

# Exclusive Breastfeeding on Infants Aged 0–6 Months Against the Cognitive Abilities in Children Aged 7–8 Years in Indonesia (Longitudinal Study of IFLS 2000 and 2007)

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## ABSTRACT

One important factor in shaping the quality of human resources as a determinant of the success of national development is adequate intake of nutrients, especially during the period of the first 1,000 days of life. In this period, children are susceptible to nutritional disorders, such as impaired growth (stunting), which are known to impair cognitive and motor development of children under five. However, malnutrition is still likely to be corrected if treated immediately. To achieve this, one possible intervention is by providing breastfeeding since newborn until the age of 24 months. Objective: The purpose of this study was to confirm that breastfeeding in infants aged 0-6 months can improve the cognitive abilities of children aged 7-8 years in Indonesia. Method: This study used cohort data of IFLS3 and IFLS4 (Indonesia Family Life Survey) in 2000 and 2007/2008, with a total sample of 492 people. Cognitive abilities were measured using test of Raven's Standard Progressive Matrices Result: The results showed that there was no significant correlation between breastfeeding and cognitive abilities in children, including the level of maternal education, father's education, birth weight, as well as changes in nutritional status of infant aged 0-6 months until 7-8 years. It was suggested that efforts to improve nutrition at an early age, particularly at the first 1,000 days of life, should be prioritized, not only by the health sector but also by other related sectors, through participation of all elements, including private sectors and other related community organizations. Conclusion: There was no correlation between the very significant breastfeeding in infants 0-6 months of the ability of this is the cognitive breastfeeding should be given as an infant birth to baby 24 months old.

**Keywords:** *breastfeeding, changes in nutritional status, cognitive ability*

## 1. INTRODUCTION

One important factor in forming human resources is intake quality nutrients adequate started since the fetus in the womb reached the age of 24 months or of the so-called as 1000 the first day of life. Period window of opportunity [1]. Acceleration decline stunting from Ministry of Health Indonesia to nutrition specific intervention: breastfeeding exclusive, the provision of breastfeeding until the age of 2 years accompanied by with food a companion breastfeeding adequate [2]. Government regulation the Republic Of Indonesia No 33 year 2012 on the provision of the exclusive of a guarantee of fulfilling the right place since get exclusive baby was born to six months old for growth and development [3].

Health Research Basic the percentage the provision of exclusive breastfeeding in the last 24 hours and without

acts of give them their food and drink in addition to breastfeeding at the age of 6 months is 30.2 % amounting to initiation sucking child early less than an hour after the baby is born is 34.5%, highest in West Nusa Tenggara, at 52.9% and lowest in West Papua (21.7%). Feeding only breastfeeding alone in the last 24 hours in infants were 6 months old increased from 15.3% for years 2010 be 30.2%, the same applies to breast feeding initiation early. Breastfeeding to 1 hour increased from 29.3% for 2010 be 34.5% (MoH,2010,2013) [4,5].The proportion of the provision of breastfeeding alone in the last 24 hours in infants thrashed 0-5 months to age group as much as 74.5.(MoH, 2018) [6].

## 2. METHOD

This study used cohort data of IFLS3 and IFLS4 (Indonesia Family Life Survey) in 2000 and 2007/2008. The research uses to measure the body length and the conversion in infants aged 0-6 month to 7-8 years old. This study using two data sets cohort IFLS-3 year 2000 (0-6 months old baby) and IFLS-4 years 2007-2008 (7-8 years old), with a total sample of 492 people. Will on data in one household consisting of several household members. The study was conducted in 13 ILFS province of 27 provinces in Indonesia. The province was chosen for the purpose of the Indonesian population estimate about 83 percent.

Data collection IFLS-3 conducted in July - December 2000, while the data IFLS-4 carried out in November 2007 to May 2008. Inclusion criteria are : 1).The children born alive, 2).Children stay with parents (father and mother), 3).Baby measured the body length the age of 0-6 months and the measured height the age of 7-8 years, 4).Children are weighed heavy born, 5).To are still live to age 7-8 years. Data anthropometry (height, weight, date of birth, date of measurements anthropometry data cognitive ability, of parity, education of the mother and education). Cognitive abilities were measured using test of Raven's Standard Progressive Matrices.

Analysis data using the method of analysis multivariate by test regression logistics for judging of the influences of the provision of breastfeeding age 0-6 months of the ability of cognitive age children 7-8 years. The steps of experiment model regression logistics done as follows: a).first one was done selection candidates the independent variable ( $p \leq 0.25$ ) covers test chi square b).second done selection regression logistics double covering the method estimation and undertaken in stages by significant partial  $< 0.10$ . c).third undergone a confounding and the interaction. In this research not found variable confounding.

## 3. RESULTS AND DISCUSSION

The results showed that there was no significant correlation between breastfeeding and cognitive abilities in children, including the level of maternal education, father's education, birth weight, as well as changes in nutritional status of infant aged 0-6 months until 7-8 years. It was suggested that efforts to improve nutrition at an early age, particularly at the first 1,000 days of life, should be prioritized, not only by the health sector but also by other related sectors, through participation of all elements, including private sectors and other related community organizations.

A characteristic of an infant in the distribution of 0--6, age months sex as shown in table 1.

