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Relationship between exclusive breastfeeding and stunting in toddlers

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ABSTRACT

Background: Stunting in children due to malnutrition needs serious treatment because it has an impact on children's growth and development. This study aimed to explore the literature on the correlation between exclusive breastfeeding and stunting in children.
Methods: This study used a literature review design by collecting published articles to explore the relationship between exclusive breastfeeding and stunting in children under five. Six journals were selected using keywords such as "exclusive breastfeeding," "stunting," and "toddler". The inclusion criteria comprised articles published within the last five years (2019–2024). Exclusion criteria included articles published before 2019, such as opinion pieces, editorials, or reviews lacking original study data
Results: The finding of this study found that exclusive breastfeeding helps prevent stunting in children, ensuring mothers can practice exclusive breastfeeding is crucial for improving long-term health outcomes.
Conclusion: Exclusive breastfeeding for babies during the first six months of life is essential to meet nutritional needs and increase their body's immunity, reducing the risk of stunting.

Keywords: children, exclusive breastfeeding, immunity, nutrition, stunting, toddlers

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Introduction

Health problems in children require more attention and handling from various parties. One of these problems is nutrition-related, affecting their growth and development.[1] Everyone should know their children's nutritional condition to anticipate and avoid under and overnutrition.[2] If not given good nutritional intake, children will risk cognitive decline, which can interfere with their productivity. Children with malnutrition will experience stunted physical growth, such as high growth and suboptimal weight. One of the disorders in children caused by nutritional problems is stunting.[3]

Stunting is a long-term nutritional disorder that affects growth and development from birth. Stunting is an obstacle caused by nutrient deficiencies and health concerns. Stunted children were identified based on a height index with a z-score of less than -2 standard deviations. Stunting is a chronic nutritional condition in children that requires time to develop and return to normal height for their age.[4] History of exclusive breastfeeding, low birth weight, economic factors, and maternal knowledge of good nutritional intake are some of the risk factors that may cause stunting.[5] In the short term, stunting, Left untreated, can affect brain development and physical growth that, when compared to children of the same age, will tend to be shorter, the body's metabolism is disturbed, and reduce children's immune system, thereby increasing their susceptibility to diseases over a long period.[3]

Level stunting in children under five in Indonesia is an urgent health problem. Indonesia is included in 17 out of 117 countries that face problems with stunting in children under five. The number of children under five who were stunted globally in 2020 reached 149.2 million, with the figure in Indonesia around 7.5 million or 27.7% in 2019, according to UNICEF. The World Health Organization (WHO) states that stunting exceeding 20% of the population can be considered a public health problem.[6]

Toddlers are particularly vulnerable to stunting at their age. Toddlers are fast-growing children between 0 and 59 months of age.[7] In 2020, undernutrition accounts for about 45% of fatalities among children by the age of five worldwide. Out of the four types of undernutrition, stunting had the highest prevalence. Stunting affects 144.0 million children under the age of five worldwide, according to the Global Nutrition Report 2018 and the number is still rising.[8] During

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the first thousand days of their life (including 270 days in the womb and 730 days after birth), nutritional deficiencies can cause this condition in children under five. What can be done to improve nutritional status is to give exclusive breastfeeding to children. The content in this breast milk can maximize children's growth so that children will avoid the risks of stunting.[3]

Various factors can inhibit breast milk production, so there will be failures in exclusive breastfeeding, which can have an impact on stunting events. These factors are the mother's physical activity, exercise, stress, and the food consumed by the mother.[9] Physical activity done by mothers that affects the strength of the pectoralis muscle will be one of the factors that can help breast milk come out smoothly.[10] For this reason, this study was made to find out how the role of physiotherapy is reviewed from breast milk production based on the level of maternal pectoralis muscle strength in meeting the exclusive breastfeeding needs of children and its effect on the incidence of breast milk stunting in children.

Methods

This study employed a literature review method, utilizing secondary data from peer-reviewed journal articles that examined the relationship between exclusive breastfeeding and stunting in children under five. A systematic search was conducted using the keywords' exclusive breastfeeding,' 'stunting,' and 'toddler' across relevant academic databases. A total of six journal articles were selected for review. The selection process followed specific inclusion and exclusion criteria. The inclusion criteria comprised articles published within the last five years (2019–2024), peer-reviewed journal publications, studies focusing on children under five years old, and studies investigating the relationship between exclusive breastfeeding and stunting. Exclusion criteria included articles published before 2019, such as opinion pieces, editorials, or reviews lacking original study data, studies addressing unrelated topics or age groups beyond children under five years old, and articles with incomplete data or unclear findings related to the study question.

