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Exclusive Breastfeeding as a Shield: Its Impact on Illness Incidence Among Infants Aged 6–12 Months at Kendalsari Health Center, Malang

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ABSTRACT

Background: Illness is a state in which the body physically, mentally, and socially experiences weakness, disability, and discomfort. Newborn babies are more susceptible to disease because the antibodies in their bodies are not yet fully formed. Breast milk is the first intake to help the formation of the immune system because breast milk contains antibodies and other protective substances.

Purpose: To determine the relationship between exclusive breastfeeding and the incidence of illness in infants aged 6-12 months at Kendalsari Health Center, Malang City.

Methods: This study used a case control design with a retrospective approach. The sampling technique used purposive sampling. The sample in this study consisted of a case group (sick babies) as many as 35 mothers & babies in the Kendalsari Community Health Center MTBS Clinic and a control group (healthy babies) as many as 35 mothers & babies in Jatimulyo Village in March-April 2024.

Results: The results of the Chi-square test value of exclusive breastfeeding with the incidence of illness obtained a significant p-value of 0.001 (<0.05).

Conclusion: Exclusive breastfeeding has a significant effect on the incidence of illness in infants aged 6-12 months. Thus, it is expected that mothers can provide exclusive breastfeeding for infants aged 0-6 months. Future research can examine other factors (maternal condition, maternal psychology, and environment) that can affect exclusive breastfeeding and the incidence of illness.

Keywords:
Babies, exclusive breastfeeding, incidence of illness, infants

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BACKGROUND

Illness is a condition in which the body physically, mentally, and socially experiences weakness, disability, and does not feel comfortable (Penugonda et al., 2022). Newborn babies will be more susceptible to disease because the antibodies in their bodies have not been formed perfectly, so babies need breast milk as an intake to help form the immune system. The immune system is a biological structure that acts as immunity or the body's defense system. The body's defense in question is a defense against antigens or external biology by recognizing and killing pathogens. Breast milk contains colostrum, colostrum is a substance containing protein and vitamin A with high concentrations that are needed by babies to meet their nutritional needs (Melo et al., 2021).

Breast milk contains immunoglobulin A, which is a component of the immune system and functions to trigger allergic reactions in the body (Hadi et al., 2021). In addition, breast milk has a complex mixture of nutrients, cells from the mother, immunomodulatory factors, and microbes that are beneficial to the health of the baby. These components directly strengthen immune cells by supporting tolerance responses through cytokines (TGF-beta and IL-10), lactoperoxidase, and fatty acids that affect cell differentiation and gene expression (Atyeo & Alter, 2021). The formation of IgA in breast milk starts from IgA plasma cells that collect in the mammary glands of lactating mothers. These CCR10+ IgA+ plasma cells are present in lymph nodes and peyer's patches in mucosal tissue and mammary glands (Amaral et al., 2015; Dewey, K.G., Cohen, R.J., Brown, K.H. & Rivera, 2001; Ratnasari et al., 2017; Tewabe et al., 2016). Expression of the mucosal chemokine CCL28, which is regulated by mammary gland epithelial cells during lactation, causes the previously formed mucosal plasma cells to take up residence in the mammary gland, allowing newly formed breast milk to fill (Desai et al., 2019; Melo et al., 2021).

Source of data from the Central Bureau of Statistics by East Java province in (2022) From 2020 to 2022. the percentage of infants under six months old who were exclusively breastfed went up to (69,72%) from (66,90%). This relates to the Republic of Indonesia No. 33 of 2012 government regulation's conclusions, which state that all newborns nourished by their mothers must receive only breast milk. The proportion of infants in Malang City who are exclusively breastfed fell from (88,1%) in 2020 to (79,2%) in 2022, which is not yet in line with the minimum national target of (80%) (Sara et al., 2023).

