

LITERATURE REVIEW**LONG-TERM RISKS OF EARLY INITIATION OF BREASTFEEDING TO MOTHERS AND INFANTS IN ASIA: A SYSTEMATIC REVIEW**

Raisa Nurwany¹, Syifa Alkaf², Ajay Varmaa Jeyaseelan³

¹⁻²*Department of Obstetrics and Gynecology, Faculty of Medicine, Sriwijaya University, Palembang*

³*Medical Professional Study Program, Faculty of Medicine, Sriwijaya University, Palembang*

Correspondence: *Raissa Nurwany, Department of Obstetrics and Gynecology, Faculty of Medicine, Sriwijaya University, Palembang, Raissa.nurwany@fk.unsri.ac.id ; 081271308880*

Abstrak

Tujuan: Tinjauan sistematis ini bertujuan untuk mengetahui risiko jangka panjang dari inisiasi menyusui dini pada ibu dan bayi di Asia.

Metode: Metode yang digunakan dalam penulisan tinjauan pustaka ini adalah tinjauan sistematis dengan menggunakan kata kunci yaitu "Inisiasi Menyusui Dini", "Menyusui", "ASI", "Asia", "Risiko", "Bayi dan Ibu", "Panjang Jangka Risiko", dan "Manfaat". Pencarian literatur dilakukan dengan menggunakan database Google Scholar, Pubmed dan NCBI.

Hasil: Dari hasil penelusuran literatur berdasarkan kata kunci diperoleh 25 jurnal, dimana tujuh jurnal diantaranya memenuhi kriteria risiko jangka panjang IMD bagi ibu dan bayi di Asia. Satu penelitian pada penelitian ini menggunakan sistematik review, lima penelitian menggunakan studi kohort retrospektif, dan satu penelitian menggunakan studi cross sectional. Studi tersebut menemukan banyak risiko positif serta manfaat inisiasi menyusui dini bagi ibu dan bayi dalam jangka panjang di Asia.

Kesimpulan: Risiko positif pada bayi antara lain peningkatan imunitas, penurunan risiko kematian, dan pencegahan obesitas. Sedangkan risiko jangka panjang bagi ibu antara lain mempercepat involusi rahim, mencegah kanker payudara, serta menurunkan risiko diabetes dan pradiabetes pada ibu yang pernah mengalami diabetes gestasional.

Kata kunci: Menyusui; Asia; Bayi; Ibu; Risiko Jangka Panjang

Abstract

Objective: *This systematic review aims to determine the long-term risks of early initiation of breastfeeding in mothers and babies in Asia.*

Method: *The method used in writing this literature review is systematization using keywords, namely "Early Initiation of Breastfeeding", "Breastfeeding", "ASI", "Asia", "Risk", "Baby and Mother", "Long Term Risk", and "Benefits". A literature search was conducted using Google Scholar, Pubmed and NCBI databases.*

Results: *From the results of a literature search based on keywords, 25 journals were obtained, of which seven journals met the criteria for long-term risk of IMD for mothers and babies in Asia. One study in*

this study used a systematic review, five studies used a retrospective cohort study, and one study used a cross-sectional study. The study found many positive risks and benefits of early initiation of breastfeeding for mothers and babies in the long term in Asia.

Conclusion: *Positive risks for babies include increasing immunity, reducing the risk of death, and preventing obesity. Meanwhile, long-term risks for mothers include accelerating uterine involution, preventing breast cancer, and reducing the risk of diabetes and prediabetes in mothers who have experienced gestational diabetes.*

Keywords: *Early Initiation of Breastfeeding; Breastfeeding; Asia; Baby and Mother; Long Term Risk*

INTRODUCTION

The Maternal and Child Health (MCH) program is an effort in the health sector that concerns the service and well being of pregnant women, maternity mothers, breastfeeding mothers, infants and toddlers and preschool children. One of the efforts of the MCH is to reduce infant mortality. According to the Central Statistics Agency (BPS) report, Indonesia has an infant mortality rate of 16.85 per 1,000 live births in 2022. Thus, for every 1,000 babies born safely, about 16 of them die before reaching the age of 1 year. This infant mortality rate does not stand alone, but is related to other factors, especially nutrition. The nutritional status of mothers at the time of delivery and the nutrition of the infant itself act as indirect and direct factors in infant mortality. Based on data from the Ministry of Health in 2019, infant and toddler mortality rates in Indonesia are increasing. Every 6 minutes a newborn baby in Indonesia dies. The high infant and toddler mortality rate can be reduced by initiating early breastfeeding and providing exclusive breastfeeding.¹ Low fulfillment of nutrition, one of which is from breast milk, is a risk of infant morbidity and mortality. Therefore, the fulfillment of infant nutritional deserves serious attention. The most wholesome and cheapest nutrition for infants is exclusive breast milk.²

