# Child Survival Strategies on the Growth and Development of Infants Aged 0-6 Months in Makassar City (A Study on Employed and Unemployed Mothers)

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#### **ABSTRACT**

The South Sulawesi Provincial Government, through the health Office, stated that South Sulawesi currently has a fairly high infant mortality rate. From January to September 2018, a total of 870 infants died. According to these data, the highest mortality rate was recorded in Bone District. High maternal and neonatal mortality rates have a major impact on families and communities. Therefore, it is highly expected that women's participation as housewives will directly determine the survival of their infants.

This study aims to determine the effect of child survival strategies (CSS) on the growth and development of infants of employed and unemployed mothers aged 0-6 months. It is an observational study with a case-control design. This study involved employed and unemployed mothers who had infants aged 0-6 months. The sample was determined by the simple random sampling method in the case and control groups. The Data was collected through interviews using a questionnaire and then analyzed statistically. This study is expected to provide input for the Indonesian Government (Health Office) as a consideration in formulating policies to reduce infant mortality rates, especially in South Sulawesi.

The results indicated a significant correlation between mothers' occupations and their infants' fine motor skill development category (p < 0.05 or = 0.033). The anthropometry of infants of employed and unemployed mothers indicated no significant differences, both in terms of age, body weight, and body length (with p > 0.05).

There was a significant correlation between mothers' occupations and their infants' fine motor skill development category. The infants of employed mothers tend to have good fine motor skill development than those of unemployed mothers. The percentage of growth and development of other infants that fall into the good category was found to be higher in employed mothers than in unemployed mothers, although it was not statistically significant. Employed mothers have better CSS than unemployed mothers, although it is not statistically significant.

Key words: Child Survival Strategies, Growth and Development, Infants.

#### INTRODUCTION

According to recent estimates by the World Health Organization (WHO), United Nations Children's Fund (UNICEF), and United Nations Population Fund (UNFPA), nearly 3.3 million infants are stillborn each year, and more than 4 million die in the first 28 days of life. The highest number of infant mortalities was found in Southeast Asia (1.4) million infants were dead, and 1.3 million infants were stillborn). However, the highest infant death and stillbirth rates were found in Sub-Saharan Africa. (www.history.com). In 2015, based on the evaluation of the Millennium Development Goals (MDCs), maternal and neonatal mortality rates in Indonesia still reached 305 deaths per 100,000 live births. The minimum target set by the United Nations (UN) is 102 deaths per 100,000 live births.

The South Sulawesi Provincial Government, through the health Office, stated that South Sulawesi currently has a fairly high infant mortality rate. From January to September 2018, a total of 870 infants died. According to these data, the highest mortality rate was recorded in Bone District (Celebesmedia.id, Tuesday 11/13/2018).

Stimulation is a basic need for children and plays an essential role in increasing and optimizing their growth and development. The stimulus provided by parents can take the form of visual, verbal, auditory, tactile, and other stimulations. Parental attention, warmth, touch, hugs, smiles, and love are part of the parenting pattern of every mother.

Filmer (2003) states that socioeconomic factors are the main cause of child mortality. Child mortality and child nutrition are influenced by the supply and demand sides. The demand side here includes household and individual behavior or characteristics such as sanitation, disease prevention measures in the family, income, education, and parental knowledge. Better sanitation, disease prevention measures in the family, income, education, and parental knowledge can lead to lower child mortality and better child nutrition.<sup>1</sup>

It can influence child growth and development and must be considered from an early age, considering that children are the next generation of the nation who have the right to achieve optimal development. Therefore, it takes children with good quality for a better future for the nation. The golden age period is a critical period that occurs once in a child's life, starting from the age of 0 to 5 years.

#### Research question

Based on the above description, this study seeks to answer what are the effects of child survival strategies



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on the growth and development of infants of employed and unemployed mothers aged 0-6 months in Makassar City.

#### **RESEARCH OBJECTIVES**

#### The objectives of this study include:

Analyzing the effects of child survival strategies (gross motor skill development) of employed and unemployed mothers on the growth and development of infants aged 0-6 months in the Tamanlarea Health Center area in Makassar City.

