Relationship between Type of Feeding and Duration of Hospitalization of Infants Admitted for Diarrhea in Babylon Maternity and Paediatrics Teaching Hospital

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Abstract

Background: Breast milk is considered the best type of feeding for infants. WHO recommends exclusive breastfeeding for 6 months, and the continuation of breastfeeding for up to 2 years of age. It has a role in reducing morbidity and mortality of diarrhea. In Iraq, diarrheal diseases are considered 2nd most common cause of mortality among children, therefore, promotion of breast-feeding may help reduce diarrhea in Iraq.

Aim of the Study: To identify the type of feeding in patients with diarrhea, and to assess the relationship between the type of feeding and the duration of hospitalization for infants admitted for diarrhea in Babylon Maternity and Paediatrics Teaching Hospital.

Patients & Methods: This study is an observational analytical study conducted in Babylon Maternity And Paediatrics Teaching Hospital during the period from April 2018 through June 2018 and included information from a 96 pediatric patients admitted in the aforementioned hospital for diarrhea. Patients' exposure to breast milk was assessed as well as other characteristics.

Results: Study included a total of 96 patients with age ranging from days up to 36 months. Linear regression has shown a significant difference in duration of hospitalization among those who are breastfed and those who are not, t=1.42, P-value=0.001. ANOVA demonstrated a significant relationship between dehydration level and duration of hospitalization. Student's t-test has shown a significant relationship between water source and the duration of hospitalization (P-value = 0.012).

Conclusion: There is a significant relationship between breastfeeding and the duration of hospitalization of diarrhea patients when adjusted for age group and sex. Also there is a strong relationship between source of water and duration of hospitalization. Similarly, there is a significant correlation between severity of dehydration and the duration of hospitalization.

Keywords: diarrhea; risk factors; breast feeding

1.1 Introduction

Breast milk has long been considered the best type of feeding for infants[1]. It is a known fact that breast milk contains various immunological components that has virucidal, bactericidal, and fungicidal properties, helping the growing infant to fight infections[2].

The World Health Organization (WHO) recommends exclusive breastfeeding for 6 months, and the continuation of breastfeeding for up to 2 years of age[3]. They have reported that 38% of world infants had exclusive breastfeeding till 6 months of age[4].

It is suggested that breast-feeding has a role in reducing morbidity and mortality of diarrheal diseases as well as reducing possible complications affecting the nutritional state of the child[5]. In addition to the immunological properties of the milk that promote the child's immune system; breastfeeding itself does reduce the exposure to fluids and foods that could be contaminated with pathogens, further reducing exposure to disease[6].

Considering the fact that diarrheal diseases accounts for about 2.5 billion cases each year[7] with up to 1.34 million deaths among children who are less than 60 months of age; it becomes important to assess and document the effects of breastfeeding on the prevention and treatment of diarrheal diseases[8].

Factors that contribute to the incidence of diarrheal disease include inadequate sanitation of water or lack of safe water source, hygiene practices, and contamination of water sources with untreated fecal waste[7].

Duration of hospitalization is considered a marker of disease severity, and is associated with increased costs of health services. Since infants with breastfeeding have lower incidence of disease, it is suggested that infants with formula feeding results in higher costs of health care[9].

In Iraq, diarrheal diseases are considered the second most common cause of mortality among children, therefore, the control of diarrheal diseases (CDD) program is a part of a national strategy that aims at improving quality of life as well as reducing the burden of disease. This strategy includes promotion of breast-feeding as an important measure for improving child wellbeing[10].

1.2 Aim of the Study

To identify the type of feeding in patients with diarrhea, and to assess the relationship between the type of feeding and the duration of hospitalization for infants admitted for diarrhea in Babylon Maternity and Paediatrics Teaching Hospital.

2. Patients and Methods

2.1. Study Design and Sample

This study is an observational analytical study conducted in Babylon Maternity and Paediatrics Teaching Hospital during the period from April 2018 through June 2018 and included information from a total of 96 pediatric patients admitted in the aforementioned hospital for diarrhea.

Data obtained from study participants included age and gender of the baby, age of the mother, duration of hospitalization, occupation of the mother, residence and water source of the family, dehydration level, and feeding status of the baby.

