OR= 1.29; 95% CI= 0.46 to 2.13; p= 0.002). This can be interpreted that toddler growth will increase by 1.29 units if there is a 1 unit increase in maternal parenting behavior score.

The results of the study indicate a direct and positive relationship between maternal parenting behavior and the growth of toddlers. Maternal parenting behavior will affect how children grow. Parenting behavior is also influenced by the availability of support in the larger community and provided by institutions, as well as by policies that affect the availability of support services, because attention and moral values, parenting patterns will help to guide children in a positive direction as they grow older (Suwarni and Hernawan, 2019).

A study by Augustine (2015) reported that parenting patterns have an important role in the development and growth of early childhood. Different parenting styles provide different benefits for child development. Interactions between parents and children such as providing stimulation can produce positive social development for children because responsive parents will build good social development in children. Children tend to increase their involvement with the environment when mothers learn to adapt to their children's needs (Augustine et al., 2015).

The support provided by parents is applied in the form of parenting patterns that refer to the ability of parents to be aware of and responsive to their children's circumstances, needs, and goals. Supportive parents can create an emotionally safe environment, where children are encouraged to express their needs and health complaints (Qi et al., 2017). The principles of positive parenting patterns are realized by providing a sense of security, fulfilling nutrition, developing a balanced life, establishing positive communication, and strong attachment to children (Hyoscyamina and Dewi, 2012).

There is a direct influence of family income on the growth of toddlers. Every 1 unit increase in family income score will be followed by an increase in toddler growth of 3.15 units (OR= 3.15; 95% CI= 1.92 to 4.38; p <0.001). This can be interpreted that toddler growth will increase by 3.15 units if there is a 1 unit increase in family income score.

This study shows that there is a direct influence of family income on the growth of toddlers. The results of this study are in line with research conducted by Handini (2013) and Haryanti (2016) which showed a relationship between family income and children's nutritional status (Handini et al, 2013; Haryanti et al., 2016). Families with low economic status cause low family food consumption, which will result in a minimum nutritional status consumed, especially in toddlers. The level of family income can also influence parents in providing facilities and infrastructure to support growth and motor development in children

for the process of stimulating child growth and development (Firdaus, 2016). However, better family income does not always improve child growth and development. This is caused by daily purchases, if they do not match the nutrition needed by the child, it will cause an inappropriate child's growth and development for their age (Tomlinson et al., 2015).

The results of the study indicate that behavioral skills on the growth of toddlers have an indirect effect through the mother's parenting behavior. Mothers with good behavioral skills are more likely to have parenting behaviors on the growth of toddlers (OR = 1.28; 95% CI 0.60 to 1.97;  $p < 0.001$ ).

Behavioral skills refer to a mother's ability to translate information and motivation into action in the toddler's parenting pattern. This includes skills such as effective communication with the child, building strong relationships, handling difficult situations patiently, understanding the child's needs, and practicing safe and healthy care to support the growth of the toddler. Behavioral skills in child development are additional and fundamental factors that determine whether individuals who have good information and motivation will be able to practice parenting behaviors effectively. Behavioral skills involve the objective ability and subjective self-efficacy of the individual to practice the actions necessary to perform, maintain, and implement parenting behaviors (Wijayanto et al., 2022). Behavioral skills of parenting patterns to their children are done by modeling positive behaviors such as empathy, comfort, and mothers also encourage in choosing healthy foods and cognitive stimulation in their children by exposing them to new experiences that foster curiosity and learning to support

optimal growth of toddlers (Cuervo et al., 2020).

There is an indirect effect of information on the growth of toddlers through behavioral skills. Mothers who have good knowledge information are likely to have behavioral skills for the growth of toddlers (OR= 1.20; 95% CI 0.52 to 1.88;  $p < 0.001$ ).

Specific knowledge about health and safety including knowledge about how to access health services, protect children from physical harm and promote good hygiene and nutrition are core competencies in parenting. Experimental studies have shown a positive relationship between parental knowledge about nutrition and children's nutritious food intake and reduced calorie and sodium intake. Campbell (2013) found that children whose parents received information on knowledge, skills and social support related to infant feeding, diet, physical activity than children whose parents were in the control group (Campbell et al., 2013). The other factor related to children's nutritious food intake is parental role modeling of good eating habits and nutritional practices to support optimal child growth (Mazarello et al., 2015).

There is a direct effect of maternal motivation on behavioral skills to support the growth of toddlers and it is significant. Other studies also show that maternal motivation plays a role in providing positive affirmations, conveying love and respect, and creating a sense of security. Providing motivation by mothers helps minimize the risk of internalizing behavior, such as behaviors related to anxiety and depression, which can interfere with children's adjustment and ability to function well at home, at school, and in the community. Strong high motivation can encourage mothers to be actively involved in predicting behavioral skills to support optimal toddler growth



(Torquato et al., 2019). High motivation can increase optimal toddler growth (Meunier et al., 2016). This is in line with the results of this study which states that behavioral skills will increase along with increased maternal motivation.

#### **AUTHOR CONTRIBUTION**

All authors have made significant contributions to the data analysis and preparation of the final manuscript

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This study is self-funded.

#### **CONFLICT OF INTEREST**

There was no conflict of interest in this study.

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