Analyzing the effects of child survival strategies (fine motor skill development) of employed and unemployed mothers on the growth and development of infants aged 0-6 months in the Tamanlarea Health Center area in Makassar City.

Analyzing the effects of child survival strategies (sosial personal skill development) of employed and unemployed mothers on the growth and development of infants aged 0-6 months in the Tamanlarea Health Center area in Makassar City.

Analyzing the effects of child survival strategies (speech and language skill development) of employed and unemployed mothers on the growth and development of infants aged 0-6 months in the Tamanlarea Health Center area in Makassar City.

#### LITERATURE REVIEW

#### Child growth factors

Child development can be checked with the Denver II test according to developmental age. Child development includes the development of gross motor skills, fine motor skills, social personal skills, as well as speech and language skills (Ministry of Health of the Republic of Indonesia, 2010).<sup>3</sup>

#### Gross motor skill development

Gross motor skill development is part of motor activities involving large or gross muscle skills. The ability to use large muscles for children is a basic movement ability.

At the age of 3-4 months, infants' gross motor skills include maintaining an upright and stable head position, proning, and maintaining a stiff neck when both hands are slowly pulled (Ministry of Health of the Republic of Indonesia, 2010).<sup>3</sup>

#### Fine motor skill development

The development of fine motor skills has an important role in the development of artistic skills. In addition, the development of fine motor skills is very essential, especially when a child holds a pencil or writing utensil properly and correctly. It is also a child's ability to observe things and perform movements that involve certain body parts and small muscles and require proper coordination.

In early childhood, their gross motor skills develop earlier than their fine motor skills. It can be seen when children are able to walk using their leg muscles, and then they can control their hands and fingers to write, draw, stick something to something, or cut something.<sup>4</sup>

### Sosial personal skill development

Sosial personal skills are infants' independent abilities to socialize and interact with the environment. This development is indicated by various signs, including smiling and starting to look at other people's faces to recognize someone.<sup>5</sup> At the age of 3-4 months, infants will smile spontaneously, return spontaneous smiles, and observe their hands.

#### Speech and language skill development

Speech and language skills are infants' abilities to respond to sounds, follow commands and speak spontaneously. Language skill development at this age is indicated by their ability to speak (cry) and react to sounds or bells.<sup>5</sup> In infants aged 3-4 months, these language skills include imitating the sound of words, looking towards the sound, shouting, and laughing or making sounds/being happy.

#### **Child Survival Strategies**

Mosley and Chen (1984) divide the variables that affect child survival into two categories, namely; (1) Exogenous or socioeconomic variables (such as cultural, social, economic, community, and regional factors) and; (2) Endogenous variables or biomedical factors (such as breastfeeding patterns, hygiene, sanitation, and nutrition).<sup>6</sup>

Based on the Convention on the Rights of the Child (CRC), the Indonesian Government adopted the articles of the CRC in Law number 23 of 2002 concerning Child Protection. The Indonesian Government even interprets the articles of the CRC by providing opportunities for the community (Chapter III article 25) and establishing the Indonesian Child Protection Commission as an independent government body (Chapter XI articles 74-6).

Various policies have been implemented by the Government to ensure the growth and development of children/toddlers and achieve an even distribution of public health. In principle, providing health services for the community is a shared responsibility between the central Government and local governments. It is expected that each party contributes to providing optimal services.

The health services that have been implemented by health centers (puskesmas), integrated health service posts (posyandu), and hospitals, especially for children/infants, include; immunizations, regular monthly weight control, and vitamin A administration. Through the National Movement for Monitoring Child Growth and Development stipulated on July 24, 2005, the President of Indonesia invites all parties to monitor child growth and development from now on for their better life and future.

In South Sulawesi, since 1998, the KIA (maternal and neonatal health) book, which pregnant mothers should bring every time they visit a health care facility from pregnancy until the child is five years old, has been utilized to monitor child growth and development. The Movement includes:

Weighing infants and toddlers every month at integrated health service posts

Feeding only breast milk for infants aged 0-4 months

Feeding complementary foods to infants from 6 months old

Administering vitamin-A every six months and providing balanced nutritional food with iodized salt

Striving for complete immunization for infants before 12 months old

Stopping drug abuse and crime, avoiding smoking, and preventing AIDS

Ensuring a healthy and desirable pregnancy to allow mothers to give birth to healthy children safely

Strengthening family affection to maintain children's emotional stability and eliminating violence against girls.