2.2. Ethical Considerations

Verbal informed consent was obtained individually from mothers of participants at the beginning of the interview after explaining the purpose of the study and the type of data required, and respondents were assured of data confidentiality and privacy.

2.3. Statistical Analysis

At the end of the interview and examination, questionnaire forms were checked to avoid missing data. SPSS® Software version 23.0 for Linux® was used to perform statistical analysis for this study. Qualitative data were presented as numbers and percentages, while continuous data were presented as mean ± standard deviation. Comparison of study groups was carried out using Linear regression, ANOVA test, and Student's t-test. P-value of < 0.05 was considered statistically significant.

3. Results

The study included 96 patients admitted for diarrhea during the period from April 2018 through June 2018. The age of the patients ranged from few days up to 36 months (3 years), with a mean of (8.4 ± 7.9) months and a median of 7 months. Figure (3-1) illustrates the age distribution of the study population, while Figure (3-2) illustrates the gender distribution of the study population.

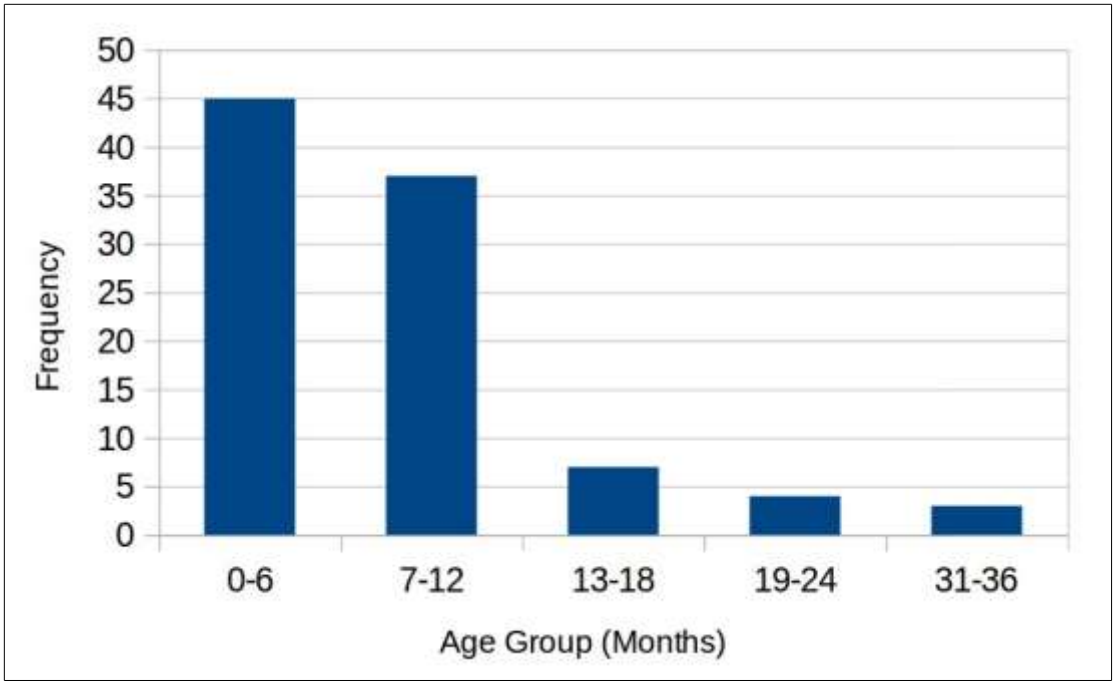

Figure (3-1)

Distribution of study population according to age groups

Ages of mothers of admitted patients ranged from 12-47 years, with a mean of (26.1±9.0) years and a median of 25 years. Figure (3-3) shows the age group distribution of the mothers of study participants.

