

Infant Feeding, Lower Respiratory Infection and Child Physical Growth: Comparative Study

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Abstract

Background: Breast milk contains factors such as lymphocytes, neutrophils, cytokines, and antibodies that actively promote and activate the infant's immune system while also facilitating growth, immunity, and the proper immune response.

Aims: To compare between types of feeding during infancy in relation to lower respiratory infection, and physical growth during first year.

Method : This study was conducted through a convenience sampling on (50) hospitalized child with lower chest infection.

Results: There is about 74% of children with lower respiratory infection take artificial feeding and about 90.3% of them infected with pneumonia and fifth 20% of sample's BMI with in 85th percentile. The result show that a significant differences between type of feeding in relation to lower respiratory infection, while there is no significant differences between type of feeding in relation to physical growth..

Conclusion: Children who take breast feeding have less incidence of lower respiratory infection in relation to those who take artificial feeding (bottle feeding) as they having a large incidence of lower respiratory infection , and there is a significance differences between them. In addition, the large percentage of those who take bottle feeding with in normal range of MBI percentile and there is no significance differences between groups in relation to physical growth.

Recommendations: There is a need to increase and development of educational training courses, seminars and workshop that held by governmental and non-governmental agencies about the important of breast feeding during the first 6 months of life.

Keyword: type of feeding, infancy, physical growth, lower respiratory infection

Introduction

The World Health Organization (WHO) advises that babies be breastfed completely before they reach the age of six months, and then supplemented with breast milk for up to two years or longer.([Frank et al., 2019](#)).

Breastfeeding is definitely a significant public health concern because it offers important immunity from diseases in newborns and children. Breast feeding has been used to safeguard from infections so effectively in developed countries that it is estimated that increasing breast feeding by 40percent globally would decrease respiratory infection deaths by 50percent in children under the age of two years. In the developed world, breast feeding is associated with reduced rates of morbidity and mortality. ([Rubin et al., 2019](#)).

Breast milk contains factors such as lymphocytes, neutrophils, cytokines, and antibodies that actively promote and activate the infant's immune system while also facilitating growth, immunity, and the proper immune response.([Fisk et al., 2011](#)).

Infections of the respiratory tract are a leading cause of morbidity in infants. In the first year of childhood, research in developed countries indicate a prevalence of respiratory tract infections ranging from 3.4 to 32.1 percent. In children under the age of five, respiratory tract infections are a frequent cause of hospitalization. Breastfeeding has been shown to safeguard children living in developed countries from respiratory infections on several instances. Most research find that breastfeeding protects against respiratory infections over time, as effects are mostly assessed at six months , or even at 1, 2, or six years, suggesting that the preventive effect continues even after breastfeeding is discontinued. ([Pandolfi et al., 2019](#)).

Formula-fed infants are more likely than breastfed infants to gain excess or rapid weight, and this increased risk in formula-fed infant populations could be due to a variety of mechanisms. Excess or rapid weight gain within the first two years of life is linked to a higher risk of childhood and adult overweight and obesity later in life. The nutritional content of the formula, as well as the way it is prepared and given to babies, are examples of these processes. There are several possible best practice formula feeding tips that can minimize excess or rapid weight gain, such as using reduced protein formula, not adding cereals to bottle, not placing a baby to bed with a bottle, and not over feeding formula. ([Appleton et al., 2018](#)).

Despite the reported short- and long-term health benefits of breastfeeding, only 37percent of children under the age of six months are breastfed in low- and middle-income countries, and much less regularly or for a shorter period of time in high-income countries. ([Zaqout et al., 2016](#)).

2. Methodology

2.1 Ethical considerations

Permission has been obtained from Babylon health directorate.

Design ,setting, sampling of study and data collection

A Descriptive-comparative study which conducted to compare between types of feeding during infancy in relation to lower respiratory infection, and physical growth during first year. The study Initiated from (3rd November , 2020 –10th February, 2021). The study carried out in the Babylon province, held on 50 hospitalized children infected with lower respiratory infection selected by convenience sampling from two hospital randomly by convenience sampling in order to collecting data by using a modified tool.