Results

The review of six selected journal articles provided insights into the relationship between exclusive breastfeeding and stunting in children under five years old (Table 1). A study by Lestari, Zurrahmi, and Hardianti (2023) revealed a significant association between exclusive breastfeeding and stunting in toddlers aged 6 to 24 months. The analysis reported a p-value of 0.000, with a Prevalence Odds Ratio (POR) of 11.175, indicating that children not exclusively breastfed were 11.2 times more likely to experience stunting than those who received exclusive breastfeeding.

Hadi et al. (2021) examined household expenditure and breastfeeding practices, finding that households with below-average income and exclusive breastfeeding had a 20% chance of avoiding stunting. In contrast, families with above-average income had a 40% chance of preventing stunting without exclusive breastfeeding, and this increased to 50% with exclusive breastfeeding. Sampe, Toban, and Anung (2020) identified a strong correlation between exclusive breastfeeding and stunting, with a p-value of 0.000. Their findings showed that infants who did not receive exclusive breastfeeding had a 61-fold increased risk of growth delay, supported by an odds ratio of 61.

Gani et al. (2019) highlighted the impact of several factors, including exclusive breastfeeding ($p = 0.000$), child age ($p = 0.003$), and access to family latrines ($p = 0.004$), on stunting. Their study concluded that exclusive breastfeeding was the most significant factor influencing stunting reduction in children aged 0 to 59 months. Nababan et al. focused on breastfeeding techniques, emphasizing the effectiveness of Oketani Massage in relieving milk duct blockage in mothers. This method stimulated the pectoralis muscles, softened the breasts, enhanced milk production, and supported successful breastfeeding.

Finally, Latifah, Purwati, and Sukamto (2020) reported a chi-square test result ($p<0.000$) that demonstrated a significant relationship between exclusive breastfeeding and stunting in children aged 1 to 5 years. Among 48 participants, 42 mothers practiced exclusive breastfeeding, resulting in 41 non-stunted children and one stunted child. In contrast, six mothers did not breastfeed exclusively, with five children experiencing stunting and one remaining non-stunted. These findings collectively underline the critical role of exclusive breastfeeding in reducing the incidence of stunting and improving child growth outcomes.

Discussion

Growth and development is a process that goes hand in hand that lasts from birth to adulthood. The factor that affects the growth and development of children is sufficient nutrition. Providing nutritional intake according to needs will provide optimal body immunity for children to maximize growth because children rarely contract diseases. Good food for children aged 0-5 years can be fulfilled by exclusive breastfeeding at 0-6 months. Breastfeeding for six months without introducing food to the baby is called exclusive breastfeeding. The effect that can be caused if the child does not get exclusive breast milk is that there is malnutrition, which will interfere with his growth, called stunting.[3]

There is a correlation between exclusive breastfeeding and risk stunting in infants aged 6 to 24 months, according to a study by Rizki Rahmawati et al. in 2023. If the baby does not receive exclusive breast milk, then it will have a greater chance of stunting. Breast milk is essential to meet their nutritional needs at this stage of children's development.[11] Breastfeeding is the most effective strategy to meet newborns' nutritional demands and build their immune systems. Infants' immune systems mature by fighting illnesses and acquiring tolerance to their surroundings and microbiota. Breastfeeding has significant psychological effects on both infants and mothers.[12] Children

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Table 1. Results summary of the relationship between exclusive breastfeeding with incidents of stunting in toddlers

