

THE RELATIONSHIP BETWEEN EXCLUSIVE BREASTFEEDING AND SPEECH DEVELOPMENT IN CHILDREN 6-12 MONTHS

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Abstract

Exclusive breastfeeding without additional foods is related to the distribution of nerves in speech development. When the breastfeeding process is repeated, it can train the child's voice-forming muscles and mouth structure. An interesting problem is that previous research shows that there is no relationship between exclusive breastfeeding and children's speech development. The assessment used is Denver II. This study aimed to assess the speech development of normal or suspected children. The sample was carried out by purposive sampling. The number of respondents in this study was 141 people, 75 boys (55.3%) and 66 girls (45%). Exclusive breastfeeding data was obtained for 105 respondents, of whom 89 respondents (84.8%) had normal speech development, and 16 respondents (15.2%) were suspect. Meanwhile, 36 respondents were not given exclusive breast milk, 30 respondents (83.3%) had normal speech development and 6 respondents (16.7%) were suspect. A statistically insignificant relationship between exclusive breastfeeding and the speech development of children aged 6-12 months at Puskesmas Grogol Petamburan, Jakarta Barat with a p-value of 1,000 ($p > 0.05$). This research involves various factors that can influence speech development apart from exclusive breastfeeding, so further research is needed to identify factors that can influence children's speech development.

Keywords: Exclusive Breastfeeding, Speech Development, Children

Introduction

The main food for children is breast milk, it's consists of fatty acids, amino acid lactose, and water in quantities that are ideal for children's brain development. It also contains high levels of docosahexaenoic acid (DHA; 22:6 n-3) and the main form of long-chain n-3 polyunsaturated fatty acids (LC-PUFAs). DHA accumulates actively in the brain during early development where it plays an important role in neurotransmission and neurodevelopment.¹ According to research by Hye Jeong Choi et al. (2018) it's stated that the importance of exclusive breastfeeding in children less than 4 months old has a very significant effect on improving the risk of delayed development in terms of the child's adaptability and speaking ability later in life.² According to neuroimaging studies in children who were fed formula milk, there was a decrease in the volume of the subcortical white area and gray area compared to children who were breastfed. This is related to the distribution of nerves related to language development.³ Almost the entire contents of a child's mouth is occupied by the tongue, which means that the entire sucking and swallowing process depends on the tongue.⁴ Therefore, Early Breastfeeding Initiation can directly train the movement of the child's tongue, lips, cheeks, and jaw. If the breastfeeding process is repeated, it trains the development of the child's voice-forming muscles and mouth structure.⁵ This is an interesting problem to discuss. Remember, the initial stage of speaking

greatly influences the progress of subsequent speaking. Where exclusive breastfeeding plays a very important role in a child's speech development.

Based on Riset Kesehatan Dasar (RISKESDAS) report in 2022, Daerah Khusus Jakarta has the second lowest percentage of breastfeeding on the island of Java. The percentage of exclusive breastfeeding in the capital city reached 59.58%. This is a decrease of 19.52% compared to the previous year.⁶ Where in 2021, exclusive breastfeeding coverage in Daerah Khusus Jakarta will be 79.1%.⁷ According to the Indonesian Ministry of Health, it is reported that there are 0.4 million (16%) toddlers experiencing speech delays. RISKESDAS 2013, it is said that children who experience speech delays is increasing day by day, namely around 2.3% -24.6% of children. In Indonesia, people experience speech delays. The prevalence of speech delays in school children is between 5%-10% (Suparmiati, Ismail, & Sitaresmi, 2019).⁸ With the decreasing percentage of exclusive breastfeeding, this has a big impact on the speaking fluency of preschool children. According to research by Kyoung Min Kim et al. (2020), it was found that in children who were given exclusive breast milk, there was an increase in the child's cognitive function and speaking.⁹ From the research journal Ebtissam et al. (2019) it was stated that there were problems with the development of speech in children who were introduced to food. Baby-led weaning (BLW) and use of bottles before 6 months.¹⁰ This is also supported by research by Eales et al. (2020) that giving direct breast milk, colostrum, and exclusive breast milk improves children's speech and cognitive development.¹¹ However, Hamida et al's. research, (2023) said there is no influence between exclusive breastfeeding and non-exclusive breastfeeding on the speech development of children aged 6-24 months. ¹² The RISKESDAS data above shows a decrease in exclusive breastfeeding in Daerah Khusus Jakarta (DKJ) and a higher level of children's speech delays. This is interesting to research regarding several factors that can influence exclusive breastfeeding. This research aims to know the relationship between exclusive breastfeeding and children's speech development at Puskesmas Grogol Petamburan, Jakarta Barat. The research will be carried out on mothers and children aged 6-12 months because many factors can influence the assessment of speech development and intervention can be carried out as early as possible if there is a delay in speaking in children

