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The Effect of Exclusive Breastfeeding on the Risk of ARI in Under-Five Children: Literature Review

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ABSTRACT

Introduction: Acute Respiratory Infection (ARI) is a major health problem in under-five children which can cause death. Exclusive breastfeeding can prevent infections, one of which is ARI.

Objective: This study aims to examine the relationship between exclusive breastfeeding and the risk of ARI in under-five children.

Method: This research uses a literature review approach which measures the relationship between exclusive breastfeeding and the risk of ARI in under-five children. The data source uses secondary data in the form of articles obtained through two databases, namely Scopus and Springer Link.

Result: There are 5 articles that meet the requirements for research. Four out of five articles prove that exclusive breastfeeding reduces the risk of children under five getting ARI. The finding of a higher risk of ARI in the group of children under five who are not exclusively breastfed can be caused by a decrease in the immunity of children under five, seeing that breast milk is proven to fight infection. The content of sIgA and lactoferrin in breast milk and immunization can increase the immune system in children under five who suffer from ARI.

Conclusion: Breast milk has nutrients in it which are useful for preventing infectious diseases, such as ARI and pneumonia in children under five. Given the influence on the health of children under five, the findings of this study demonstrate the need for improvements in breastfeeding programs, with a particular emphasis on exclusive breastfeeding and ARI management. There is a need for widely accessible health workers, information, and services connected to care for moms.

Keywords: Acute Respiratory Infections; Exclusive Breastfeeding; Under-Five Children

INTRODUCTION

Recently, many people in Indonesia have been experiencing colds and coughs, especially children. This happens because of the impact of extreme weather which causes many children to experience Acute Respiratory Tract Infection (ARI). Children's developing immune systems make them more susceptible to infection (1). ARI is an infection that causes difficulty in breathing normally. There are two forms of ARI based on the site of infection, namely upper respiratory tract infection and lower respiratory tract infection. ARI is one of the most common diseases in childhood, it causes major health problems and death in children under five years old (2). In children under five years old, *Streptococcus pneumoniae* (otherwise known as pneumococcus), respiratory syncytial virus (RSV), influenza virus, and *Haemophilus influenzae* type B (Hib) are among the most common causes of ARI (3).

Based on data from The Global Health Observatory in 2021, globally under-five years old mortality rate reached 38.09 or 38 child deaths before reaching the age of five per 1,000 live births (4). Globally, this figure has not met the Sustainable Development Goals (SDGs) target 3.2, which is to reduce under-five mortality to 25 per 1,000 live births (5). According to the United Nations Inter-Agency Group for Child Mortality Estimation (UN IGME) the number of children who die before their fifth birthday is at a historic low, falling to 4.9 million by 2022. But the findings also show that despite progress, there is still a long way to go to end all preventable child and adolescent deaths (6). Further efforts are still needed to minimize the mortality rate of children under-five due to ARI on a global scope.

The causes of children under-five years old death, one of which is the inability of mothers to provide enough breast milk (7). Research conducted by Yeo et al. states that breast milk is an important source of protection against infection, inflammation, allergies, and long-term metabolic disorders for breastfed children. Breast milk is the liquid secreted by the mother's breast glands (8). In order for babies to get enough nutrition, WHO recommends giving exclusive breast milk to babies up to six months without adding or replacing with other sources of nutritional intake, except for medicines and vitamins (9). An infant who is not exclusively breastfed may have a significantly higher chance of dying from pneumonia or diarrhea than one who is. Additionally, breastfeeding strengthens infants' immune system and may shield them against long-term health issues like diabetes and obesity. However, despite all the possible advantages, only 48% of newborns aged 0 to 5 months globally receive breast milk exclusively (10).

In several studies, the incidence of ARI in children under five has various risk factors, such as breastfeeding for less than six months, birth weight, lack of vitamin A supplementation, sleeping with three to five people in one room, using wood as a fuel source, exposure to cigarette smoke, and exclusive breastfeeding (11,12). The high incidence of ARI and the uneven distribution of exclusive breastfeeding are problems that need further attention. Therefore, this study aims to look at the effect of exclusive breastfeeding to the risk of ARI in children under five.

METHOD

This study used a literature review design, articles were obtained from two databases, namely Scopus and Springer Link. The keywords used in the search were "exclusive breastfeeding" AND "acute respiratory infection" OR "acute lower respiratory tract infection" OR "acute upper respiratory tract infection" AND "under-five children". The flow chart of the literature systematics can be seen in Figure 1.

The inclusion criteria used were: 1) Studies that measure the relationship between exclusive breastfeeding and ARI incidence; 2) Sample of children aged less than equal five years; 3) Articles within the time span of 2019-2024; 4) Open access free full text; 5) Observational research; and 6) English language.