Babies who do not receive exclusive breastfeeding will suffer from inadequate nourishment, which will have an impact on their development and growth. An further consequence of not providing exclusive breastfeeding is affects the baby's immunity, where the baby will be more susceptible to diseases from viruses, bacteria, and other antigens, such as infections, allergies, diarrhea, diabetes, acute respiratory infections (ARI), and other diseases (Boakye-Yiadom et al., 2018).

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The results of the study titled "Effect of Exclusive Breastfeeding on the Incidence of Acute Respiratory Infection (ARI) in Infants 6-12 months of Age" by Hersoni Soni (2019) lend credence to the idea that breastfeeding is essential for the well-being and development of the child. Infants whose mothers do not exclusively breastfeed them have a higher risk of developing ARI, according to the study (Hendaus et al., 2018; Hulsbosch et al., 2023; Mohamed et al., 2018). Exclusively breastfed babies get the maximum nutritional benefits and have a lower risk of illness, allergies and infections because they get all the nutrients contained in breast milk. Thus, in order to determine whether there is a relationship between exclusive breastfeeding and the occurrence of sickness in infants aged 6 to 12 months, researchers are interested in doing study on this topic.

OBJECTIVE

This study aims to analyze the relationship between exclusive breastfeeding (ASI) and the incidence of illness in infants aged 0–6 months. Through this study, it is expected to determine the extent to which the practice of exclusive breastfeeding contributes to reducing the frequency of illnesses, such as acute respiratory infections (ARI), diarrhea, and fever in infants. The findings of this study are expected to be a scientific basis in supporting efforts to promote exclusive breastfeeding as a strategy for preventing illness in infants.

METHODS

The research design used by researchers is a quantitative method with a Case Control design. This research was conducted in March-April 2024 at Kendalsari Health Center, Malang City. The case population in this study consisted of 48 mothers and their infants who experienced illness and sought care at Kendalsari Health Center during the period of March–April 2024. The control population comprised 51 mothers and their healthy infants aged 6–12 months who attended the Integrated Service Post (Posyandu) in Jatimulyo during the same period. Participants were selected using purposive sampling based on the following inclusion criteria: (1) mothers with infants aged 6–12 months, (2) willingness to participate in the study, and (3) complete data availability. The research instrument was a structured questionnaire consisting of two main sections: (1) exclusive breastfeeding practices, assessed through 10 items with binary responses ("Yes" for exclusive breastfeeding and "No" for non-exclusive breastfeeding), and (2) infant morbidity, measured by 5 items concerning the frequency and type of illness experienced. Infant health status was categorized as follows: Healthy (no reported illness), Rarely Sick (reported illness 1–3 times), and Frequently Sick (reported illness more than 3 times) within the observation period.

Both univariate and bivariate data analysis were employed using Chi-Square which was used to determine the relationship between the independent variable (exclusive

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breastfeeding) and the dependent variable (incidence of illness). This research has been declared ethically feasible by the KEPK of the Health Polytechnic of the Ministry of Health Malang with serial number No. DP.04.03/F.XXI.31/0214/2024.

RESULTS

1. Univariate Analysis Result

Tabel 1 General Characteristic of Mothers in Kendalsari Health Center and Jatimulyo Village, 2024

No.	Characteristics	Case		Control		Total	
		n	%	n	%	n	%
1.	**Mother's age**						
	<20 years	2	5,7	0	0	2	2,9
	20-35 years	32	91,4	34	97,1	66	94,2
	>35 years old	1	2,9	1	2,9	2	2,9
Total		35	100	35	100	70	100
2.	**Parity**						
	Primiparous	17	48,6	26	74,3	43	61,4
	Multiparous	18	51,4	9	25,7	27	38,6
Total		35	100	35	100	70	100
3.	**Mother's Last Education**						
	Elementary school	1	2,9	0	0	1	1,4
	Junior high school	2	5,7	1	2,9	3	4,3
	High school	29	82,8	27	77,1	56	80
	Higher education	3	8,6	7	20	10	14,3
Total		35	100	35	100	70	100
4.	**Mother's Occupation**						
	Work	1	2,9	1	2,9	2	2,9
	Not working	34	97,1	34	97,1	68	97,1
Total		35	100	35	100	70	100

Table 1 shows that almost all mothers (94,2%) in the case group (91,4%) and control group (97,1%) were 20-35 years old. Maternal parity in this study was mostly multiparous (51,4%) in the case group, while in the control group (97,1%) it was multiparous. Most of the case group (74,3%) were primiparous. Almost all of the mothers (80%) in the case group (82,8%) and control group (77,1%) had a high school education. Maternal occupation was almost entirely (97,1%) in the case and control groups of mothers in this study did not work or as housewives.