Early Breastfeeding Initiation (IMD) prevalence in Indonesia has not quite achieved the desired level. In Indonesia, 50% IMD coverage was the goal for 2019. In the country, West Papua Province (3.06%) has the lowest frequency of IMDs while Southeast Sulawesi Province (94.92%) has the greatest prevalence of IMDs. The IMD coverage objective for Indonesia in 2020 was 54%; however, two provinces, West Papua and Maluku Provinces, have not reached the designated targets. IMD coverage is 77.6% nationwide, with DKI Jakarta Province having the greatest frequency (96.1%) and Maluku Province having the lowest (52.1%).¹ The World Health Organization (WHO) and UNICEF (The United Nations Children's Fund) advocate exclusive breastfeeding as a way to lower the death rate. The best way to feed a baby is to breastfeed exclusively for the first six months of life, and then to continue breastfeeding for at least two years while adding appropriate complementary foods.³

Based on the explanation and several previous research results above, researchers want to study further by conducting a systematic review of long-term risks of early breastfeeding initiation for mothers and babies in Asia. This systematic review aims to knowing the long risk of early initiation of breastfeeding for mothers and babies in Asia.

METHODS

This literature review was written using a systematic review methodology, with the keywords "early breastfeeding initiating," "breastfeeding," "ASI," "Asia," "risk," "baby and mother," "long-term risk," and "benefits" being used. Using the databases from NCBI, Pubmed, and Google Scholar, a literature search was conducted. Levels 1, 2, and 3 evidence-based medicine research journals are the inclusion criteria for this literature search. Publications must have been released within the last ten years, or at least in 2013. Journals published in languages other than English and Indonesian are excluded according to this criterion.

Based on the findings of the literature search, the inclusion and exclusion criteria are evaluated by first analyzing the abstract and title of the work. If a relationship or correlation between the keywords and the journal's full text is found, this information is reviewed in order to support the creation of descriptions or analyses of the literature. this evaluation. Seven journals that satisfied the long-term risk criteria for early breastfeeding initiation for mothers and babies in Asia were discovered from the literature search results. The analytical approach that is employed is a systematic literature review, which is an approach that locates, examines, assesses, and methodically expands upon prior research with a focus on particular pertinent and appropriate topics. The article selection flow diagram is shown in **Chart 1**.

RESULTS AND DISCUSSION

There is a wealth of evidence linking early breastfeeding initiation (IMD) to benefits for both mother and child. IMD plays an important role in a baby's early development and growth, especially in the first 1000 days of life. In addition, IMD also has a significant impact on maternal health by increasing maternal satisfaction. Based on the search results, seven journals were found that fit the research objectives regarding the long-term risks of early breastfeeding initiation for mothers and infants in Asia. These studies used one cross-sectional study, five retrospective cohort studies, and one systematic review study. These studies that fit the research objective have been summarized into **Table 1**.

Early Initiation of Breastfeeding (IMD) is the process of a newborn breastfeeding from the mother within the first hour of birth. IMD is performed right after delivery with a limit of one hour after delivery. The process of performing IMD is done by placing the newborn baby on his or her stomach after drying his or her body, ensuring that the baby gets skin contact with his or her mother, and the baby finds his or her own mother's nipple (not thrust into the nipple) and ensures that the baby gets colostrum or breast milk that first comes out. So, IMD is a series of activities where as soon as the baby is born and the umbilical cord has been cut, the baby instinctively performs activities that end with finding the mother's nipple and then breastfeeding within the first hour of birth. There are many known benefits of early breastfeeding initiation such as improving immune health, reducing the risk of neonatal mortality, preventing obesity, accelerating uterine involution, preventing breast cancer, and preventing diabetes and prediabetes in mothers who already have gestational diabetes. In this study, seven journals were found to support the benefits as well as the long-term risks of early initiation of breastfeeding in children.

