

The Relationship Between Maternal Stress Level and the Development of Children Aged 24-59 Months in Palembang City

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Abstract

The toddler period is a golden period where at the age of 0-5 years the growth and development of the toddler's brain increases rapidly. So every family needs to understand this golden age period so that children's growth and development can be achieved optimally. As individuals who are close to children, mothers have an important role in providing stimulation to children during their development. The study aims to examine the relationship between maternal stress levels and the development of children aged 24-59 months in Palembang City. The study is a quantitative analytic study with a cross-sectional approach. This study uses the design of a random sampling cluster with the number of samples of 128 respondents. There are 8 respondents (80%) of mothers with high levels of stress having children with inappropriate development. Stress levels are associated with child development (p -value=0.047; 95% CI=1.232-2.575) and the confounding variable associated with child development are maternal support system (p -value= ≤ 0.001 ; 95% CI=1.499-3.382). Mothers with high stress levels had a risk of having children with inappropriate development 2.182 times greater than mothers with low stress levels after controlling for the variable of support system (95% CI = 0.418 - 11.389).

Keywords: Stress level; Maternal; Child development; Aged 24-59 month

Introduction

The toddler period is a golden age where at the age of 0-5 years the growth and development of the toddler's brain increases rapidly. It is during this time that stimulation, parenting and nutritional patterns will continue to be adopted by children until adulthood. So that every family needs to understand this golden age period so that children's growth and development can be achieved optimally. The toddler period is also called the "critical period" where if during this period the toddler is not properly nurtured, the child will experience emotional, social, mental, intellectual and moral developmental disorders which can later affect his attitude and behavior in adulthood (Rumahorbo, 2020). This period is also a critical period in a child's life, because at ± 100 billion brain cells at this time are ready to be stimulated so that a child's intelligence can develop optimally in the future (Sugeng et al., 2019).

Development is the increase in ability in the structure and function of the body that is more complete, has a regular and predictable pattern as a result of the maturation process. It involves the process of differentiation of body cells, body tissues, organs and organ systems that develop in such a way that each can fulfill its function (Soetjiningsih & Gde

Ranuh, 2013). Child development is part of the transformative agenda until 2030, making it an international priority. Sustainable development goal 4 states that all children should have the opportunity to reach their full developmental potential (Raikes et al., 2017).

According to the RISKESDAS report of 2018, appropriate child development in Indonesia was 88.3% with numeracy literacy development at 64.6%, physical abilities at 97.8%, social emotional abilities at 69.9%, and learning abilities at 95.2%. This means that there are still 11.7% of children experiencing inappropriate development (Kementrian Kesehatan RI, 2018). The high number of children with inappropriate development needs to be a concern so that developmental problems in children can be overcome.

The successful development of a child during the golden age is influenced by two main factors, namely genetics (for example, ethnicity or certain congenital diseases) and the environment in which the child lives (family) (Syahailatua & Kartini, 2020). As the closest environment for children, families play an important role in child development. In the family, the mother is the closest individual to the child so that the mother's parenting style greatly influences the growth and development of the child (Rosyada et al., 2022). The

mother figure is the first and main teacher who is responsible for the first 1000 days of life (1000 HPK) in children. In parenting, support from the closest people is needed so that mothers can take care of their children well. In fact, many mothers, both housewives and working mothers are vulnerable to mental health (Kementerian PPPA, 2023).

Stress is one of the psychological responses that occurs in a person when facing things that he feels difficult to deal with (Smeltzer & Bare, 2008). Stress can affect a person's feelings, thoughts and even behavior in living everyday life. Stress experienced by a mother can cause discomfort in carrying out her daily activities (K. A. K. Putri & Sudhana, 2013). Stress during the parenting period such as parenting stress, low social support, experiencing conflict, can result in maternal depression which has an impact on behavioral development problems in toddlers.

Stress or social emotional disorders experienced by mothers are obstacles in the mother's efforts to provide the best parenting and stimulation for children so that stressed mothers can affect the developmental process in children. Based on the description above, this study aims to determine the relationship between the level of maternal stress and child development aged 24-59 months in Palembang City. This study has received a certificate of ethical feasibility with Number: 245/UN9.FKM/TU.KKE/2023 on May 30, 2023 from the Health Research Ethics Commission of the Faculty of Public Health, Sriwijaya University.

Methods

This study is a quantitative study using cross-sectional approach. This study used cluster random sampling design located in Palembang City, namely in Sukarami Sub-district, Ilir Barat 1 Sub-district, Kemuning Sub-district and Alang-alang Lebar Sub-district of Palembang City. These four Sub-district were randomly selected from 18 districts or 20% of the total cluster.