Instrument of study

The researchers were developing a questionnaire that consist of demographical data, head circumference, chest circumference height, weight, type of feeding during infancy, types of antibiotics.

Statistical Analysis

The data analysis of this study is analyzed through using the Statistical Package of Social Sciences (SPSS) version (24). The following statistical data analysis approaches were used in order to analyze data and assess the results of the study. The researchers used descriptive and inferential data analysis to obtain results.

3. Result and discussion

Table 1:Distribution of the Study Sample by their demographic data (N =50)

Demographical data	Ranking And Intervals	Frequency	Percentage %
Age/ month	1-3	18	35.5
	4-6	15	29.0
	7-9	6	12.9
	10-12	11	22.6
	Total	50	100
Gender	Male	26	52
	Female	24	48
	Total	50	100
Mother's age / year	17-22	23	45.2
	23-27	16	32.3
	28-32	11	22.6
	Total	50	100
Occupation	Employee	2	3.2
	Housewife	48	96.8
	Total	50	100
Income monthly	Poor	23	46

	Moderate	21	42
	Good	6	12
	Total	50	100
Type of feeding	Breast feeding	3	6
	Bottle feeding	37	74
	Mix feeding	10	20
	Total	50	100

Table 1 showed that most of sample 35.5 % were between (1-3) month, this result disagree with the study conducted in Southampton by (Fisk et al., 2011), which indicate that most child age were > 6month and agree with the same study result regarding child gender which indicate that most 53 %study sample were male. Regarding mother's age, higher percentage 45.2% were between (17-22), this result disagree with study that carried out in Bangladesh by (Mihirshahi et al., 2018), to study the Association between infant feeding patterns and diarrhea and respiratory illness

Table 1 revealed that 74% of child were bottle feeding, this result disagree with the study conducted in Copenhagen by (Munir et al., 2016), which show that higher percentage 70% of child in second month were breast feeding.

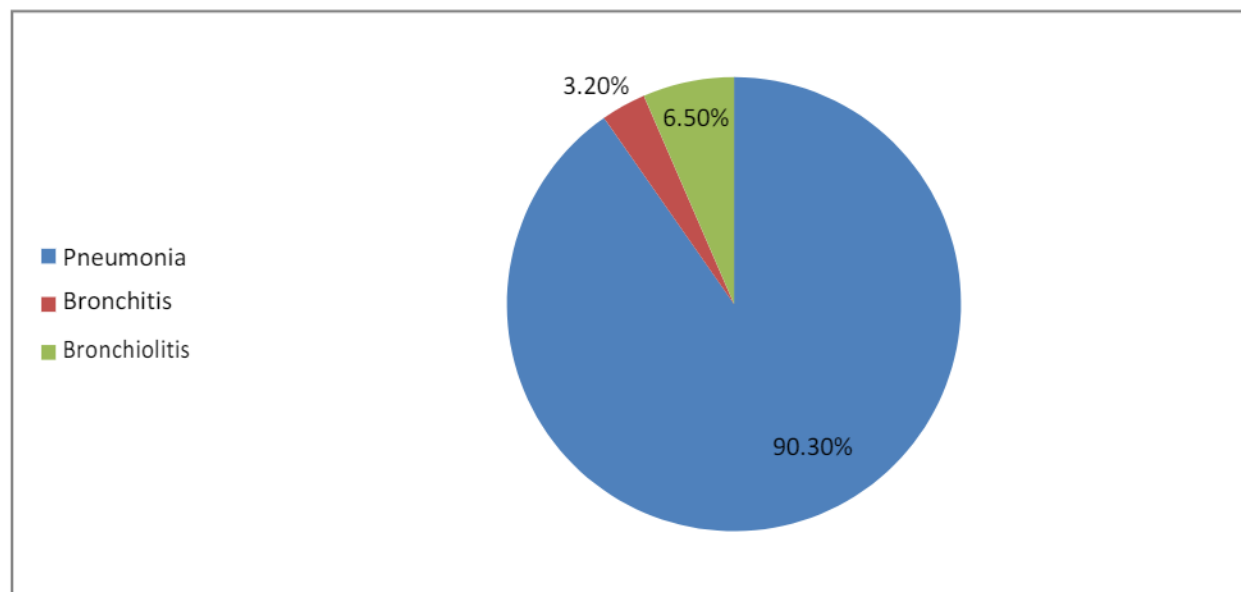


Figure1. medical diagnosis of sample

Figure.1 show that 90.3% of hospitalized child were diagnosed with pneumonia, this due to the severity of this disease and the need for hospitalization.