A study conducted by Indu et al.¹⁴ strongly supports that early initiation of breastfeeding can improve infant immunity. Growth factors are one of the important bioactive components found in breast milk. A particularly important factor for preterm infants is epidermal growth factor and transforming growth factors alpha and beta. These specific growth factors promote the functional development of the gastrointestinal mucosa beginning at birth and when partnered with the anti-inflammatory IL-10, they allow the immune system to tolerate antigens from exposure to specific nutrients and microbiota found in the gut. In addition, these growth factors participate in the immune system to decrease the inflammatory response and promote the repair of damaged gut cells. The healing aspect of growth factors is particularly important for preterm infants who may suffer from intestinal injuries including Necrotizing Enterocolitis (NEC).¹⁴

Babies who receive exclusive breast milk reap many benefits compared to formula milk, especially as the main nutritional intake at the beginning of life. This certainly provides good benefits for children to avoid allergies that can be caused by formula milk in the long term. Breast milk contains nutrients with composition, quantity, digestibility and absorption that are good for babies compared to cow's milk which is the main composition of formula milk. Breast milk also contains higher levels of carbohydrates (especially lactose and oligosaccharides). In their study, it was also found that early initiation of breastfeeding could be a negative risk due to the transmission of diseases that can be transmitted through breast milk, such as hepatitis B, measles, HIV, Zika virus, hepatitis C, human T cell leukemia virus, and malaria. However, breast milk should not be delayed for too long because it is very important for the baby, including its role in improving the immune system.¹⁵

There are many bioactive components of breast milk that contribute to the overall immunological activity of breast milk including antibodies, non-specific anti-infective agents, probiotics, white blood cells, inhibitors of microbiological activity, probiotic bacteria, prebiotic factors, and human cells such as leukocytes and lymphocytes. These components of breast milk provide protective mechanisms against infection, especially in the first few months and during breastfeeding. Many studies and epidemiological reviews have confirmed the protective role of breastfeeding against infections. Therefore, although children may contract infectious diseases through breast milk, the protective properties of breast milk may reduce the risk of disease manifestation. Breast milk has antibodies directed against many pathogens that the mother has been in contact with throughout life.¹³ These antibodies make up the majority of the protein content of secretions in the first days of breastfeeding. The concentration of antibodies decreases during lactation however, the amount of immunoglobulins received by the child remains unchanged due to increased milk intake although all immunoglobulin isotypes are found in colostrum and milk.¹⁶

Secretory IgA (SIgA) is considered the most important, both in relation to its concentration and biological properties. SIgA antibodies in breast milk are essential in mucous membrane defense. These antibodies effectively prevent the entry of microorganisms into tissues, are anti-inflammatory and do not consume energy during the reaction. IgM antibodies are the second most abundant immunoglobulin in human colostrum, with concentrations up to 2.5 mg/mL. High avidity IgM antibodies that are reactive with viruses and bacteria may play an important role in protecting the infant's mucosal surfaces. IgG is found at low concentrations in human milk, around 0.1 mg/mL (10% of serum values) and in addition to neutralizing activity, has opsonizing activity that can activate the complement system and antibody-dependent cytotoxicity, which is not expected to be strongly present on the infant's mucosal surfaces. Since many antibodies are given by the mother to the child through breast milk, breast milk can be protective for the child from diseases found in the community.¹⁶

A study by Park et al.⁸ found that early initiation of breastfeeding was also associated with benefits in preventing infant obesity. Early breastfeeding is known to reduce the risk of childhood obesity. However, the definitive breastfeeding mechanism that protects infants from overweight and obesity is still unknown. The different endocrine responses of formula-fed infants may promote increased body fat accumulation. Breast milk provides sufficient energy and nutrients, and is considered the ideal food for infants under six months. Infant formula has a higher protein/nitrogen content compared to breast milk and may cause metabolic responses such as increased insulin and insulin like growth factor-1 secretion in formula-fed infants, leading to excessive weight gain. In addition, breast milk contains hormones such as leptin, adiponectin and ghrelin that may affect appetite in the long term. Breastfed babies also gain less weight than formula-fed babies early in life, lowering the risk

of obesity in childhood and adulthood. Infant formula can result in more rapid weight gain and increased adiposity, along with other adverse cardio-metabolic effects.¹⁷

A study by Deepika et al.⁹ found that women who did not breastfeed their infants within 1 hour of birth had almost three times the likelihood of neonatal death compared to infants with early initiation of breastfeeding. Early initiation of breastfeeding has also been known to reduce the risk of neonatal mortality. This is due to adequate nutrition and improved immune system as a positive impact of early breastfeeding initiation. Early breastfeeding initiation is also associated with a lower risk of neonatal mortality. First breast milk (colostrum) contains bioactive immune factors that protect neonates from various infections and allergic diseases. Breast milk has also been known to prevent allergic rhinitis in children. Not only rhinitis, but it can also prevent or reduce the risk of other allergic diseases, such as asthma. This is attributed to the fact that breast milk does not contain allergenic proteins and therefore does not cause atopy in infants to various allergenic proteins in early life. This allows the infant's immune system to adapt to allergenic proteins over time so that atopy does not occur even if the protein enters the body.¹⁸