Strengthening religious life and noble character since pregnancy

Providing opportunities to learn and play from an early age according to their growth

Monitoring and maintaining child health and seeking immediate treatment from health workers when the child gets sick

Applying the norms of a small, happy, and prosperous family to support the development of a smart and tough generation

Adopting a clean lifestyle and providing a healthy environment for healthy children and families

#### **RESEARCH METHOD**

## Research design

It is an observational study with a case-control design. To determine whether there is an effect of the independent variable on the dependent variable, the Chi-Square test was used. This study utilizes a questionnaire, and according to Stevens, each list of questions is prepared and used to obtain information about a matter.<sup>7</sup>

The Observation Unit consists of case and control population groups as follows:

The case population group includes 25 employed mothers.

The control population group includes 50 unemployed mothers.

Then the total respondents consist of 75 employed and unemployed mothers.

#### **RESULTS**

#### Respondents overview

Respondents in this study consisted of 75 mothers, of which 25 were employed, and 50 were unemployed, aged between 20-39 years, with an average of  $28.6 \pm 4.5$  years. Table 1 below presents the characteristics of the respondents.

The table above indicates that most of the respondents' husbands are self-employed (52.7%), and most have graduated from college (54.7%). So, it can be seen that educational participation among men has increased, from compulsory education programs up to 12 years until graduating from college. However, in the table, 6.6% of married men did not finish high school (compulsory education), most of whom came from low-income groups. Thus, it can be concluded that there is still a dropout population among urban communities. Similar findings were obtained in a study by Denny Soetrisnaadisendjaja and Nurkartika Sari regarding the phenomenon of children dropping out of school, which remains a complex problem in Indonesia today. The large number of children dropping out of school remains an unfinished work for Indonesia for a long time. Indonesia is the country with the second highest high school dropout rate after China.8

Table 1: Body weight growth guidelines for infants aged 0-1 year (Ministry of Health of the Republic of Indonesia, 2012).

Infant's Age (Months)	Body Weight (grams)
0	2,700-3,000
1	3,400-4,000
2	4,000-4,700
3	4,500-5,400
4	5,000-6,000
5	5,500-6,500
6	6,000-7,000
7	6,500-7,500
8	6,800-8,200
9	7,300-8,500
10	7,600-9,000
11	8,000-9,500

Table 2: Body length growth guidelines for infants aged 0-1 year (Ministry of Health of the Republic of Indonesia, 2012).<sup>2</sup>

Infant's Age (Months)	Body Length
0	40.5-50.5
1	43.5-55.5
2	46.0-58.0
3	48.0-60.0
4	49.5-62.5
5	51.0-64.5
6	52.5-66.0
7	54.0-67.5
8	55.5-69.0
9	56.5-70.5
10	57.5-72.0
11	58.5-73.5
12	60.0-74.5

Table 3: Distribution of respondent's characteristics (n=75).

Variables		n	%
Occupation	Employed	25	33.3
	Unemployed	50	66.7
Husband's Occupation	Self-employed	32	42.7
	Private employees	20	26.7
	Civil Servant	12	16.0
	Labor	6	8.0
	Others	5	6.7
Husband's Education	Elementary School	1	1.3
	Middle School	4	5.3
	High School	29	38.7
	University	41	54.7

The table above presents that the good child growth and development category is more common than the poor category. Similarly, CSS conducted by respondents was found to be more in the good category (41) than in the poor category (34) because the information related to child survival strategies in urban areas is disseminated faster and gets more responses from the public. In particular, information on child growth and development has received more serious attention among mothers, and the attention of integrated health service post cadres in every health center has an active role in monitoring every effort to child survival. In addition, the utilization of the scheduled integrated health service posts has been carried out well. However, the poor CSS category reaches 45.3%. In urban areas, it should be lower. This number comes from underprivileged families whose husbands' income is below the standard of living wages as a result of layoffs during the Covid19 pandemic.