Table 2. Distribution of sample’s physical growth

Physical growth measurements	Ranking And Intervals	Frequency	Percentage %
MBI percentile	less than 3rd percentile	9	18
	3rd percentile	3	6
	15th percentile	8	16
	50th percentile	9	18
	85th percentile	10	20
	97th percentile	5	10
	More than 97th percentile	6	12
	Total	50	100
Head circumference percentile	Under normal height	13	25.8
	2-10 percentile	14	29
	25-75 percentile	21	41.9
	Over normal	2	3.2
	Total	50	100
Chest circumference	Under normal	11	22.6
	Normal	32	64.5
	Over normal	7	12.9
	Total	50	100

Table 2 explore that one fifth of child MBI percentile were 85th percentile, this result agree with the study conducted in United States between May 2005 and June 2007 by (Ruowei Li et al., 2014), to study (Risk of Bottle-feeding for Rapid Weight Gain During the First Year of Life) which revealed that 45.97 % with in normal BMI.

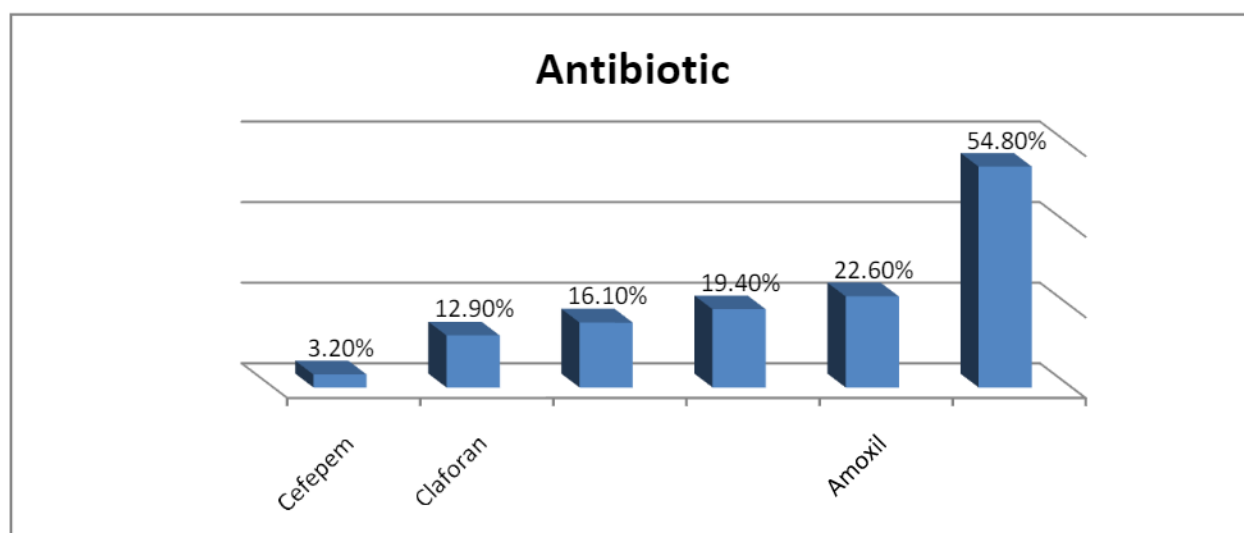


Figure 2. distribution of Anti biotic that administrated to child with lower respiratory infection.

Figure.2 showed that 54.8% of antibiotic that used in the treatment of lower respiratory infection was ceftriaxone, this due to the wide spread of antimicrobial coverage of this drug.