Early breastfeeding initiation is also very beneficial to mothers in preventing breast cancer, diabetes and prediabetes due to gestational diabetes, and accelerating uterine involution. This is in line with several studies conducted by Sumali et al.¹³, Mustapha et al.^{10,13}, and Widi et al.¹² IMD is one of the factors that support the process of uterine involution. Breastfeeding immediately after the baby is born has a contracting effect on uterine smooth muscle. Prolactin is responsible for initiating milk production, but delivery of milk to the infant and maintenance of lactation depends on mechanical stimulation of the nipple. Touch and suction of the mother's breast promotes the release of oxytocin, which causes contractions in the uterus, aiding the expulsion of the placenta and preventing bleeding. Oxytocin also stimulates other hormones that cause the mother to feel safe and comfortable, so that milk can be released smoothly. The physiological effect of oxytocin is to stimulate uterine smooth muscle contractions both during labor and the postpartum period so that it will accelerate the process of uterine involution. Besides, oxytocin also has an effect on the mother's breast, which increases the release of breast milk from the mammary gland.¹² Breast milk is also known to contain antibodies and immune substances that can help strengthen the baby's immune system.

IMD is very beneficial in preventing breast cancer in mothers. During breastfeeding, the production and release of estrogen hormones that can trigger the growth of breast cancer cells are lowered. Prolactin and oxytocin, the hormones involved in breastfeeding, have a protective effect on the development of breast cancer. In addition, the process of lactation (milk production and secretion) leads to the development of breast cells that are different from cancer cells. The cells that produce breast milk tend to be more differentiated (mature)

and have a low probability of transforming into cancer cells. In addition, during breastfeeding many women experience a delay in menstruation (amenorrhea) due to the high prolactin hormone in the body. This temporary cessation of menstruation can reduce the number of menstrual cycles in a woman's life. A decrease in the number of menstrual cycles is associated with a decreased risk of breast cancer as exposure to estrogen during the menstrual cycle has been linked to an increased risk of breast cancer.¹⁰

IMD is closely linked to the prevention of diabetes in mothers who already have gestational diabetes. Breastfeeding can help mothers to reduce the weight gained during pregnancy. Weight loss can help reduce the risk of type 2 diabetes in mothers. Studies show that breastfeeding can improve the body's sensitivity to insulin, a hormone that regulates blood sugar. Good insulin sensitivity can help prevent or overcome insulin resistance, which is characteristic of type 2 diabetes. Breastfeeding can also affect the body's metabolism, including the way the body processes sugar and fat. Several studies have shown that mothers who breastfeed have a lower risk of developing type 2 diabetes later in life.¹³

A study by Sunartiningsih et al.¹¹ found that most toddlers who were breastfed did not experience stunting (95.7%) in the study sample. The incidence of stunting in toddlers is related to nutrient intake in toddlers. The intake of nutrients consumed by toddlers daily depends on the mother so that the mother has an important role in regulating nutrients in toddlers. A mother with a high level of education and socioeconomics is likely to have the awareness and knowledge to provide food according to the nutrients needed by toddlers so that toddlers do not experience a lack of food intake. IMD affects the incidence of stunting because with IMD the baby will get breast milk for the first time which contains high colostrum rich with antibodies and substances important for intestinal growth and defense against infection. This is needed by infants for healthy survival. Infants who have IMD are less susceptible to infection and therefore less likely to fall ill.¹¹

CONCLUSION

Early initiation of breastfeeding (IMD) is the process of a baby breastfeeding immediately after birth, where the baby is left to find the mother's nipple on their own (not thrust into the nipple). Early initiation of breastfeeding will greatly help in the sustainability of exclusive breastfeeding (breast milk only) and the duration of breastfeeding. Thus, babies will have their needs met until the age of 2 years, and prevent malnutrition. In this study, there were many positive risks across studies regarding the long-term risks of early initiation of breastfeeding to mothers and infants in Asia. Positive risks to infants include improved immune health, reduced risk of neonatal mortality, and prevention of obesity. Meanwhile, the long-term risks to mothers include accelerating uterine involution, preventing breast

cancer, and preventing diabetes and prediabetes in mothers who already have gestational diabetes.

There is no conflict of interest in the scientific articles written.