The population in this study were families with children under five years of age 24-59 months and residing in Sukarami Sub-district, Ilir Barat 1 Sub-district, Kemuning Sub-district and Alang-alang Lebar Sub-district of Palembang City. The sample in this study were families who had children under five years of age 24-59 months, domiciled in Sukarami Sub-district, Ilir Barat 1 Sub-district, Kemuning Sub-district and Alang-alang Lebar Sub-district of Palembang City and met the criteria of being willing to become research respondents.

The sample size to be used in this study uses a sample size formula with a difference of 2 proportions. Based on the results of the calculation of the minimum

sample for this study 58 toddlers but because the design uses a cluster it must be multiplied again deff value of 2 so that the total minimum required toddlers of 116 toddlers plus 10% to accommodate incomplete data so that the minimum sample amounted to 128 toddlers aged 24-59 months.

The dependent variable in this study is the development of children aged 24-59 months. The independent variable in this study is the mother's stress level. While the confounding variables are mother's age, mother's education, mother's job, family income and mother's support system. Identification of child development using the KPSP (Developmental Pre-Screening Questionnaire) form while identification of maternal stress levels using the Depression Anxiety Stress Scales (DASS 42).

Analysis was conducted using univariate, bivariate, and multivariate analysis. Univariate analysis aimed to provide an overview of respondent characteristics, child development and maternal stress levels. The bivariate analysis used was the chi-square test to see the relationship between two categorical variables. Multivariate analysis was performed using multiple logistic regression test with risk factor model. Where the PR change of the main variable will be seen.

Result

Table 1. Characteristics of Respondents

Variable	f	%
Child Development		
Inappropriate	61	47.7
Appropriate	67	52.3
Maternal Stress Level		
High	10	7.8
Low	118	92.2
Maternal Age		
≤ 35 years old	88	68.8
>35 years old	40	31.3
Maternal Education		
Low	24	18.8
High	104	81.3
Maternal work		
Working	49	38.3
Not Working	79	61.7
Family Income		
Low	59	46.1
High	69	53.9
Support System		
Low	61	47.7
High	67	52.3



Source : *Primary Data*, 2023

Based on table 1, out of 128 respondents observed, 47.7% of children experienced inappropriate development and 52.3% experienced appropriate development. Meanwhile, 7.8% of mothers had high stress levels and 92.2% of mothers had low stress levels. The proportion of mothers aged ≤35 years was 68.8%, and aged >35 years was 31.3%. The proportion

of mothers with low education was 18.8% and 81.3% with high education. The proportion of working mothers was 38.3% and non-working mothers was 61.7%. The proportion of families with low income was 46.1% and 53.9% of families with high income. The proportion of low maternal support system was 47.7% and 52.3% of high maternal support system.

Table 2. Relationship between Maternal Stress Level and Confounding Variables with Child Development

Variable	Child Development				Total		p-value	PR (95% CI)
	Inappropriate		Appropriate		f	%		
	f	%	f	%				
Maternal Stress Level								
High	8	80	2	20	10	100	0.047	1.781 (1.232-2.575)
Low	53	44.9	65	55.1	118	100		
Maternal Age								
≤ 35 years old	45	51.1	43	48.9	88	100	0.328	1.278 (0.831-1.967)
>35 years old	16	40	24	60	40	100		
Maternal Education								
Low	15	62.5	9	37.5	24	100	0.165	1.413 (0.969-2.061)
High	46	44.2	58	55.8	104	100		
Maternal work								
Working	23	46.9	26	53.1	49	100	1.00	0.976 (0.670-1.421)
Not Working	38	48.1	41	51.9	79	100		
Family Income								
Low	31	52.5	28	47.5	59	100	0.398	1.208 (0.841-1.736)
High	30	43.5	39	56.5	69	100		
Support System								
Low	41	67.2	20	32.8	61	100	<0.001	2.252 (1.499-3.382)
High	20	29.9	47	70.1	67	100		

Source : *Primary Data*, 2023

Based on table 2 on the main variable, 80% of mothers with high stress levels have children with inappropriate development, while mothers with low stress levels have children with appropriate development of 55.1%. The results of statistical tests using the chi-square test obtained a p-value <0.05 which is 0.047 which means that the level of stress in mothers is associated with the development of children aged 24-59 months in Palembang City.

Based on table 2 on confounding variables, it can be seen that the support system has a relationship with child development with a p-value <0.05, namely <0.001. While other confounding variables such as mother's age, mother's education, mother's occupation and family income have no relationship with child development, it can be seen in the p-value obtained >0.05.

Table 3. Full Multivariate Model of the Relationship between Maternal Stress Level and Child Development at 24-59 Months of Age in Palembang City

Variable	p-value	PR
Maternal Stress Level	0.426	2.020
Maternal Age	0.167	1.834
Maternal Education	0.7	1.249
Maternal work	0.95	1.027
Family Income	0.71	0.845
Support System	<0.001	4.490

Source : *Primary Data*, 2023

Based on table 3, it is obtained that the level of maternal stress is the main variable, and other confounding variables are potential cofounders. Furthermore, the variables will be eliminated one by one starting from the largest p-value and then calculated the change in PR full model and reduced



model whether >10% or not. If >10%, then the variable is re-entered into the final model because it is a confounder.