Table 1. A Characteristic of an Infant

A characteristic of an infant		(n = 492)	%
Age	0 - <1 month	68	13.8
	1 - <2 month	89	18.1
	2 - <3 month	80	16.3
	3 - <4 month	88	17.9
	4 - <5 month	85	17.3
	5 - <6 month	82	16.7
Gender	Male	270	54.9
	Female	222	45.1

Table 2. A Characteristic of Children

A characteristic of children		(n = 492)	%
Age	7 Year	362	73,6
	8 Year	130	26,4

Table 3. The Cognitive Children

The cognitive ability.		(n = 492)	%
Cognitive ability the under the average		239	48.6
The ability cognitive child under the average		253	51.4

The experimental intervention led to a large increase in exclusive breastfeeding at age 3 months and a significantly higher prevalence of any breastfeeding at all ages up to and including 12 months. The experimental group had higher means on all of the Wechsler Abbreviated Scales of Intelligence measures [7].

Results of study to reported that intelligence quotient (IQ) was 3.44 points higher among subjects who had been breastfed, and this association was observed even among those studies that controlled for maternal IQ. In the present review, we identified studies that reported that duration of breastfeeding was positively associated with IQ in childhood, whereas another study reported that cognitive was higher among those subjects who had been breastfed for at least 6 months [8].

Concerning the possible mechanisms for the effect of breastfeeding on development, children who had been breastfed showed greater gray matter volume in the left and right parietal and left temporal lobes and more activation in the right frontal and temporal lobes for perception tasks, whereas for the language task, the activation was higher in the left temporal lobe. In addition, this association between breastfeeding and development has long-term consequences on human capital, increasing [9]. In high-income countries, income is positively associated with breastfeeding duration [10].

A critical process in neural development is myelination, which is very rapid in the first two years after birth and, thereafter, continues at a slower pace throughout childhood and adolescence [11]. Arachidonic acid (AA) and Docosahexaenoic Acid (DHA) are important lipid components for the development of cell membranes, mainly retinal and central nervous system cells. These long-chain fatty acids are present in breast milk, but not in

most infant formulas [12]. AA and DHA accumulate in the brain and retina faster during the last trimester of pregnancy and in the first months after birth [13].

A study in Australia with 302 children did not find an association between duration of BF and children's intelligence quotient (IQ). Quality of home environment was the strongest IQ predictor at age 4 years [14].

The differential of this study is that it was one of the first to be performed in Brazil and, even after adjustment for potential confounding factors, important socio economic factors and breastfeeding at six months of age remained associated with the outcome. This finding reinforces the WHO recommendations to encourage mothers to breastfeed their children, especially in the first year of life [15].

The first day of life is a period of transition and a critical window of risk for the newborn. During this time, successful establishment of breastfeeding is essential, and challenging. Only 45% of the 140 million live-born newborns born each year are breastfed in the first year of life, and little improvement has been observed in this indicator over the past 15 years. In many countries, cultural practices of early newborn ritual feeding with sugar water, tea, honey, or animal milk are prevalent, and there is emerging evidence that these interfere with the provision of colostrum and delay the timely initiation of breastfeeding [16][17].

In a three-country study examining the timing of the initiation of breastfeeding and the risk of neonatal mortality, the risk of death was 41% higher in neonates who initiated breastfeeding at 2 to 23 hours, and 79% higher in infants initiating breastfeeding at 24 to 96 hours, compared with those fed in the first hour of life [18]. The mechanisms through which the early initiation of breastfeeding influences the risk of mortality require more exploration, but may include greater consumption of colostrum (the first milk, which is rich in certain micronutrients and immune substances), warmth from contact with the mother, and strengthened gastrointestinal barrier integrity [18].

WHO recommends that all infants are exclusively breastfed for the first 6 months of life, a practice defined as the exclusive consumption of breast milk, and medicines or vitamins/minerals as needed. Only 43% of infants were exclusively breastfed in 2015 [19]. The same three-country study described earlier found that compared with exclusive breastfeeding, partial breastfeeding and no breastfeeding at 1 month were associated with a 1.8 and 10.9 times greater risk of mortality during the first 6 months of life [18].

Nearly two-thirds of children are transitioned to semisolid or soft foods by 6 to 8 months, but far fewer children are transitioned to diets in which they are fed with the frequency or diversity recommended for healthy growth, or are breastfed well into the second year of life, as recommended by WHO and UNICEF (United Nations Children's Fund).

Breastfeeding may improve cognitive development through several potential mechanisms, related both to the composition of breast milk and to the experience of

breastfeeding. A suite of nutrients, growth factors, and hormones that are important for brain development are abundant in breastmilk, including critical building blocks such as DHA and choline [20-22].

Also, the physical act of breastfeeding may foster a positive mother-infant relationship and enhance mother-infant interaction, which are important for cognitive and socioemotional development. Breastfeeding also elicits a hormonal response in mothers during each feeding session, which may reduce stress and depression and thus improve infant caregiving and mother-infant interaction [23]. In high-income countries, children who are breastfed as infants tend to have higher IQs at school-age than children fed with formula. Meta-analyses have yielded pooled estimates of 3–5 IQ points favoring children who had been breastfed, [24-26] with higher estimates among those born with low birth weight (5–8 IQ points).<sup>120,121</sup> However, not all studies have found this positive relationship [27] and this relationship may be confounded by other factors, since mothers from higher socioeconomic backgrounds and with higher IQs are generally more likely to breastfeed in high-income countries [28,29].

## 4. CONCLUSION

The provision of breastfeeding should be given a baby up to the age of 24 months if, granting breastfeeding lacking nothing given for 24 the moon would be have an effect on children cognitive ability

Conflict of Interest: There is no conflict of interest

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