ISSN: 2457-0400

Impact Factor: 7.675

WORLD JOURNAL OF ADVANCE HEALTHCARE RESEARCH

www.wjahr.com

Volume: 10, Issue: 6

Page N. 73-78

Year: 2026

Original Article

Coden USA: WJAMA3

ASSESSMENT OF BREASTFEEDING PRACTICES AND THEIR ASSOCIATION WITH COMMON CHILDHOOD ILLNESSES AMONG CHILDREN UNDER TWO YEARS

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Article Received: 28 April 2026 **Article Revised:** 18 May 2026 **Article Published:** 01 June 2026

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DOI: https://doi.org/10.5281/zenodo.20443651

How to cite this Article: *[1]Dr. Lara Samuel Oshana, [2]Dr. Mohammad Hilal Al-Badrany (2026). Assessment Of Breastfeeding Practices And Their Association With Common Childhood Illnesses Among Children Under Two Years. World Journal of Advance Healthcare Research, 10(6), 073–078.

ABSTRACT

Background: Breastfeeding is an essential infant feeding practice that provides optimal nutrition and immunological protection during early life. Suboptimal breastfeeding practices may increase the risk of common childhood illnesses, particularly diarrhea and respiratory tract infections. **Objectives:** To assess breastfeeding practices and determine their association with common childhood illnesses among children under two years attending primary health care centers and hospital pediatric consultation clinic. **Methods:** A cross-sectional study was conducted among 250 children under two years attending Baghdada Primary Health Care Centers and the Pediatric Consultation Clinic at Mosul General Hospital, Nineveh Governorate, Iraq, from August 2024 to November 2025. Data were collected from mothers or caregivers using a structured questionnaire covering breastfeeding practices and common childhood illnesses. Data were analyzed using SPSS version 31, and associations were tested by Chi-square test. A p-value <0.05 was considered statistically significant. **Results:** Early initiation of breastfeeding was reported in 44.8% of infants, while exclusive breastfeeding during the first six months was reported in 41.6%. Continued breastfeeding at the time of data collection was found in 63.2% of children. Fever was the most commonly reported illness (50.4%), followed by acute respiratory tract infection (44.8%) and diarrhea (37.6%). Non-exclusively breastfed children had significantly higher rates of diarrhea (45.9% vs. 26.0%, p = 0.002), acute respiratory tract infection (53.4% vs. 32.7%, p = 0.001), fever episodes (58.2% vs. 39.4%, p = 0.004), and hospital admission (19.9% vs. 8.7%, p = 0.018) compared with exclusively breastfed children. **Conclusions:** Exclusive breastfeeding was associated with lower occurrence of common childhood illnesses among children under two years. Strengthening breastfeeding counseling during antenatal, delivery, and postnatal care is recommended to improve breastfeeding practices and reduce preventable childhood morbidity.

KEYWORDS: Breastfeeding; Childhood illnesses; Diarrhea; Exclusive breastfeeding; Infants.

1-INTRODUCTION

Breastfeeding is a fundamental component of infant and young child nutrition and is one of the most effective public health interventions for improving child survival, growth, and development. The first two years of life represent a critical period during which feeding practices influence nutritional status, immune maturation, susceptibility to infection, and long-term health outcomes. The World Health Organization and UNICEF recommend early initiation of breastfeeding within the first hour after birth, exclusive breastfeeding for the first six months of life, and continued breastfeeding with safe and nutritionally adequate complementary feeding up to two years of age or beyond.[1-2]

Breast milk is uniquely adapted to the nutritional and immunological needs of infants. It provides appropriate amounts of macronutrients and micronutrients and contains bioactive components such as secretory immunoglobulin A, lactoferrin, lysozyme, human milk oligosaccharides, cytokines, growth factors, and living immune cells. These components support maturation of the intestinal mucosa, promote healthy gut microbiota, and enhance mucosal immunity. Through these

mechanisms, breastfeeding contributes to protection against common infectious diseases during infancy and early childhood, particularly diarrheal diseases and respiratory tract infections.[3-4]

Common childhood illnesses, especially diarrhea, fever, and acute respiratory infections, remain major causes of morbidity among children under five years of age. Infants and young children are particularly vulnerable because of immature immune function, exposure to contaminated food or water, and inadequate feeding practices. Exclusive breastfeeding reduces exposure to contaminated fluids and foods and provides passive immune protection, thereby lowering the risk and severity of gastrointestinal and respiratory infections. Recent evidence has shown that non-exclusive breastfeeding is associated with increased risk of diarrhea, acute respiratory infections, and fever among infants and young children.[5-6]