In multivariate analysis, confounding test analysis was conducted on confounding variables. The results of the analysis obtained 4 variables whose PR changes <10%, namely the variables of maternal age, maternal education, maternal work and family income. This means that these variables are not confounding variables. So that the final model is obtained as follows.

Table 4. Final Multivariate Model of the Relationship between Maternal Stress Level and Child Development at 24-59 Months of Age in Palembang City

Variable	p-value	PR	95% CI
Maternal Stress Level	0.355	2.182	0.418-11.389
Support System	<0.001	4.308	1.981-9.370

Source : *Primary Data, 2023*

Based on table 4 in the final multivariate model, the PR value is 2.182, which means that mothers with high stress levels are 2.182 times more likely to have children with inappropriate development compared to mothers who have low stress levels after controlling for the variables of support system (95% CI = 0.418 – 11.389).

Discussion

Based on the results of the analysis, the prevalence rate of children who experienced inappropriate development was 47.7%, which means that almost half of the children who were respondents experienced inappropriate development. This is in line with research conducted by (Y. R. Putri et al., 2018) which obtained a prevalence of 53.4% in children with abnormal development. While the prevalence of mothers with abnormal stress levels in this study was obtained at 10.9%. This finding is different from the results of research conducted by (Simatupang & Ricky, 2021) which obtained a prevalence of mothers with mild and severe stress levels of 65.3%.

In parenting, the role of parents is very large in supporting children's growth and development. As the individual closest to the child, the mother plays an important role in providing stimulation to the child so that the child's development can take place optimally (Syahailatua & Kartini, 2020). Optimizing child development can be fulfilled in the parenting needs provided. The parenting needs that can be given to children are by giving attention, rules, discipline, punishment and responding to their children's wishes (Ilmiah et al., 2019). Apart from parenting, mothers have a complex role in the family. This puts

responsibility and pressure on the mother so that it is vulnerable for a mother to experience stress. Stress felt by parents, especially those related to parenting, can be said to be parenting stress. According to Deater-Deckard, parenting stress is a negative stress condition experienced by someone due to the demands of parenthood (Andriani et al., 2019).

This study shows that mothers with high levels of stress can affect child development after controlling for variables of support system. The results of multivariate analysis showed that mothers with high levels of stress were 2.182 times more likely to have children with inappropriate development than mothers with low levels of stress (PR = 2.182). According to (Harris & Santos Jr, 2020) in his research shows that mothers who experience emotional problems such as depression have an influence on child development. In a study conducted by (Lafortune et al., 2021) showed that psychological stress has a significant effect on child development (cognitive, motor, physical, socio-emotional, and behavior).

Based on research (Cohen & Limbers, 2019) which states that poor maternal mental health is related to parenting and care given to children. This is in line with research (Syahputra et al., 2022) which states that there is a relationship between maternal stress and parenting with a risk level of 3.5 times. Stress experienced by mothers is an obstacle in the mother's efforts to apply parenting and provide the best stimulation for children (Rosyada et al., 2022). When mothers experience stress, they tend to apply poor parenting to children so that the stimulation provided is less than optimal. Less than optimal stimulation can affect child development. Conversely, mothers who do not experience stress will be optimal in applying good parenting so that child development can run optimally. The impact of maternal stress on child development, it is necessary for a mother and people in the mother's closest environment to understand how to deal with stress and factors that can trigger stress in mothers during the parenting period.

In this study, there were 1 variable that controlled the relationship between maternal stress level and child development aged 24-59 months in Palembang City, namely support system. The variable become confounding variables that affect the level of maternal stress on child development. According to research (Warella et al., 2021) supports that there is a significant relationship between the support system and each category of DAS (depression, anxiety, stress) which has a negative correlation which means that if the support system is high, the level of DAS will be low, and vice versa. According to (Fábián et al., 2017) the positive impact of individuals who receive support systems from others appropriately, which can be a coping stress when individuals have problems and can



provide well-being in individuals. The support system has the benefit of reducing anxiety, depression and symptoms of bodily disorders for people experiencing stress.

Conclusion

Statistical results showed that the level of maternal stress was associated with the development of children aged 24-59 months in Palembang city where there were 8 respondents (80%) of mothers with high levels of stress had children with inappropriate development. Based on the results of multivariate analysis, it was obtained that mothers with high levels of stress are at 2.182 times the risk of having children with inappropriate development after controlling for the variables of support system.

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Author Contribution and Competing Interest

Contributing authors for this research are interested in collecting and analyzing data and compiling the manuscript.

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