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Tabel 2 Knowledge Characteristics of Mothers in Kendalsari Health Center and Jatimulyo Village, 2024

No.	Characteristics	Case		Control		Total	
		n	%	n	%	n	%
1.	**Exclusive breastfeeding knowledge**						
	Good	13	37,1	30	85,7	43	61,4
	Simply	1	2,9	4	11,4	5	7,2
	Less	21	60	1	2,9	22	31,4
Total		35	100	35	100	70	100
2.	**Exclusive breastfeeding information sources**						
	Social media	1	2,9	1	2,9	2	2,9
	Integrated Service Post	11	31,4	12	34,2	23	32,9
	Midwife	4	11,4	21	60	25	35,7
	Doctor	0	0	1	2,9	1	1,4
	None	19	54,3	0	0	19	27,1
Total		35	100	35	100	70	100

Table 2 shows that almost all mothers (85,7%) in the control group possessed thorough understanding of exclusive breastfeeding while in the case group most (60,0%) respondents had poor knowledge of exclusive breastfeeding. The source of information about exclusive breastfeeding knowledge in the case group was almost half (31,4%) of mothers getting information about exclusive breastfeeding from the integrated service post (posyandu) and most (60,0%) in the control group were mostly obtained from midwife.

Tabel 3 Characteristics of Infants in Kendalsari Health Center and Jatimulyo Village, 2024

No.	Characteristics	Case		Control		Total	
		n	%	n	%	n	%
1.	**Baby's Age**						
	6 Months	4	11,5	10	28,6	14	20
	7 Months	6	17,1	5	14,3	11	15,7
	8 Months	6	17,1	2	5,7	8	11,4

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No.	Characteristics	Case		Control		Total	
		n	%	n	%	n	%
	9 Months	2	5,7	6	17,1	8	11,4
	10 Months	7	20	10	28,6	17	24,3
	11 Months	7	20	2	5,7	9	12,9
	12 Months	3	8,6	0	0	3	4,3
Total		35	100	35	100	70	100
2.	**Gender**						
	Male	19	54,3	17	48,6	36	51,4
	Female	16	45,7	18	51,4	34	48,6
Total		35	100	35	100	70	100

Table 3 shows the characteristics of infants in the age category in the case group almost half (20,0%) were 10 months and 11 months old, while in the control group almost half (28,6%) were 6 months and 10 months old. The gender of infants inthe case group was mostly (54,3%) male, while in the control group most (51,4%) were female.

Tabel 4 Exclusive breastfeeding in Kendalsari Health Center and Jatimulyo Village, 2024

Exclusive breastfeeding	Case		Control		Total	
	n	%	n	%	n	%
Exclusive breastfeeding	4	11,4	33	94,3	37	52,9
Not exclusively breastfed	31	88,6	2	5,7	33	47,1
Total	35	100	35	100	70	100

Table 4 shows that exclusive breastfeeding in the case group almost entirely (88,6%) did not provide exclusive breastfeeding, while in the control group almost entirely (94,3%) provided exclusive breastfeeding.