Method

The research was carried out from January to February 2024 with 141 respondents in Puskesmas Grogol Petamburan, Jakarta Barat. Approached with cross-sectional and sample collection using purposive sampling from mothers and children aged 6-12 months who meet the predetermined inclusion and exclusion criteria. The inclusion criteria for this study are mothers and children aged 6-12 months, exclusive breastfeeding, a history of good health since birth and not suffering from chronic diseases. If mothers were willing to be respondents, they must sign a written informed consent. The exclusion criteria include unwillingness to undergo an examination and collect data.

Exclusive breastfeeding history is accessed with an interview questionnaire including how they give their breast milk and whether they breastfeed exclusively or not. Children who at first 6 months got breast milk only without complementary food were classified as exclusive breastfeeding.¹³ Regarding the method of breastfeeding given, it is classified as sucked directly into the breast, pure breast milk given with a bottle pacifier, or a mixture of both.

The speech development is measured using Denver II which has been validated. Denver II is specific to the age scale and results as normal or suspect. It will be interpreted based on the answer to the total score of 'Suspect' on the questionnaire listed in Denver II. It's called suspect if 'Warning' is ≥ 2 / ≥ 1 'Late'. Meanwhile, it is categorized to be normal if there are no delays/ maximum of 1 'Warning'.¹⁴ The comparison between exclusive breastfeeding and speech development in children

aged 6-12 months was analyzed with the Chi-Square test. The approval of ethical clearance has been obtained from Tarumanagara University No. 223/ KEPK/ FK UNTAR/ XI/ 2023.

Results

In this research, a sample of 141 mothers and their children aged 6-12 months participated as willing respondents. The characteristics of the research sample are summarized in Table 1. The study assessed the comparison between exclusive breastfeeding and speech development in children aged 6-12 months from various aspects. Respondents who were given exclusive breast milk, 105 respondents (74.5%) 89 respondents (63%) had normal speech development, and the other 16 respondents (11.3%) were suspected delay speech development. Apart from that with a total of 36 respondents (25.5%), 30 respondents (21.3%) had normal speech development, and 6 respondents (4.3%) were suspected of delayed speech development. The results of this research are presented in Table 2. This research has a 95% confidence interval.

Table 1 Characteristics of Research Results

Parameter	N (%)
Children's Gender	
Boys	75 (55.3%)
Girls	66 (45%)
Mother's Working Status	
Working	20 (14.2%)
Not Worked	121 (85.8%)
Gestational Age	
Normal Birth (37-40 weeks)	121 (85.8%)
Premature Birth	20 (14.2%)
Birth Weight	
Normal Weight (2500-4000 grams)	129 (91.5%)
Low Birth Weight (<2500 grams)	10 (7.1%)
High Birth Weight (>4000 grams)	2 (1.4%)
Exclusive Breastfeeding Method	
Direct to Breast	87 (61.7%)
Via Pacifier Bottle	4 (2.8%)
Both	17 (12.1%)

Table 2 The Relationship between Exclusive Breastfeeding and Speech Development in Children Aged 6-12 Months

Exclusive Breastfeeding	Speech Development Results		Total n (%)	RR	p-Value
	Normal	Suspect			
	n (%)	n (%)			
Yes	89 (84.8%)	16 (15.2%)	105 (100%)		
No	30 (83.3%)	6 (16.7%)	36 (100%)	1.017	1.000
Total	119 (84.4%)	22 (15.6%)	141 (100%)		

* Chi-square test analysis with yatest. The minimum expected count is 5.62.