Thanks are expressed to dr. Raissa Nurwany, Sp. OG and dr. Syifa Alkaf, Sp. OG as supervisor and correspondent in writing this journal, as well as supporting friends and team

There is no conflict of interest in the scientific articles written.

REFERENCES

1. Getachew, D, et al. 2022. Magnitude and determinants of knowledge towards pregnancy danger signs among pregnant women attending antenatal care at Chiro town health institutions, Ethiopia. Original Research Article.
2. Yunura I, NR PH, Ernita L. The Effect of Early Breastfeeding Initiation (Imd) on the Body Temperature of Newborn Babies at PMB Hj Hendriwati, s.st in 2022. Ners Journal. 2023 Apr 18;7(1):599–604.
3. Central Bureau of Statistics. Infant Mortality Rate in Indonesia. <https://data.tempo.co/data/1616/angka-kematian-bayi-indonesia-menurun>. 2022.
4. WHO. Breastfeeding. https://www.who.int/health-topics/breastfeeding#tab=tab_1. 2023.
5. Yohmi E, Marzuki NS, Nainggolan E, Ayu G, Partiwi N, Syarif BH, et al. Prevalence of exclusive breastfeeding in Indonesia: a qualitative and quantitative study. Vol. 55, Paediatrica Indonesiana Original Article VOLUME. 2016.
6. Gayatri M, Dasvarma GL. Predictors of early initiation of breastfeeding in Indonesia: A population-based cross-sectional survey. PLoS One. 2020 Sep 24;15(9):e0239446.
7. M. Kalarikkal S, L. Pflighaar J. Breastfeeding.
8. Sharma IK, Byrne A. Early initiation of breastfeeding: a systematic literature review of factors and barriers in South Asia. Int Breastfeed J. 2016 Dec 18;11(1):17.
9. Park SJ, Lee HJ. Exclusive breastfeeding and partial breastfeeding reduce the risk of overweight in childhood: A nationwide longitudinal study in Korea. Obes Res Clin Pract. 2018 Mar;12(2):222–8.
10. Phukan D, Ranjan M, Dwivedi LK. Impact of timing of breastfeeding initiation on neonatal mortality in India. Int Breastfeed J. 2018 Dec 3;13(1):27.
11. Abubakar M, Sung H, BCR D, Guida J, Tang TS, Pfeiffer RM, et al. Breast cancer risk factors, survival and recurrence, and tumor molecular subtype: analysis of 3012 women from an indigenous Asian population. Breast Cancer Research. 2018 Dec 18;20(1):114.
12. Sunartiningsih. The Relationship between Early Breastfeeding Initiation and the Incidence of Stunting in Toddlers 12-24 Months of Age. Indonesian Journal of Obstetrigynecology. 2020;1.
13. Ahmaniyah A, Andrian WM. The Relationship of Early Breastfeeding Initiation to Uterine Involution in Postpartum Mothers. Journal of Midwifery. 2021 Sep 17;11(2):56–62.
14. Hewage SS, Koh XYH, Soh SE, Pang WW, Fok D, Cai S, et al. Breastfeeding Duration and Development of Dysglycemia in Women Who Had Gestational Diabetes Mellitus: Evidence from the GUSTO Cohort Study. Nutrients. 2021 Jan 28;13(2):408.



15. Sharma P, Yadav S. Demographics, tumor characteristics, treatment, and survival of patients with Klatskin tumors. *Ann Gastroenterol* [Internet]. 2018 Mar 5 [cited 2023 May 27];31(2):231. Available from: [/pmc/articles/PMC5825954/](#)
16. Lee MK, Binns C. Breastfeeding and the Risk of Infant Illness in Asia: A Review. *Int J Environ Res Public Health*. 2019 Dec 26;17(1):186.
17. Camacho-Morales A, Caba M, García-Juárez M, Caba-Flores MD, Viveros-Contreras R, Martínez-Valenzuela C. Breastfeeding Contributes to Physiological Immune Programming in the Newborn. *Front Pediatr*. 2021 Oct 21;9.
18. Ong YY, Pang WW, Michael N, Aris IM, Sadananthan SA, Tint MT, et al. Timing of introduction of complementary foods, breastfeeding, and child cardiometabolic risk: a prospective multiethnic Asian cohort study. *Am J Clin Nutr*. 2023 Jan;117(1):83–92.
19. Hoang MP, Samuthpongton J, Seresirikachorn K, Snidvongs K. Prolonged breastfeeding and protective effects against the development of allergic rhinitis: A systematic review and meta-analysis. *Rhinology*. 2022;60(2):82–91.