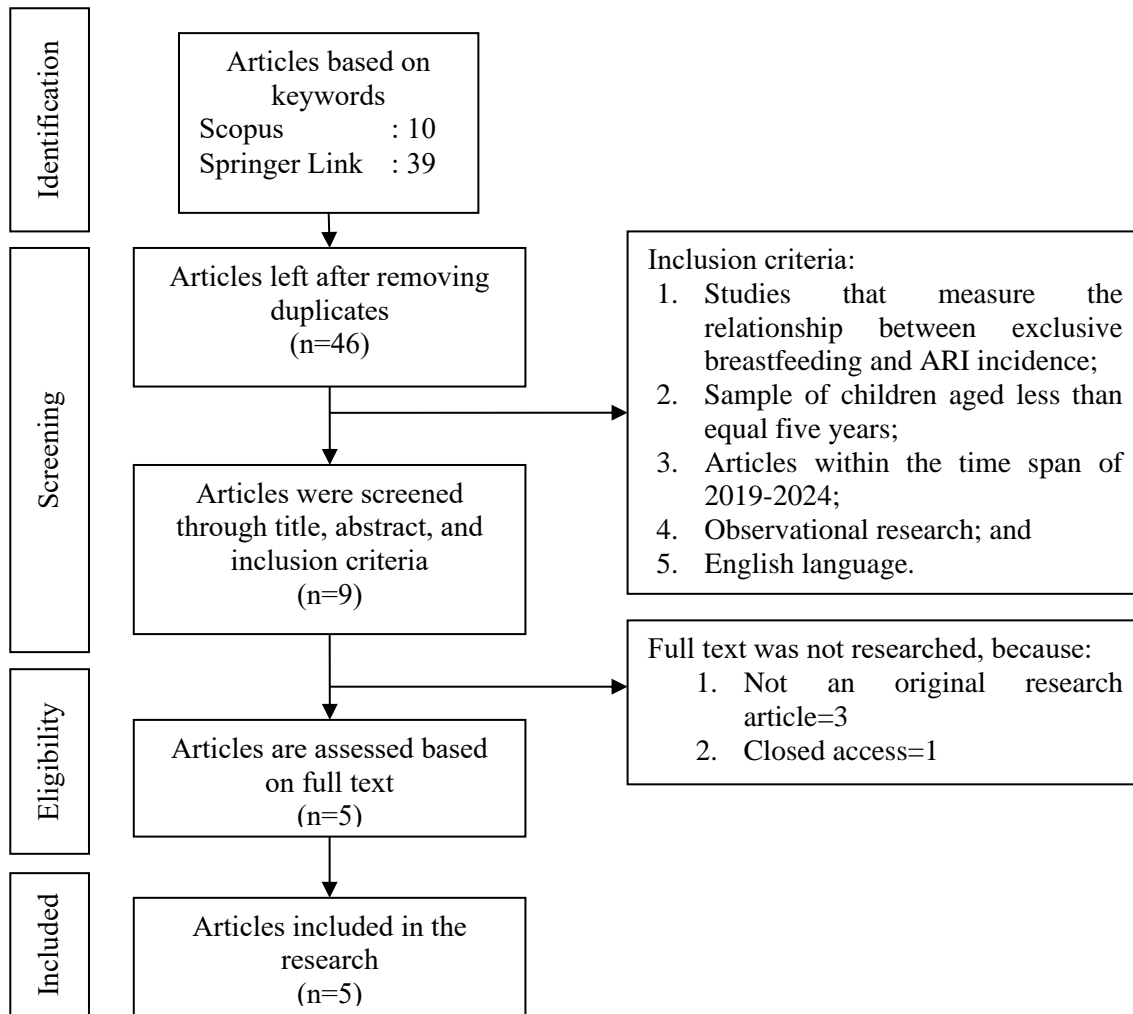


Figure 1. Flow Chart of Study Identification and Selection Process

RESULTS

The literature identified through Scopus and Springer Link totaled 49 articles. The remaining articles after removing duplicates were 46 articles. After the articles were filtered using the title, abstract, and inclusion criteria, the eligible articles became 9 articles. After filtering based on full text, there were 5 articles that were assessed for eligibility. Once eligible, 5 articles were included in the literature review. The final journals collected through the screening and assessment stage of 5 articles will be extracted into the information presented in Table 1.

Table 1. Results of Literature Review articles

No.	Title, Author, Year	Sample	Method	Result
1.	Analysis of Factors Influencing Acute Respiratory Infection among Under-Five Children in Sering Public Health Centre, Medan Tembung Subdistrict	35 childrens under-five	Cross-sectional	Exclusive breastfeeding had no significant association with the incidence of ARI (p=0.157).
2.	Determinants of pneumonia among under-five children in Oromia region, Ethiopia: unmatched case-control study	398 childrens aged 2 to 59 months (199 cases and 199 controls)	Case-control	Compared to children who were breastfed for 6 months, children who were breastfed for less than 6 months had a 3.5 times higher risk of developing pneumonia (AOR=3.51).