Diarrheal disease remains an important global public health problem and is among the leading causes of illness and death in young children. The protective effect of breastfeeding against diarrhea is well documented. A recent rapid review and meta-analysis reported that exclusive breastfeeding was associated with a 43% reduction in diarrhea risk among infants aged 0–6 months. Similarly, recent global burden evidence showed that non-exclusive breastfeeding contributes substantially to childhood diarrheal disease burden, particularly among infants younger than six months.[7-8]

Respiratory tract infections are also among the most frequent causes of outpatient visits and hospital admissions during infancy and early childhood. Breastfeeding may reduce the risk and severity of respiratory infections through passive transfer of maternal antibodies and immunomodulatory factors that strengthen mucosal defense. A recent review of breastfeeding and infant health outcomes reported that greater breastfeeding exposure was associated with reduced risk of moderate-to-severe respiratory and gastrointestinal infections among infants and children.[9]

Despite the well-established benefits of breastfeeding, suboptimal breastfeeding practices remain common worldwide. Global data indicate that approximately 48% of infants under six months were exclusively breastfed in 2023–2024, which remains below the updated global target of 60% by 2030. Breastfeeding practices are influenced by maternal education, employment status, mode of delivery, antenatal counseling, postnatal support, cultural beliefs, early introduction of formula or water, and family influence. These factors may affect breastfeeding initiation, exclusivity, and duration, thereby influencing childhood morbidity patterns.[10-11]

In Iraq, breastfeeding practices may be affected by socioeconomic conditions, maternal knowledge, healthcare access, family support, and cultural feeding practices. Limited local data are available regarding breastfeeding practices and their relationship with common childhood illnesses among children under two years. Therefore, this study aims to assess breastfeeding practices and their association with common childhood illnesses among children under two years attending primary health care centers and hospitals.

2-PATIENTS AND METHODS

A cross-sectional design was adopted to conduct this study among children below two years of age attending Baghdada Primary Health Care Centers and the Pediatric Consultation Clinic at Mosul General Hospital in Nineveh Governorate, Iraq. The study was carried out over the period from August 2024 to November 2025. Its main purpose was to assess breastfeeding practices and examine their relationship with common illnesses during early childhood.

Prior to data collection, official permission was obtained from the Directorate of Health in Nineveh Governorate. Mothers or caregivers were informed about the objectives of the study, and verbal consent was obtained before inclusion. Participation was voluntary, and all collected data were treated confidentially.

The study included children under the age of two years who visited the selected health facilities during the study period. Children with congenital abnormalities, chronic systemic diseases, severe malnutrition, or any medical condition that could influence feeding behavior or increase susceptibility to recurrent infections were excluded.

Participants were enrolled using a convenient sampling technique. Data were collected by direct interview with mothers or caregivers using a structured questionnaire. The questionnaire was designed to obtain information about the child's demographic characteristics and maternal factors, including age and sex of the child, maternal age, educational level, occupation, parity, mode of delivery, and place of delivery.

Information related to breastfeeding was collected in detail. This included initiation of breastfeeding after delivery, exclusive breastfeeding during the first six months, duration and continuation of breastfeeding, use of formula milk, mixed feeding, age at introduction of complementary feeding, and reported causes of early discontinuation or interruption of breastfeeding. Exclusive breastfeeding was defined as feeding the infant only breast milk during the first six months of life, without giving water, formula milk, or other foods, except prescribed medicines, oral rehydration solution, vitamins, or mineral supplements.

Common childhood illnesses were evaluated based on maternal or caregiver reports. The assessed illnesses included diarrhea, fever, acute respiratory tract infections, and hospital admission. Diarrhea was defined

as the passage of three or more loose or watery stools per day. Acute respiratory tract infection was identified by a history of cough, nasal discharge, difficulty in breathing, or a diagnosis made by a physician.

The collected data were reviewed, coded, and entered into SPSS version 31 for statistical analysis. Descriptive statistics were used to present the data as frequencies and percentages for categorical variables, while means and standard deviations were used for continuous variables. The Chi-square test was applied to determine the association between breastfeeding practices and common childhood illnesses. Statistical significance was considered at a p-value below 0.05.