The COVID-19 pandemic resulted in the layoff of 15.6 percent of workers in Indonesia, even 13.8 percent of whom did not receive severance pay. The majority of the laid-off workers are aged 15-24 years. Some of the worst sectors that require special attention are the construction sector (29.3 percent), the trade, restaurants, and services sectors (28.9 percent), and the transportation, warehousing, and communication sectors (26.4 percent). Layoffs without severance pay are a form of violation of Law No. 13 of 2003 concerning employment.<sup>9</sup>

The anthropometry of infants of employed and unemployed mothers indicated no significant differences, both in terms of age, body weight, and body length (with p > 0.05). Anthropometry is a method to directly assess nutritional status, especially the energy and protein state of a person's body, and is an indicator of nutritional status related to protein-energy malnutrition (PEM). The results of this study explain that the infants of both employed and unemployed mothers have balanced body

weight and body length (no difference). Thus, it can be assumed that the protein-energy state (nutritional status) of infants of both employed and unemployed mothers is not different.

The results of another study show that almost all children (95%) involved have normal nutritional status; 96.66% of them have normal head circumference; 96.23% of them experience appropriate development; 98.73% of them have a normal vision; 97.5% of them have a normal hearing; 94.17% of them have normal emotional behavior problems, and 95.83% of them do not experience attention deficit hyperactivity disorder.<sup>1</sup>

Based on the nutritional intake of the infants, Table 4 presents that most of the respondents (both those employed and those unemployed) breastfeed their infants, and only two of them feed their infants with formula milk. The nutritional intake of the infants of employed and unemployed mothers was not significantly different (p > 0.05). Breast milk is an ideal food for infants, and it contains the nutrients they need in the right amounts and antibodies for their health. In addition, breastfeeding can develop a closer relationship between infants and their mothers and does not incur a lot of economic costs. The results showed that all mothers, employed and unemployed, are able to exclusively breastfeed their infants. Thus, it can be assumed that integrated health service posts provide adequate education. In addition, all of them have a comprehensive knowledge of the importance of breastfeeding for their infants.

#### Child growth and development analysis

There was a significant correlation between mothers' occupations and their infants' fine motor skill development category (p < 0.05). It was found that the percentage of either category was higher in employed mothers (72.0%) than that in unemployed mothers (46.0%). As for the poor category, it was found to be higher in unemployed mothers (54.0%) than that in employed mothers (28.0%).

The difference in motor skill development of infants aged 0-6 months who were fed breast milk and complementary foods with p=0.00 and a score of 1.63. It means that infants who were fed breast milk had better motor skill development than those fed complementary foods. It indicated that infants' motor skill development was not only influenced by the provision of breast milk or complementary foods but also by genetic, age, and socio-cultural factors as well as parental care/parental stimulation (Tanuwijaya, 2003). Thus, the involvement of parents in raising their children/infants is not entirely under the hands of the mother.

Table 4: Distribution of infant growth and development and CSS categories by respondents (n=75).

Variables		n	%
Fine Motor Skill Development Category	Good¹	41	54.7
	Poor	34	45.3
Gross Motor Skill Development Category	Good	38	50.7
	Poor	37	49.3
Language Skill Development Category	Good	47	62.7
	Poor	28	37.3
Social Personal Skill Development Category	Good	53	70.7
	Poor	22	29.3
CSS Categories <sup>2)</sup>	Good	41	54.7
	Poor	34	45.3

 $<sup>^1</sup>$ Good criteria if the variable score > Median, Poor criteria if the variable score <= Median

Table 5: Comparison of infant anthropometry according to the mothers' occupation.

Variables	Occupation	n	Mean	Standard Deviation xxx	p*
Infants' Age	Employed	25	3.9	1.8	0.700
(months)	Unemployed	50	3.7	1.6	
Commont DIAI (lea)	Employed	25	6.4	2.4	0.462
Current BW (kg)	Unemployed	50	6.0	1.7	
Current BL (kg)	Employed	25	63.4	9.5	0.123
Current BL (kg)	Unemployed	50	59.6	10.1	

<sup>\*</sup>Two-Sample T-Test BW = Body Weight BL = Body Length

Table 6: Comparison of infant nutritional intake by the mothers' occupation.