No.	Title, Author, Year	Sample	Method	Result
3.	Exclusive Breastfeeding and Upper Respiratory Infection in Infants Aged 6-12 Months in Kampar District, Riau Province	324 childrens aged 6 to12 months (162 cases and 162 controls)	Case-control	Children who were not exclusively breastfed were 1.69 times more likely to have upper respiratory tract infections than children who were exclusively breastfed (OR=1.69).
4.	Pneumonia remains a leading public health problem among under-five children in peri-urban areas of north-eastern Ethiopia	560 childrens under-five	Cross-sectional	Pneumonia can be prevented by exclusive breastfeeding for infants. Most of the children under five in the study were exclusively breastfed, with 481 children (89.2%).
5.	In-house environmental factors and childhood acute respiratory infections in under-five children: a hospital-based matched case-control study in Bangladesh	348 children aged 6 to 59 months (174 cases and 174 controls)	Case-control	Only 56.32% (196 out of 348 children) were exclusively breastfed. However, exclusively breastfed children were 50% (OR = 0.50) less likely to develop ARI than children who were not exclusively breastfed. In addition, exclusive breastfeeding significantly minimized ARI in children under five (AOR = 0.48).

DISCUSSION

Four of the five articles reviewed proved that exclusive breastfeeding reduces the risk of ARI in children under five. Two articles discussed pneumonia as a form of ARI that is commonly suffered by children under five. The articles also show that exclusive breastfeeding is one way to prevent pneumonia (11,13). Research conducted by Islam et al. in 2024 showed that not all children were exclusively breastfed, only 56.32% (196 out of 348 children) were exclusively breastfed (14).

The finding of a higher risk of ARI in the group of children under five who are not exclusively breastfed can be caused by a decrease in the immunity of children under five, seeing that breast milk is proven to fight infection (15). Breast milk tends to actively regulate the maturation of a newborn's immune system. The higher risk of ARI in children under five who are not exclusively breastfed could also be due to children not receiving the benefits of breast milk in preventing infectious diseases, such as diarrhea, which often contributes to a lack of nutrition and can lead to a compromised immune system (16).

The content of sIgA and lactoferrin in breast milk and immunization can increase the immune system in children under five who suffer from ARI (17). In addition, breast milk is the best source of nutrition and can increase immunity because it contains IgM, IgG, and lymphocytes that can fight infections including pneumonia in children under five (12). Therefore, the utilization of breast milk to prevent infections in children under five is needed, especially with exclusive breastfeeding.

Mothers are important in the growth and development of their children. Educating mothers about child health improves their health-seeking behavior and compliance with appropriate childcare practices, such as exclusive breastfeeding until 6 months of age, initiation of appropriate complementary feeding, and vaccination of children, which in turn reduces the risk of infection in children. Children under five born to mothers who are not exposed to health education media have a higher chance of developing ARI than children under five born to mothers who are exposed to health education media. Exposure to media increases the level of maternal knowledge such as pregnancy check-ups, delivery at health facilities, proper child feeding practices, and child vaccinations (18).

The results of this study prove that improvements in breastfeeding programs are needed, especially focusing on exclusive breastfeeding and ARI management, given the impact on the health of children under five. Handling ARI in children under five is not only curative, but must be preventive and promotive, which is done with cross-program and cross-sector cooperation. Cross-program implementation can be done in the pregnant women's class program, which in addition to inviting mothers to provide exclusive breastfeeding to children, also explains the benefits of breast milk to children. In addition, cross-sector cooperation can be done by involving political leaders, community leaders, and Family Empowerment and Welfare (PKK).

Lactation support to mothers can have long-lasting benefits. Family support is an important factor in the success of exclusive breastfeeding. A mother who has just given birth experiences a decrease in physical and psychological abilities. Mothers who receive support from their husbands are more likely to practice exclusive breastfeeding. Family support, especially husbands, is an external factor that has a major effect on mothers' confidence and motivation in breastfeeding (19). In addition, community support is also important in increasing exclusive breastfeeding. Counseling, training and education from health workers provide mothers with motivation to

breastfeed. Consistent messages and support from the government, surrounding community, health workers, and family will help mothers to implement recommended breastfeeding practices (20).

Exclusive breastfeeding not only reduces the occurrence of infectious diseases such as ARI, but can also provide many benefits to child development and growth. Exclusive breastfeeding also provides benefits to mothers to protect against the risk of developing ovarian and breast cancer and reduce obesity (21). Therefore, there is a need for information, health workers, and health services that are easily accessible to mothers related to breastfeeding.

CONCLUSION

Four of the five articles reviewed proved that children under five who were not exclusively breastfed were more at risk of ARI and pneumonia than those who were exclusively breastfed. Breast milk has nutritional components that are useful in preventing infectious diseases, such as ARI and pneumonia in children under five. Given the influence on the health of children under five, the findings of this study demonstrate the need for improvements in breastfeeding programs, with a particular emphasis on exclusive breastfeeding and ARI management. In addition to being curative, managing ARI in children under five needs to be preventive and promotional.

SUGGESTION

There is a need for widely accessible health workers, information, and services connected to care for moms. The results of this literature review can serve as a reference for the importance of exclusive breastfeeding in reducing under-five deaths due to ARI. Education to the family around the mother is also needed to support the mother in breastfeeding.

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