Title	Authors (Year)	Methods	Results
Pengaruh riwayat pemberian asi eksklusif dengan kejadian stunting pada ibu balita usia 6-24 bulan di Desa Gading Sari Kecamatan Tapung Tahun 2022.	Rizki Rahmawati Lestari, Zurrahmi Z.R, Sri Hardianti. 2023[11]	This cross-sectional study included 70 mothers of toddlers aged 6-24 months, using total sampling. A questionnaire assessed exclusive breastfeeding history and stunting incidence. The Chi-Square Test analyzed the relationship between these variables.	A significant correlation (P=0.000) was found between exclusive breastfeeding history and stunting in toddlers aged 6-24 months, with a Prevalence Odds Ratio (POR) of 11.2, indicating children without exclusive breastfeeding are 11.2 times more likely to experience stunting.
Exclusive Breastfeeding Protects Young Children from Stunting in a Low-Income Population: A Study from Eastern Indonesia.	Hamam Hadi et al., 2021[13]	This cross-sectional study included 408 caregivers of children aged 6-14 months from 14 villages in East Timor. Data were analyzed using the Chi-Square Test. Measurements used a questionnaire on breastfeeding and socioeconomic factors, a precision longboard, and WHO Anthro 2005 for z-scores. Independent variables were exclusive breastfeeding history, household expenses, maternal age, and knowledge; the dependent variable was stunting.	The study results indicate that households with below-average monthly expenses and exclusive breastfeeding have a 20% likelihood of avoiding stunting. In comparison, those with above-average expenses and no exclusive breastfeeding have a 40% likelihood. In contrast, households with above-average expenses and exclusive breastfeeding demonstrate a 50% likelihood of avoiding stunting.
Hubungan Pemberian ASI Eksklusif Dengan Kejadian Stunting Pada Balita	SR. Anita Sampe, SGMJ, Rani Claurita Toban, Monika Anung, et al. 2020[14]	This case-control study of 219 toddlers from Penatangan, Ranteberang, and Kebanga villages used Chi-Square analysis. A microtoise measured height, a questionnaire assessed exclusive breastfeeding history, and z-score tb/u determined nutritional status. Exclusive breastfeeding was the independent variable, and stunting incidence was the dependent variable.	The relationship between exclusive breastfeeding and the number of stunted infants was significantly related (P=0.000). According to a ratio odds test, babies who did not receive exclusive breast milk had a 61 times greater chance of growth delay than babies who received it, which yielded an OR value = 61.
Risk factors for stunting among children in Banggai Regency, Indonesia	Aspar Abdul Gani et al., 2019[17]	This cross-sectional study involved 285 children aged 0-59 months from Jaya Bakti Village, Central Sulawesi. Statistical analysis included Chi-Square and logistic regression. Data on age, gender, breastfeeding, and sanitation were collected via questionnaire, while height, weight, and upper arm circumference were measured. Independent variables included breastfeeding, energy deficiency, sanitation, and latrines, with stunting risk as the dependent variable.	The results of the study showed the significance of exclusive breastfeeding (p=0.000), child age (p=0.003), and availability of family latrines (p=0.004). The results of the study confirmed that exclusive breastfeeding has the most significant impact in influencing the incidence of stunting in children aged 0-59 months.

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Table 1. continued

The Effectiveness of Oketani Massage on the Prevention of Breast Milk Dams in Postpartum and Post-Cesarean Mothers	Tiarnida Nababan, Tinik Wicak, Nia Fineawi, Triana Anggreni Haloho, Yenni Anita Hutagalung[18]	This pre-experimental study involved 35 participants. The Wilcoxon test was used for statistical analysis. An observation sheet measured the effectiveness of Oketani massage in preventing breast milk blockage. The independent variable was Oketani massage, while the dependent variable was breast milk blockage.	Breast milk dams in breastfeeding mothers can be overcome with Oketani Massage because it can stimulate the pectoralis muscles so that the breasts become softer and more elastic to improve milk production.
Hubungan pemberian asi eksklusif dengan kejadian stunting pada balita 1-5 tahun.	Al Ma'idatul Latifah, Lina Ema Purwati, Fillia Icha Sukamto. 2020[19]	This cross-sectional study included 48 mothers and toddlers aged 1-5 years, selected using the Slovin formula. The Chi-Square Test was used for statistical analysis. Data was collected via a questionnaire on exclusive breastfeeding, with height and weight measured using a microtoise and scale. The independent variable was exclusive breastfeeding, and the dependent variable was stunting in toddlers.	Of the 48 people, 42 gave exclusive breastfeeding (41 did not experience stunting, and one experienced stunting), and six did not provide exclusive breastfeeding (5 experienced stunting and one did not experience stunting). The results of the calculation using the Chi-Square test showed the relationship between exclusive breastfeeding and stunting cases in toddlers aged 1-5 years, with a p <0.000.