Tabel 5 Incidence of Infant Illness in Kendalsari Health Center and Jatimulyo Village, 2024

Frequency of Illness	Case		Control		Total	
	n	%	n	%	n	%
Health (0 times)	0	0	0	0	0	0
Rarely sick (≤1-3 times)	16	45,7	31	88,6	47	67,1
Frequent illness (>3 times)	19	54,3	4	11,4	23	32,9

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Frequency of Illness	Case		Control		Total	
	n	%	n	%	n	%
Total	35	100	35	100	70	100

Table 5 shows the frequency of illness in infants aged 6-12 months in the case group, most (54,3%) experienced frequent illness (>3 times), while in the control group almost all (88,6%) experienced infrequent illness (≤1-3 times).

Tabel 6 Age at First Infant Illness in Kendalsari Health Center and Jatimulyo Village, 2024

Age of First Illness	Case		Control		Total	
	n	%	n	%	n	%
≤6 months	34	97,1	30	85,7	64	91,4
>6 months	1	2,9	5	14,3	6	8,6
Total	35	100	35	100	70	100

Table 6 shows that the age at which infants first became ill in the case group was almost entirely (97,1%) when they were ≤6 months old, similar to the control group (85,7%).

Tabel 7 Frequent illnesses of infants aged 6-12 months in Kendalsari Health Center and Jatimulyo Village, 2024

Frequent illnesses	Case		Control		Total	
	n	%	n	%	n	%
Common cold	31	88,6	33	94,3	64	91,4
Fever	3	8,5	0	0	3	4,3
Diarrhea	1	2,9	2	5,7	3	4,3
Total	35	100	35	100	70	100

Table 7 shows that the most common illnesses suffered by infants aged 6-12 months in the case group were common cold, similar to the control group (94,3%).

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2. Bivariate Analysis Result

Tabel 8 Association between exclusive breastfeeding and the incidence of illness in infants aged 6-12 months in Kendalsari Health Center and Jatimulyo Village, 2024

Variables	Incidence of Illness				Total		*p-value*	*OR*
	Rarely sick		Frequent illness					
	n	%	n	%	n	%		
Breastfeeding								
Exclusive breastfeeding	34	72,3	3	13,0	37	52,9	0,001	17,432
Not exclusively breastfed	13	27,7	20	87,0	33	47,1		
Total	47	100	23	100	70	100		

Table 8 shows the outcome of exclusive breastfeeding variables given the prevelance of illness in the table, it can be seen that infants who aren't fed breast milk alone will be sick more often (87%) compared to babies who are exclusively breastfed (13%). According to statistical tests, there is a significant relationship between exclusive breastfeeding and the incidence of illness. The results of the variable analysis using Chi-square with SPSS for mac version 29.0 on xx^2 (1) = 21.791, p- 0.001, value = 0.001, V = 558, Odds Ratio (OR) 17.432 CI 4.424- 68.720 so p<0.05. The outcome of the odds ratio analysis showed that the group that was not exclusively breastfed had a risk of 17.432 times the incidence of illness compared to the group that was exclusively breastfed. This relationship means that H0 being rejected and Ha being accepted, indicating a strong correlation between exclusive breastfeeding and the incidence of illness in infants aged 6-12 months at the Kendalsari Health Center in Malang City.

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DISCUSSION

1. Exclusive Breastfeeding

Age, parity, education level, and access to information on exclusive breastfeeding are some of the elements that affect a woman's decision to exclusively breastfeed. A person's attitude and behavior when making decisions related to exclusive breastfeeding is also influenced by the mother's age. Mothers in their twenties and thirties were more likely to exclusively breastfeed (54,5%). Mothers between the ages of 20 and 35 are more likely to exclusively breastfeed because this is a period of greater emotional maturity, stable hormones, and good reproduction (Elyas et al., 2017; Hunegnaw et al., 2017). Supported by the research findings of Efriani & Astuti (2020)that mothers between the ages of 20 and 25 are more likely to breastfeed exclusively, while mothers under the age of 20 or over the age of 35 are less likely to do so.