3-RESULTS

A total of 250 infants and young children under two years of age were included in the study. The age of participants ranged from birth to 24 months, with a mean age of 11.4 ± 6.2 months.

Table 1 shows the demographic characteristics of the studied children. The highest proportion of participants was aged 6–11 months (34.4%), followed by those aged less than 6 months (28.8%), while children aged 18–24 months represented the lowest proportion (14.0%). Males were slightly more frequent than females, accounting for (52.8%) and (47.2%), respectively, with a male-to-female ratio of 1.1:1. Most children were from urban areas (65.6%).

Table 1: Demographic characteristics of the studied children (n = 250).

Variable	Category	Number	Percentage
Age group	<6 months	72	28.8%
	6–11 months	86	34.4%
	12–17 months	57	22.8%
	18–24 months	35	14.0%
Gender	Male	132	52.8%
	Female	118	47.2%
	Male : Female ratio	1.1 : 1	
Residence	Urban	164	65.6%
	Rural	86	34.4%

Table 2 presents breastfeeding practices among the studied children. Early initiation of breastfeeding within the first hour after birth was reported in 112 (44.8%) infants, while 138 (55.2%) did not start breastfeeding early. Exclusive breastfeeding during the first six months was reported in 104 (41.6%) children, whereas 146 (58.4%) were not exclusively breastfed. Continued breastfeeding at the time of data collection was reported in 158 (63.2%) children. Regarding feeding type, 104 (41.6%) children were exclusively breastfed, 98 (39.2%) received mixed feeding, and 48 (19.2%) were formula-fed only. Complementary feeding was introduced at six months in 121 (48.4%) children, before six months in 79 (31.6%), and after six months in 50 (20.0%).

Table 2: Breastfeeding practices among the studied children (n = 250).

Breastfeeding Practice	Category	Number	Percentage
Early initiation of breastfeeding	Yes	112	44.8%
	No	138	55.2%
Exclusive breastfeeding during first 6 months	Yes	104	41.6%
	No	146	58.4%
Current breastfeeding status	Continued breastfeeding	158	63.2%
	Stopped breastfeeding	92	36.8%
Type of feeding	Exclusive breastfeeding	104	41.6%
	Mixed feeding	98	39.2%
	Formula feeding only	48	19.2%
Complementary feeding introduction	At 6 months	121	48.4%
	Before 6 months	79	31.6%
	After 6 months	50	20.0%

Table 3 shows the distribution of common childhood illnesses among the studied children. Fever episodes were the most frequently reported illness, affecting 126 (50.4%) children, followed by acute respiratory tract infection in 112 (44.8%) children and diarrhea in 94 (37.6%) children. Hospital admission due to illness was reported in 38 (15.2%) children.

Table 3: Distribution of common childhood illnesses among the studied children (n = 250).

Childhood Illness	Number	Percentage
Fever episodes	126	50.4%
Acute respiratory tract infection	112	44.8%
Diarrhea	94	37.6%
Hospital admission due to illness	38	15.2%

Table 4 demonstrates the association between exclusive breastfeeding and common childhood illnesses. Diarrhea was significantly more frequent among children who were not exclusively breastfed compared with exclusively breastfed children (45.9% versus 26.0%, p = 0.002). Acute respiratory tract infection was also more common among non-exclusively breastfed children (53.4%) compared with exclusively breastfed children (32.7%), with a statistically significant association (p = 0.001). Fever episodes and hospital admission were also significantly higher among children who were not exclusively breastfed (p = 0.004 and p = 0.018, respectively).

Table 4: Association between exclusive breastfeeding and common childhood illnesses (n = 250).

Childhood Illness	Exclusively Breastfed n = 104	Not Exclusively Breastfed n = 146	P-value
Diarrhea	27 (26.0%)	67 (45.9%)	**0.002**
Acute respiratory tract infection	34 (32.7%)	78 (53.4%)	**0.001**
Fever episodes	41 (39.4%)	85 (58.2%)	**0.004**
Hospital admission due to illness	9 (8.7%)	29 (19.9%)	**0.018**

Table 5 shows the association between type of feeding and common childhood illnesses. The frequency of diarrhea, acute respiratory tract infection, fever episodes, and hospital admission was lowest among exclusively breastfed children and highest among formula-fed children. The association between type of feeding and all studied childhood illnesses was statistically significant (p < 0.05).