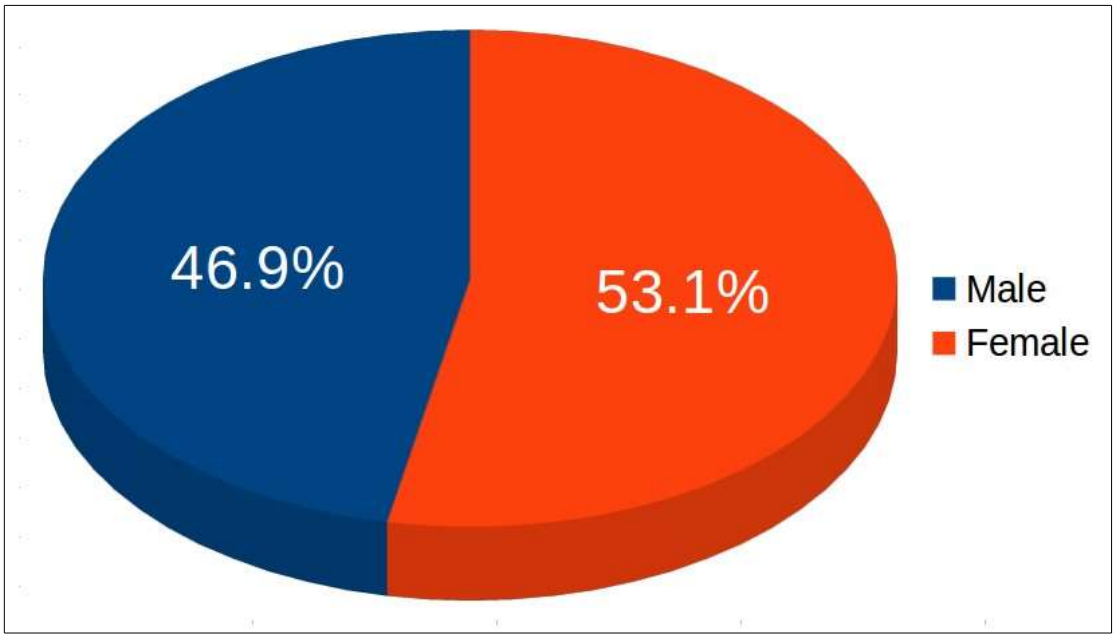

Figure (3-2)

Gender distribution of study participants

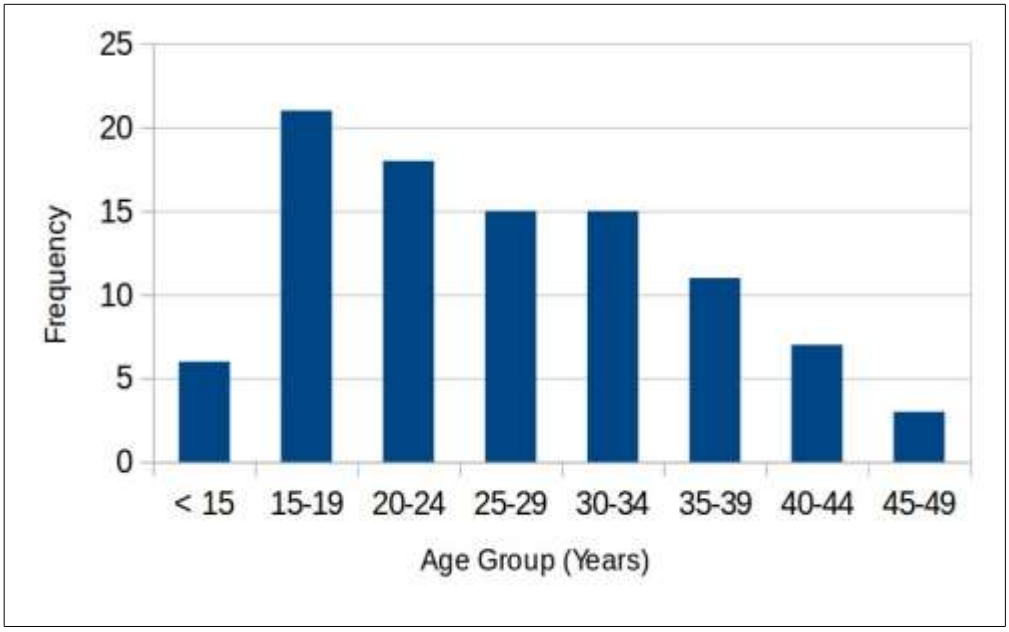

Figure (3-3)
Distribution of patients' mothers according to age groups

Dehydration level of study population ranged from mild dehydration to severe dehydration, with the majority of patients suffering from mild dehydration (49.0%), while moderate dehydration comprised (43.8%) and severe dehydration comprised (7.3%), Figure (3-4). Duration of hospitalization of study population ranged from 1 day to 10 days, with a mean of 3.3 days and a median of 3 days (Figure 3-5).