Another factor that affects exclusive breastfeeding is parity. Most of the mothers in this study (61,4%) were primiparous. Primiparous mothers may experience problems when breastfeeding such as notknowing how to breastfeed, hesitation in breastfeeding, and lack of experience in breastfeeding, but many primiparous mothers seek information about breastfeeding and exclusive breastfeeding so that they apply it to their first child, while multiparous mothers will have more experience in exclusive breastfeeding and breastfeeding their previous children, This makes multiparous mothers confident in breastfeeding and already have knowledge in breastfeeding, but there are still some multiparous mothers who do not provide exclusive breastfeeding to their babies because they are too busy taking care of their first child, breast milk is not smooth, and feel that their first child is still healthy even though they are not given exclusive breastfeeding. Inthe study of Mohamed et al., (2018) showed that the exclusive breastfeeding rate in Moms who were primiparous and multiparous were comparable, so it did not show a relationship between parity and exclusive breastfeeding. The respondent's education level also determines attitudes and behavior in making decisions about exclusive breastfeeding. The better a person's level of education, the better the mindset that is formed, the existence of this mindset will make a person more open to new things and able to receive information well. This will affect the formation of better knowledge, attitudes, and behavior (Janmohamed et al., 2020). This is in line with the research of (Sari, 2016)with the results of the relationship between the level of education and the success rate of mothers in providing exclusive breastfeeding, this can occur because the mother's level of education regarding exclusive breastfeeding can influence the mother in providing exclusive breastfeeding to her baby.

Maternal knowledge about exclusive breastfeeding is also very important in the continuity of exclusive breastfeeding because if the mother misinterprets exclusive

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breastfeeding, exclusive breastfeeding can be wrong and inappropriate. Some mothers interpret exclusive breastfeeding as breastfeeding for 2 years or breastfeeding for 6 months, this statement is an inaccurate statement because breastfeeding exclusively for six months without receiving any other assistance food or drink, so it is very important for mothers to understand the significance of exclusive breastfeeding. Learn what exclusive breastfeeding entails by consulting the appropriate sources of information. According to research by (Hadi et al., 2021; Nobari et al., 2021), there is a tendency for mothers' knowledge of exclusive breastfeeding to be good with exclusive breastfeeding so that moms' awareness of exclusive breastfeeding and exclusive breastfeeding are significantly correlated.

Sources of information help mothers to get accurate details about exclusive care. The right source of information about exclusive breastfeeding is found in midwives, doctors, health workers, and cadres during integrated service post (posyandu). Mothers who get information from health workers tend to provide exclusive breastfeeding as much as 30-35%. In this study there were still some mothers who did not get information about exclusive breastfeeding because mothers did not routinely attend integrated service post (posyandu) and lack of maternal interest in finding out about exclusive breastfeeding. Sources of information provide a more focused standard to better achieve the goals and objectives that have been set based on the information obtained. Information will also increase insight and knowledge, which will ultimately affect the lives of information users. According to (Putri & Puspowati, 2019) research mothers who get many sources of information related to exclusive breastfeeding will increase their knowledge about exclusive breastfeeding, the benefits of breast milk and the goodness of breast milkfor baby health, so that the mother's knowledge increases and forms confidence so that the mother will give her baby exclusive breastfeeding.

Compared to working mothers, mothers who are not employed have more time to devote to exclusive care. Most non-working mothers (52,9%) provide exclusive breastfeeding. According to (Sulasmi et al., 2021) there is a tendencyfor working mothers not to provide exclusive breastfeeding due to the lack of opportunity to provide exclusive breastfeeding. While working moms have more time to devote to exclusive breastfeeding, some working mothers nonetheless choose not to engage in this practice because they do a lot of household activities themselves without any help from their husbands, such as cleaning the house and caring for children. In (Purnamasari & Mufdlilah, 2018) stated that there is a relationship between maternal employment and exclusive breastfeeding, where mothers who do not work will have a greater chance of providing exclusive breastfeeding.