Table 5: Association between type of feeding and common childhood illnesses (n = 250).

Childhood Illness	Exclusive Breastfeeding n = 104	Mixed Feeding n = 98	Formula Feeding Only n = 48	P-value
Diarrhea	27 (26.0%)	42 (42.9%)	25 (52.1%)	**0.003**
Acute respiratory tract infection	34 (32.7%)	49 (50.0%)	29 (60.4%)	**0.002**
Fever episodes	41 (39.4%)	55 (56.1%)	30 (62.5%)	**0.007**
Hospital admission due to illness	9 (8.7%)	18 (18.4%)	11 (22.9%)	**0.041**

4- DISCUSSION

Breastfeeding is a major determinant of infant health during the first two years of life because it provides both nutritional support and immunological protection. In the present study, exclusive breastfeeding during the first six months was reported in 41.6% of children, while 58.4% were not exclusively breastfed. This rate is slightly below the recent global estimate, as the World Health Organization reported that nearly half of infants under six months were exclusively breastfed in 2024. The relatively lower rate in the current study may be related to maternal employment, inadequate breastfeeding counseling, early introduction of formula milk, cultural beliefs, maternal perception of insufficient milk, and limited postnatal support. Similar determinants were reported in recent studies evaluating exclusive breastfeeding practices in different populations.[10-11]

Early initiation of breastfeeding within the first hour after birth was reported in 44.8% of infants in the present study. Early initiation is an important practice because it supports neonatal thermoregulation, enhances maternal–infant bonding, stimulates breast milk production, and allows the infant to receive colostrum, which is rich in immunoglobulins and bioactive protective factors. The finding that more than half of infants did not initiate breastfeeding early indicates a gap in immediate postnatal breastfeeding support. This may be influenced by cesarean delivery, maternal exhaustion, delayed mother–infant contact, lack of counseling in delivery units, and routine use of prelacteal feeds. Recent evidence emphasizes that breastfeeding promotion requires not only maternal education but also health-system support during antenatal, delivery, and postnatal care.[10, 12]

The present study showed that fever was the most commonly reported childhood illness, affecting 50.4% of children, followed by acute respiratory tract infection in 44.8% and diarrhea in 37.6%. These findings are clinically important because respiratory and gastrointestinal infections are among the most frequent causes of outpatient visits, medication use, and hospital attendance during infancy and early childhood. The high frequency of these illnesses may reflect the vulnerability of children under two years due to immature immunity,

environmental exposure, household crowding, suboptimal feeding practices, and early introduction of non-breast milk feeds. Breast milk contains secretory immunoglobulin A, lactoferrin, lysozyme, oligosaccharides, cytokines, and immune cells, which contribute to mucosal defense and reduce pathogen adherence in the respiratory and gastrointestinal tracts.[4, 13]

A significant association was observed between exclusive breastfeeding and diarrhea in the current study. Diarrhea was reported in 26.0% of exclusively breastfed children compared with 45.9% of non-exclusively breastfed children, and the association was statistically significant. This finding agrees with recent evidence showing that exclusive breastfeeding protects against diarrheal morbidity during infancy. A 2025 rapid review and meta-analysis reported that exclusive breastfeeding was associated with a 43% reduction in diarrhea risk among infants aged 0–6 months. Another recent global burden study showed that non-exclusive breastfeeding contributes substantially to childhood diarrheal disease burden, particularly among younger infants.[2-3] The protective effect of breastfeeding against diarrhea may be explained by reduced exposure to contaminated water or formula, enhancement of intestinal barrier function, promotion of beneficial gut microbiota, and transfer of maternal antibodies through breast milk.

The study also found that acute respiratory tract infection was significantly more common among non-exclusively breastfed children than exclusively breastfed children, with rates of 53.4% and 32.7%, respectively. This result is consistent with recent studies demonstrating a protective role of exclusive breastfeeding against respiratory infections. A 2024 study using data from South Asian countries found that exclusive breastfeeding was associated with lower odds of acute respiratory infection in some settings, while bottle feeding was identified as a risk factor for acute respiratory infection. In addition, a 2025 umbrella review concluded that non-exclusive breastfeeding was associated with increased risk of pneumonia and asthma among under-five children.[1, 6] Breastfeeding may reduce respiratory morbidity through passive transfer of maternal antibodies, anti-inflammatory factors, and immune-modulating substances that strengthen respiratory mucosal immunity.