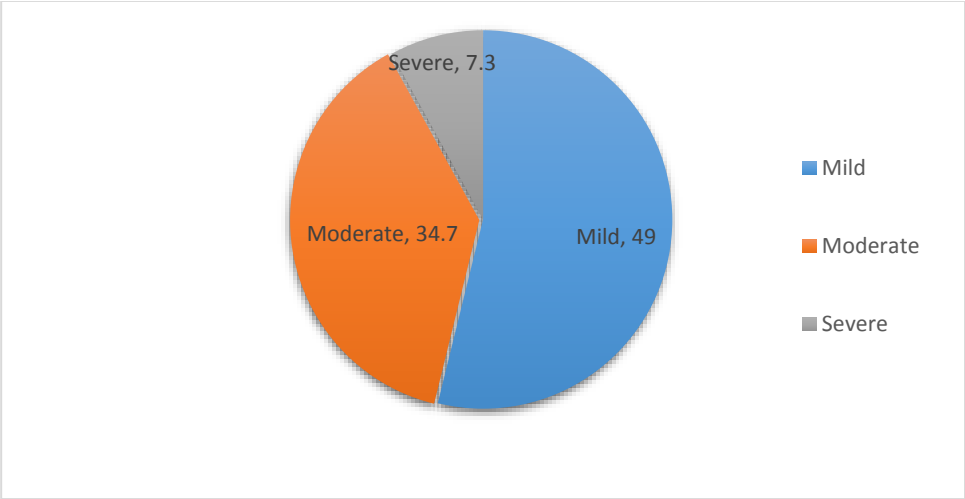

Figure (3-4)

Dehydration levels of study population

More than 73% of the mothers have reported that they breastfed their babies, while the remaining reported that they did not breastfeed their babies. However, 77% of breastfeeding mother did also give their babies formula milk. Table (3-1) describes the type of feeding of the study participants.

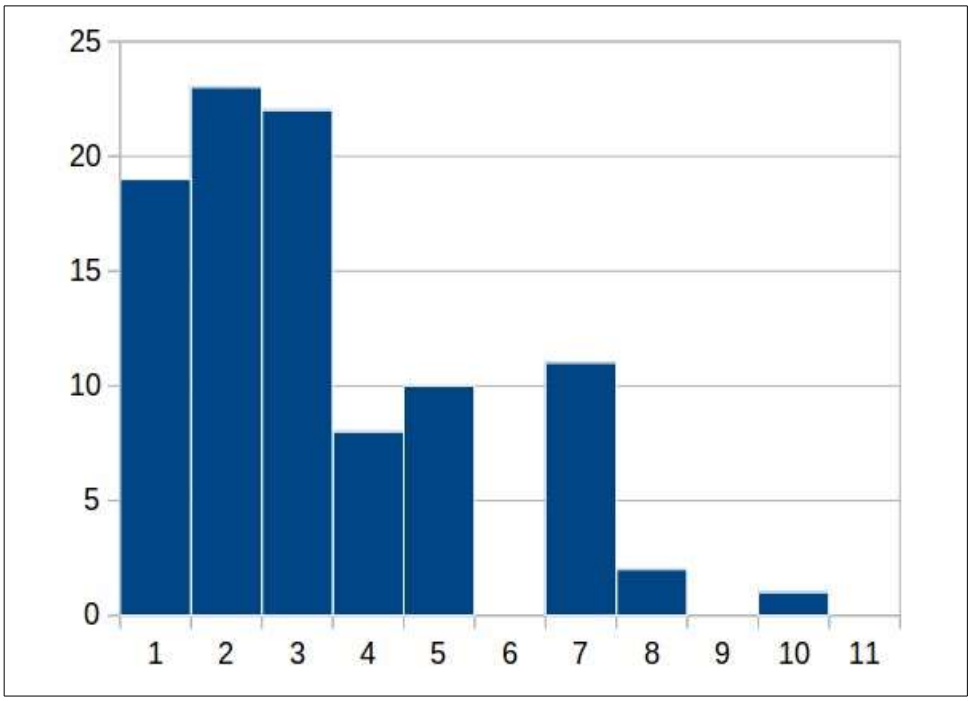

Figure (3-5)
Duration of hospitalization of study population

Table (3-1)