Table 3. differences between type of feeding in relation to lower respiratory infection(N=50).

Type of feeding	Diagnosis			p-value*
	Pneumonia	Bronchitis	Bronchiolitis	
Breast feeding	7.1%	0%	0%	0.042
Bottle feeding	71.4%	100%	100%	
Mix feeding	21.4%	0%	0%	
Total	100%	100%	100%	

*ANOVA

Table 4 show that more than two 71.4% of hospitalized children with pneumonia were bottle feeding, while all children who infected with bronchitis and bronchiolitis take artificial feeding (bottle feeding) and there is a significant differences between type of feeding in relation to lower respiratory infection at p-value ≤ 0.05 .

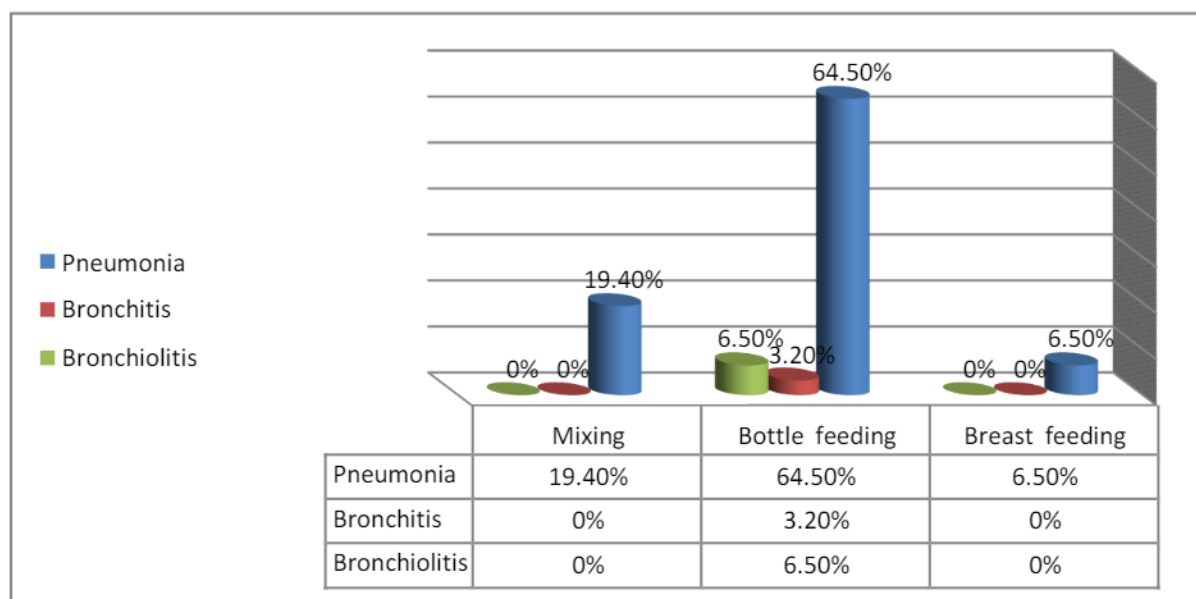


Figure3. Distribution of type of feeding in relation to lower respiratory infection.

Figure 3 show that two third 65.5% of children with bottle feeding infected with pneumonia and just 6.5% of children with breast feeding infected with pneumonia, this due to weak immunity of children who take artificial feeding compared with breast feeding, and this result agree with the study that carried out in Bangladesh by (Mihreshahi et al., 2018) to study (Association between infant feeding patterns and diarrhoeal and respiratory illness) which find that about 75% of non-exclusively breastfed children infected with acute respiratory infection.

Table 4. differences between type of feeding in relation to physical growth(N=50).

MBI percentile	Type of feeding			p-value*
	Breast feeding	Bottle feeding	Mix feeding	
Less than 3rd percentile	0%	24.4%	0%	0.627
3 rd - 97th percentile	100%	58.6%	100%	
More than 97th percentile	0%	16.2%	0%	
Total	100%	100%	100%	

*ANOVA
 Table 5 explore that all children who take breast feeding mix feeding with in normal weight (3rd-97th percentile) and more than fifth of children who take bottle feeding with in normal weight, related to significancy, there is no differences between type of feeding in relation to physical growth, this result agree with the result of study that carried out by (Zasada et al., 2019) under title of (Does type of feeding affect body composition in very low birth weight infants) which state that no difference in body weight or length between any of the three studied groups.