Nutritional Intake		Occupation		- Total	
		Employed	Unemployed	- iotai	
Breast Milk	n	17	44	61	
breast wilk	%	68.0%	88.0%	81.3%	
Others	n	7	5	12	
Others	%	28.0%	10.0%	16.0%	
Formula Milk	n	1	1	2	
FOITHUIA WIIK	%	4.0%	2.0%	2.7%	
Total	n	25	50	75	
Total	%	100.0%	100.0%	100.0%	

Chi-Square Test (p = 0.108)

The roles of women highlighted in Indonesia are only their reproductive and social roles. The strong patriarchal culture in Indonesia still causes many men to be the main determinants of any decision in the family. However, there are also many women who decide to become housewives and continue to pursue their careers. For women who choose to continue to work after marriage and have children, this may indeed be a bit of a hassle. Sometimes, women who work (pursue their careers) feel tired because they still have to fulfill their responsibilities as housewives after work. The results showed that the ability of employed mothers to pay attention to their infants' fine motor skill development was better than that of unemployed mothers. Thus, it can be assumed that the level of cerebellum development of the infants of working mothers is more focused.

There was no significant relationship between mothers' occupations and their infants' gross motor skill development category (p > 0.05). Although statistically, there was no such correlation, Table 6 shows that the percentage of either category is higher in employed mothers (60.0%) than that in unemployed (46.0%). Gross motor skill development includes balance and coordination between body parts such as standing, sitting, crawling, walking, jumping, and running. The results of this study showed that the gross motor skill development of infants of employed mothers was better than that of infants of unemployed mothers. In this study, it was found that employed mothers tend to massage their infants. According to the results of the interviews, the respondents stated that massage helps their infants sleep more soundly and makes their movements more agile. It is in line with a study by the Touch Research Institute in Miami, United States, that massage affects the nervous system. Pressure on nerve receptors in the skin can cause dilation of veins, arteries, and capillaries, which can inhibit constriction, relax muscle tension, slow down the heart rate, and increase bowel movements in the digestive tract.11 In addition, one of the causes is that the infants of employed mothers can move freely. And while it is important to understand that partners share tasks in parenting, the role of fathers also contributes to the infants' gross motor skill development. Unemployed mothers tend to have more dominant roles in child care.

<sup>&</sup>lt;sup>2</sup>CSS = Child Survival Strategies

There was no significant relationship between mothers' occupations and their infants' language skill development category (p > 0.05). Although statistically, there was no such correlation, Table 7 shows that the percentage of either category is higher in employed mothers (68.0%) than that in unemployed (60.0%).

Speech and language skills are infants' abilities to respond to sounds, follow commands and speak spontaneously. Language skill development at this age is indicated by their ability to speak (cry) and react to sounds or bells. In infants aged 3-4 months, these language skills include imitating the sound of words, looking towards the sound, shouting, laughing, or making sounds/being happy.<sup>12</sup>

Several studies on the correlation between language skill development and family socioeconomic status reveal that children from poor families experience delays in language skill development compared to those from economically-better families. The results of this study explain that employed mothers have economically-better backgrounds, while unemployed mothers have economically-poor backgrounds.

There was no significant relationship between mothers' occupations and their infants' social personal skill development category (p > 0.05). Although statistically, there was no such correlation, Table 8 shows that the percentage of either category is higher in employed mothers (80.0%) than that in unemployed (66.0%). Social personal skills are infants' independent abilities to socialize and interact with the environment. This development is indicated by various signs, including smiling and starting to look at other people's faces to recognize someone. At the age of 3-4 months, infants will smile spontaneously, return spontaneous smiles, and observe their hands.  $^{12}$ 

Social personal skill is one of the categories of child development related to infants' independent abilities to interact with the environment. The results of this study indicated that the social personal skill development of infants of employed mothers was better than that of infants of unemployed mothers. It is assumed that employed mothers have closer relationships with their infants and a variety of toys that allow their infants to be independent.

Table 7: Correlation between mothers' occupations and their infants' fine motoric skill development category.