Discussion

Based on the analysis of the results, it was found that exclusive breastfeeding was not statistically significant to speech development in children aged 6-12 months at Puskesmas Grogol Petamburan, Jakarta Barat with a p-value of 1.000 (p-value > 0.05). This is similar to a study from Hamida et al. (2023), who stated that there was no relationship between exclusive breastfeeding and speech development in children aged 6-12 months at Puskesmas Grogol Petamburan, Jakarta Barat.¹² In this study, researchers identified possible reasons why children who were breastfed exclusively may experience speech delays. This is related to external factors, such as low family income, which can influence parents' emotional pressure and in turn, affect their focus on their children's speech development. Lack of knowledge and attention from working mothers can also impact child development. Additionally, it has been found that children who were not exclusively breastfed still had normal speech development. Factors that can influence these include positive parenting patterns and a focus on children's cognitive development, which can improve their speaking abilities.

However, on the other hand, this research is not in line with Kyoung Min Kim et al. (2020) which states that there is a significant relationship between exclusive breastfeeding and speech development. It has been stated that exclusive direct breastfeeding has a protective effect on speech development, as well as supporting external factors.⁹

Conclusion

Speech development in children is caused by various factors. This study explains that exclusive breastfeeding and children's speech development are not statistically significant. There are several factors, such as the mother's working status, gestational age, birth weight, and exclusive breastfeeding method, which can potentially impact a child's speech development. It is important to note that there may be limitations in this research due to the use of a purposive sampling technique. Additionally, the distribution of respondents across certain variables was uneven.

Suggestion

Researchers conducting research similar to this topic may consider other factors influencing speech development besides exclusive breastfeeding. This research may open up insight into the importance of monitoring speech development, especially in children, to minimize the risk of speech delays as early as possible.

References

- [1] Juber BA, Jackson KH, Johnson KB, Harris WS, Baack ML. Breast milk DHA levels may increase after informing women: A community-based cohort study from South Dakota USA. *Int Breastfeed J*. 2017 Jan 28;12(1).
- [2] Choi HJ, Kang SK, Chung MR. The relationship between exclusive breastfeeding and infant development: A 6- and 12-month follow-up study. *Early Hum Dev*. 2018 Dec 1;127:42–7.
- [3] Deniz Can D, Richards T, Kuhl PK. Early gray-matter and white-matter concentration in infancy predict later language skills: A whole brain voxel-based morphometry study. *Brain Lang*. 2013 Jan;124(1):34–44.
- [4] Iskander A. Morphological Comparison Between Neonatal And Adult Human Tongues [Internet]. *Ann Otol Rhinol*. 2003. Available from: www.nlm.nih.gov/research.
- [5] Broad FE. The effects of infant feeding on speech quality. *N Z Med J* [Internet]. 1972 Jul;76(482):28—31. Available from: <http://europepmc.org/abstract/MED/4508379>
- [6] Laporan Kinerja Direktorat Jenderal Kesehatan Masyarakat Tahun 2022. 2022.
- [7] Riset Kesehatan Dasar (RISKESDAS). Laporan Kinerja Kementerian Kesehatan Republik Indonesia 2021. 2021.
- [8] Suparmiati A, Ismail I, Sitaresmi MN. Hubungan Ibu Bekerja dengan Keterlambatan Bicara pada Anak. *Sari Pediatri*. 2013;14(5).
- [9] Kim KM, Choi JW. Associations between breastfeeding and cognitive function in children from early childhood to school age: A prospective birth cohort study. *Int Breastfeed J*. 2020 Sep 29;15(1).
- [10] El-Din EMS, Elabd MA, Nassar MS, Metwally AM, Abdellatif GA, Rabah TM, et al. The interaction of social, physical, and nutritive factors in triggering early developmental language delay in a sample of Egyptian children. *Open Access Maced J Med Sci*. 2019 Sep 15;7(17):2767–74.
- [11] Eales B, Krüger E, Graham M, Van Der Linde J. Feeding and developmental outcomes of infants in a South African community. *Prim Health Care Res Dev*. 2020;21:1–8.
- [12] An-Nisa H, Souvriyanti E, Arifandi F. Pengaruh Pemberian ASI Eksklusif Dan ASI Non Eksklusif Terhadap Perkembangan Bayi 0-12 Bulan Di Rumah Sakit YARSI Jakarta Dan Tinjuannya Menurut Pandangan Islam. 2023;
- [13] Departemen Kesehatan RI J. Inisiasi Menyusu Dini (IMD) dan ASI Eksklusif 6 Bulan. 2008;1.
- [14] 524 I Appendix C DENVER II Developmental Screening Test (Reprinted with permission of DDM). Thomson Delmar Learning; 2007.