Fever episodes were also significantly more frequent among children who were not exclusively breastfed compared with those who were exclusively breastfed. Fever is a nonspecific indicator of infectious morbidity and may reflect respiratory, gastrointestinal, urinary, or systemic infections. The higher frequency of fever among non-exclusively breastfed children supports the broader protective effect of breastfeeding against infectious illnesses. Similar findings were reported by Hossain et al., who found that exclusive breastfeeding was associated with lower odds of fever in some South Asian countries. These findings suggest that exclusive breastfeeding may reduce overall infectious burden, not only specific illnesses such as diarrhea or respiratory infection.[1]

Hospital admission due to illness was significantly higher among non-exclusively breastfed children than exclusively breastfed children in the present study. This finding suggests that breastfeeding may reduce not only the occurrence of illness but also illness severity. Recent systematic evidence supports the association between breastfeeding and reduced risk of moderate-to-severe respiratory and gastrointestinal infections among infants and children. A recent review in Pediatrics concluded that greater breastfeeding exposure was associated with beneficial effects for several infant and child health outcomes, including reduced risk of moderate-to-severe gastrointestinal and respiratory infections. A 2026 systematic review also evaluated breastfeeding duration and hospitalization risk among children under five, highlighting the relevance of breastfeeding in reducing severe infection-related outcomes.[4, 7]

The association between type of feeding and common childhood illnesses was also significant in the current study. The frequency of diarrhea, acute respiratory tract infection, fever, and hospital admission was lowest among exclusively breastfed children and highest among formula-fed children. This gradient supports a dose-response pattern in which exclusive breastfeeding provides the greatest protection, mixed feeding provides partial protection, and formula feeding provides the least protection. Formula feeding may increase exposure to contaminated bottles, water, or preparation practices, especially in settings where sanitation and safe water access may be inconsistent. Mixed feeding may also reduce breast milk intake and interfere with the immunological benefits of exclusive breastfeeding. Similar findings were reported in recent studies showing that bottle feeding and non-exclusive breastfeeding were associated with increased risk of diarrhea, fever, and acute respiratory infection.[1, 5]

Complementary feeding was introduced at the recommended age of six months in 48.4% of children, while 31.6% received complementary feeding before six months and 20.0% after six months. Early introduction of complementary foods may increase the risk of diarrhea and other infections because the infant may be exposed to contaminated food or water before full maturation of gut immunity. Delayed complementary feeding, on the other hand, may increase the risk of nutritional deficiency and impaired growth after six months. Therefore, appropriate timing of complementary feeding is essential to balance nutritional requirements and infection prevention. Recent infant and young child feeding evidence continues to emphasize exclusive breastfeeding for the first six months followed by safe and adequate complementary feeding while breastfeeding continues.[12]

This study was limited by its cross-sectional nature, which allows assessment of associations but does not confirm causality between breastfeeding practices and childhood illnesses. In addition, information about breastfeeding patterns and previous illness episodes depended on maternal or caregiver recall, which may introduce reporting bias. The use of a convenient sample from selected health facilities may also reduce the generalizability of the findings to the wider population of children under two years. Moreover, several factors that could influence childhood morbidity, such as vaccination status, household environment, sanitation, nutritional status, and socioeconomic conditions, were not evaluated in detail.

5- CONCLUSION AND RECOMMENDATION

The study concluded that suboptimal breastfeeding practices were common among children under two years attending Baghdada Primary Health Care Centers and the Pediatric Consultation Clinic at Mosul General Hospital, with less than half of the children exclusively breastfed during the first six months and more than half not initiated on breastfeeding within the first hour after birth. Non-exclusive breastfeeding and formula feeding were significantly associated with higher frequencies of diarrhea, acute respiratory tract infection, fever episodes, and hospital admission, indicating the protective role of exclusive breastfeeding against common childhood illnesses. Therefore, strengthening breastfeeding promotion programs is recommended through antenatal counseling, immediate postnatal support, education of mothers and families about exclusive breastfeeding for the first six months, discouragement of unnecessary formula use, and regular follow-up at primary health care centers to improve breastfeeding practices and reduce preventable childhood morbidity.

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