Fine Motor		Skill	Occupation	l .	— Total	
Develo	pment Cat	egory		Employed	Unemployed	Total
	Good	n		18	23	41
	Good %			72.0%	46.0%	54.7%
		n		7	27	34
	Poor %			28.0%	54.0%	45.3%
T-4-1			25	50	75	
Total		%		100.0%	100.0%	100.0%

Chi-Square Test (p = 0.033)

Table 8: Correlation between mothers' occupations and their infants' gross motoric skill development category.

Gross	Motor	Skill Occupati	Total	
<b>Development Category</b>		Employe	d Unemployed	
C	n n	15	23	38
GC	ood %	60.0%	46.0%	50.7%
n n		10	27	37
Po	Poor %		54.0%	49.3%
T-4.1	n	25	50	75
Total	%	100.0%	100.0%	100.0%

Chi-Square Test (p = 0.253)

Table 9: Correlation between mothers' occupations and their infants' language skill development category.

Language Skill D	evelopment	Occupation	— Total	
Category		Employed	Unemployed	iotai
Good	n	17	30	47
Good	%	68.0%	60.0%	62.7%
D	n	8	20	28
Poor	%	32.0%	40.0%	37.3%
T . 1	n	25	50	75
Total	%	100.0%	100.0%	100.0%

Chi Square Test (p = 0.500)

Table 10: Correlation between mothers' occupations and their infants' social personal skill development category.

Social	Person	al	Skill Occupation	kill Occupation		
<b>Development Category</b>		Employed	Unemployed	— Total		
	C 1	n	20	33	53	
	Good	%	80.0%	66.0%	70.7%	
	n n	n	5	17	22	
	Poor	%	20.0%	34.0%	29.3%	
TT . 1		n	25	50	75	
Total		%	100.0%	100.0%	100.0%	

Chi-Square Test (p = 0.209)

Table 11: Correlation between mothers' occupations and their child survival strategy category.

CSS Categories		Occupation	Occupation	
		Employed	Unemployed	— Total
Good	n	15	26	41
Good	%	60.0%	52.0%	54.7%
Poor	n	10	24	34
1001	%	40.0%	48.0%	45.3%
T 1	n	25	50	75
Total	%	100.0%	100.0%	100.0%

Chi-Square Test (p = 0.512)

#### **CSS** analysis

Table 9 shows that there was no significant correlation between mothers' occupations and their child survival strategy category (p > 0.05). However, the percentage of either category was higher in employed mothers (60.0%) than that in unemployed mothers (52.0%). The child survival strategies for infants of employed and unemployed mothers indicated no significant differences. It implies that child survival strategies to prevent child morbidity and mortality do not interrupt the roles of women (mothers) who choose to pursue their careers and help the family economy, which is a crucial factor in child survival strategies. In addition, government policies need to be improved in empowering women to utilize integrated health service post services. It is in line with a study by Iyanam Victory Edet, Single Henry Effiong, Idung Alphonsus Udoh1, Udoh Sunday Bassey, and Akpanudo Emem that most of the mothers who visit postnatal clinics in health centers in suburban areas in south Nigeria have adequate knowledge of CSS, actually bad CSS practice in most components of CSS. Therefore, policymakers and stakeholders in the field of maternal and child health need to find more integrated strategies to ensure that women are empowered with adequate information, education, and communication about the importance of CSS practice as a means of controlling twin morbidity and mortality. In addition, education for girls as a means to empower their knowledge base and equip them to practice CSS with the accompanying benefits for children, mothers, families, and society in general is hereby emphasized.13

#### CONCLUSIONS

There is a significant correlation between mothers' occupations and their infants' fine motor skill development category, where infants' of employed mothers tend to have better fine motor skill development than that of unemployed mothers.

The percentage of growth and development of other infants that fall into the good category was found to be higher in employed mothers than in unemployed mothers, although it was not statistically significant.

Employed mothers have better CSS than unemployed mothers, although it is not statistically significant.

#### **SUGGESTION**

It is necessary to provide counseling or training to unemployed mothers regarding child growth and development, especially fine motor skill development in infants.

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