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who are given food other than breast milk when they are 0-6 months old tend to face digestive problems. Children cannot get enough nutrients from those foods because their digestive system is not mature enough to digest foods other than breast milk.[11]

Hammam Hadi et al., in their 2021 study, found that increasing exclusive breastfeeding can be a strategy for reducing the number of stunting in Indonesia, especially in children from families whose monthly household expenses are below average. This is following the results of his study where children from families with monthly expenses below average have a 20% chance of not experiencing stunting if exclusively breastfed.[13]

A 2020 study by Sr. Anita et al. found that if toddlers do not receive exclusive breastfeeding, there is a risk of stunting 61 times higher than toddlers who are exclusively breastfed.[14] Breastfeeding is an essential protective factor for newborns. Colostrum, or mother's milk, contains immunologically active molecules, minerals, and vitamins necessary for newborn growth.[15] Breastfeeding promotes immunity, affection, motor development, personality, emotional intelligence, spiritual maturity, and positive social interactions. Breastfeeding fosters early physical and psychological contact between mother and baby, providing a sense of security and stimulating collaboration between brain networks, promoting infant development from an early age.[16]

According to a study conducted by Aspar Abdul Gani et al. in 2019, exclusive breastfeeding in the first 6 months of a baby's life after birth can reduce the likelihood of stunting in children aged 0-59 months. In addition, exclusive breastfeeding can also be considered until the child reaches the age of 2 years.[17] Tiarnida Hababan, in her 2020 study, said that breastfeeding mothers who get good stimulation of their pectoralis muscles can help milk production improve, which can help the success of exclusive breastfeeding.[18]

A study conducted by Al Ma'idatul Latifah et al. in 2020 stated a correlation between exclusive breastfeeding and the incidence of stunting in toddlers aged 1-5 years. The baby's body can optimally absorb breast milk to reduce the risk of stunting. Stunting In the short term, it can interfere with the physical growth and metabolism of the child, increasing susceptibility to diseases due to a decrease in the immune system. In addition, children who are often sick may experience a decline in cognitive ability and learning achievement. Therefore, exclusive breastfeeding can play a role in improving the nutritional status of toddlers, which in turn will support national efforts to reduce the prevalence of stunting in children.[19] So, exclusive breastfeeding can be done to reduce the incidence of stunting in children aged 1-5 years.[20]

This exclusive breastfeeding can be helped by the strength of the mother's pectoralis muscles. The pectoralis minor and major muscles are located in the chest, with the pectoralis minor muscle at the top and the pectoralis major muscle at the front of the chest. These two muscles function to return the hand to its original position after being stretched, and this activity increases blood flow to the small muscles in the breast, which causes vasodilation and facilitates blood flow, nutrients, and oxygen, which supports the formation of breast milk. The movement of the pectoralis major muscle helps to improve blood flow and stimulate the receptor ends of blood vessels. These stimuli are passed to the hypothalamus through the motor nerves, activating the anterior pituitary gland to release the hormone prolactin. This hormone plays a role in the production of breast milk. Therefore, the strength of the pectoralis major muscle can increase milk production, thus helping to fulfill the exclusive breast milk requirement.[21]

This study has several limitations that should be acknowledged. First, the literature review relies exclusively on secondary data from previous journal publications, making the findings dependent on the selected studies' quality, reliability, and methodologies. Any biases or limitations in those studies may affect the conclusions drawn in this review. Second, the selection of journals was limited to articles published within the last five years (2019–2024). This may exclude older yet potentially relevant studies that could provide a broader historical context or additional insights into the relationship between exclusive breastfeeding and stunting. Third, the search and selection process was conducted using only a limited set of keywords ("exclusive breastfeeding," "stunting," and "toddler"), which may have resulted in the exclusion of relevant articles that used different terminology. Moreover, the study did not incorporate a comprehensive search across a broader range of databases beyond those accessed, potentially leading to a narrower scope of data. Finally, limiting the review to six articles may not fully capture the diversity and complexity of factors influencing stunting in children under five. Future studies should expand the range of databases and keywords, include a longer publication timeframe, and explore primary data collection to provide a more holistic and robust understanding of the topic.

Conclusions

Child growth and development rely on adequate nutrition, with exclusive breastfeeding in the first six months crucial for meeting infants' nutritional needs and boosting immunity. It significantly reduces the risk of stunting, especially in low-income families. Studies show a strong link between exclusive breastfeeding and a lower risk of stunting, improving children's nutritional status and supporting national stunting reduction efforts. The pectoralis major muscle is key in stimulating prolactin production, enhancing milk production, and contributing to successful exclusive breastfeeding.

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Conflict of interest

This study has no conflicts of interest.

Author contributions

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NPAL designed the study, collected the data, and wrote the manuscript, while MNW and AAGESU gathered and revised the data.

Ethical consideration

This review study employed publicly available papers. As a result, this study required no informed consent or ethical consideration.

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