4. Conclusion

The researchers conclude that children who take breast feeding have less incidence of lower respiratory infection in relation to those who take artificial feeding (bottle feeding) as they having a large incidence of lower respiratory infection , and there is a significance differences between them. In addition, the large percentage of those who take bottle feeding with in normal range of MBI percentile and there is no significance differences between groups in relation to physical growth.

5- Recommendations:

According to the conclusion of the current study, the researchers recommended the following

- 1- The results of the study point toward the important of breast feeding during the first 6 months of life, so there is a need to increase and development of educational training courses, seminars and workshop that held by governmental and non-governmental agencies.
- 2- Due to the lack in such researches in Iraq, further studies will be required to improve breast feeding through the infancy period.

6- References

1. Appleton, J., Russell, C. G., Laws, R., Fowler, C., & Wilson, E. D. (2018). *Infant formula feeding practices associated with rapid weight gain : A systematic review. February*, 1–14. <https://doi.org/10.1111/mcn.12602>
2. Fisk, C. M., Crozier, S. R., Inskip, H. M., Godfrey, K. M., Cooper, C., Roberts, G. C., & Robinson, S. M. (2011). *Original Article Breastfeeding and reported morbidity during infancy: findings from the Southampton Women ' s Survey*. 61–70. <https://doi.org/10.1111/j.1740-8709.2010.00241.x>
3. Frank, N. M., Lynch, K. F., Uusitalo, U., Yang, J., Lönnrot, M., Virtanen, S. M., Hyöty, H., Norris, J. M., & Study, T. (2019). *The relationship between breastfeeding and*

- reported respiratory and gastrointestinal infection rates in young children.* 1–12.
4. Mihrshahi, S., Oddy, W. H., Peat, J. K., & Kabir, I. (2018). Association between infant feeding patterns and diarrhoeal and respiratory illness : A cohort study in Chittagong , Bangladesh. *International Breastfeeding Journal*, 3(28). <https://doi.org/10.1186/1746-4358-3-28>
 5. Munir, K. M., Lavelle, T. A., Helm, D. T., Thompson, D., Prestt, J., & Azeem, M. W. (2016). *AUTISMA GLOBAL FRAMEWORK*.
 6. Pandolfi, E., Gesualdo, F., Rizzo, C., Carloni, E., Villani, A., Concato, C., Linardos, G., Russo, L., Ferretti, B., Campagna, I., & Tozzi, A. (2019). *Breastfeeding and Respiratory Infections in the First 6 Months of Life: A Case Control Study*. 7(April), 1–7. <https://doi.org/10.3389/fped.2019.00152>
 7. Rubin, H., Leventhal, M., Jekel, F., & Krasilnikoff, A. (2019). Relationship Between Infant Feeding and Infectious Illness : A Prospective Study of Infants During the First Year of Life. *Pediatrics*, 85, 464–471.
 8. Ruowei Li, M., Dee, D., Li, C.-M., Hoffman, H. J., & Grummer-Strawn, L. (2014). Breastfeeding and Risk of Infections at 6 Years. *Pediatrics*, 134(1), 13–20. <https://doi.org/10.1542/peds.2014-0646D>
 9. Zaqout, M., Michels, N., Ahrens, W., Börnhorst, C., Molnár, D., Moreno, L. A., Eiben, G., & Siani, A. (2016). Associations between exclusive breastfeeding and physical fitness during childhood. *European Journal of Nutrition*. <https://doi.org/10.1007/s00394-016-1337-3>
 10. Zasada, M., Kwinta, P., & Mo, N. (2019). *ScienceDirect Does type of feeding affect body composition in very low birth weight infants? e A prospective cohort study*. <https://doi.org/10.1016/j.pedneo.2018.04.010>