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2. Incidence of Illness

In the case group, more infants experienced more than three times the frequency of illness (frequent illness) compared to the control group. Infants who were not exclusively breastfed were more likely to experience more than three illnesses. This study shows that exclusively breastfed infants are more protected from illness than those who are not exclusively breastfed. This is due to the active protective substances in breast milk that help form the baby's immunity. According to research by (Sari, 2016) there is a difference in the frequency of disease in infants who are exclusively breastfed compared to those who are not. Infants who are exclusively breastfed tend to have a lower frequency of illness (less than once a month) than infants who are not exclusively breastfed.

The age at which the infant first became ill also indicates the effectiveness of breastfeeding against disease exposure. In this study, the age at which the infants first became ill was almost entirely (91,4%) at ≤6 months of age. In the case group more. Many babies experienced illness at the age of ≤6 months compared to the control group. Babies experience illness for the first time at the age of ≤6 months because their immunity is still weak and not yet fully formed, but babies who are given exclusive breastfeeding will be stronger because they get antibody intake from the breast milk given. The incidence of illness can also be influenced by several other factors such as environmental factors, family, genetics, conditions in the womb and other factors (Tewabe et al., 2016).

Infants have weak immunity, making them susceptible to disease. The baby's immune system is formed when the baby is 6 months old and above, the mother's Ig G antibody that is passed on to the child has decreased a lot, at this time the child's immune system is not complete. The baby's body will produce antibodies completely at the age of 3-4 years. Diseases that usually affect infants usually include infectious diseases, perinatal disorders, and malnutrition problems. Babies need fast and proper treatment when experiencing symptoms of disease because their immune system is still weak.

3. The Relationship between Exclusive Breastfeeding and the Incidence of Illness

This study shows that infants under 6 months old still have a weak body and are vulnerable to disease, so that through exclusive care, they can strengthen their immune system with antibodies. This study supports the findings, who found a correlation between infants' 0–12 month illness frequency and exclusive breastfeeding, although the strength of the relationship is relatively weak. This is due to the antibody content in breast milk which helps protect babies from various diseases. Research by (Penugonda et al., 2022) reinforces this assertion, demonstrating a significant association between exclusive breastfeeding and a reduced incidence of illness in infants during the first six months of

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life. In a prospective cohort study involving 450 term infants, the researchers found that only 32% of exclusively breastfed (EBF) infants experienced illness, compared to 49% of non-EBF infants. The mean number of illnesses per infant was significantly lower in the EBF group (0.45) than in the non-EBF group (0.60), with respiratory infections (82.6%) being the most common, followed by gastrointestinal infections (11.6%).

Research by Hadi et al., (2021) further supports this evidence by highlighting the protective role of exclusive breastfeeding against stunting and recurrent infections in young children from low-income households in Eastern Indonesia. Based on a cross-sectional study involving 408 children aged 6–24 months, the authors found that exclusively breastfed children were significantly less likely to be stunted, particularly among those from economically disadvantaged families. Specifically, children from poor households who received exclusive breastfeeding were 20% less likely to experience stunting, while children from wealthier households who were exclusively breastfed had a 50% lower risk of stunting compared to their non-exclusively breastfed peers. Although the study focused on stunting, the authors emphasized that recurrent infections often a precursor to growth faltering were less frequent among exclusively breastfed children, thereby underscoring the dual protective effect of exclusive breastfeeding on both infection and nutritional outcomes.

CONCLUSION

At the Kendalsari Health Center in Malang City, there is a noteworthy correlation between the frequency of illness in infants between the ages of 6 and 12 months with exclusive breastfeeding with odd ratio shows that the group with no exclusive breastfeeding has a risk of 12.692 times experiencing illness compared to the group that is given exclusive breastfeeding.

Suggestions for midwives are expected to ensure exclusive breastfeeding during postpartum visits by looking at the physical condition of the mother and baby nutrition and teaching mothers how to breastfeed properly so that exclusive breastfeeding can be fulfilled. For future researchers, it is necessary to study the relationship between other factors related to exclusive breastfeeding and the incidence of illness such as the psychological state of the mother, the physical stateof the mother and baby, family support, socio-culture, nutritional status, using acohort approach and random sampling techniques.

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