Type of feeding of study participants

Ingestion of other types of food	Type of milk feeding				Total
	No milk provided	Breast milk alone	Formula milk alone	Mixed	
Yes	5 (11.9%)	-	17 (40.5%)	20 (47.6%)	42 (100%)
No	-	16 (29.6%)	3 (5.6%)	35 (64.8%)	54 (100%)
Total	5 (5.2%)	16 (16.7%)	20 (20.8%)	55 (57.3%)	96 (100%)

Comparing the duration of hospitalization, Student's t-test has shown no significant difference in duration of hospitalization among patients with formula milk and patients without formula milk (P-value = 0.296). Comparison of duration of hospitalization with certain characteristics of study participants is summarized in Table (3-2). Only water source has shown a significant relationship with the duration of hospitalization (P-value = 0.012).

Table (3-2)
Comparison of duration of hospitalization with certain characteristics

Characteristics		Duration of Hospitalization in days (Mean ± SD)	P-value
Sex	Male	3.67 ± 2.23	0.098
	Female	2.96 ± 1.92	
Formula milk	Yes	3.17 ± 2.02	0.296
	No	3.71 ± 2.33	
Occupation	Housewife	2.67 ± 1.56	0.270
	Working mother	3.38 ± 2.14	
Residence	Rural	3.84 ± 2.38	0.076
	Urban	3.03 ± 1.90	
Water source	Tap water	4.06 ± 2.51	**0.012**
	Filter water	2.83 ± 1.65	

Similarly, linear regression was performed to assess the relationship between duration of hospitalization and breast feeding with adjustment for sex and age group. There was a statistically significant difference in duration of hospitalization among those who are breastfed and those who are not (adjusted for age group and sex), t=1.42, P-value=0.001.

ANOVA test was used to assess the relationship between dehydration level and duration of hospitalization. There was a statistically significant relationship between the two variables, P-value < 0.001.

To further investigate the relationship between duration of hospitalization and the dehydration level; Tukey HSD Post-hoc test was implemented as detailed in Table (3-3). This test has shown that the duration of hospitalization was significantly different

between both mild and moderate dehydration, and among moderate and severe dehydration. The mean difference in duration of hospitalization between cases with mild and moderate dehydration was about 2 days, and between cases with moderate and severe dehydration was about 4 days, while the difference between cases with mild dehydration and severe dehydration was more than 5 days (Table 3-3).

Table (3-3) Results of Tukey HSD Post-hoc test

Relationship	Mean Difference (days)	95% Confidence Interval	P-Value
Mild vs. Moderate	-1.71	-2.47 to -0.95	< **0.001**
Mild vs. Severe	-5.42	-6.88 to -3.97	< **0.001**
Moderate vs. Severe	-3.71	-5.18 to -2.25	< **0.001**

Discussion

The results of this study have demonstrated that there is a strong statistically significant relationship between type of water source and the duration of hospitalization for diarrhea. Oloruntoba et al. have reported that lack of safe water source may account for up to 88% of the burden of diarrhea[7].

Several studies have highlighted the important impact of the shortage in safe water sources on the incidence and morbidity of diarrhea, including the study by Hasanain et al. who conducted a cross-sectional study on 220 participants in Baghdad – Iraq during May 2009[11].

Another important finding was the significant effect of breastfeeding (adjusted for age group and sex) on the duration of hospitalization. This finding is similar to the finding by Ajetunmobi et al. who found a similar result in their retrospective study conducted on a birth cohort from 1997 through 2009 which included more than 500'000 participants[12]. Another review by Story et al. have concluded that the duration of diarrhea was longer in newborns who were fed with formula milk[2].

A study by Quigley et al. have suggested that exclusive breastfeeding for the baby protects against hospitalization for diarrheal diseases, and demonstrated an association between breastfeeding cessation and hospitalization for diarrhea[13]. This suggestion was also supported by Lamberti et al. in their meta-analysis review[8].

No significant difference was observed in duration of hospitalization between those whose residence in a rural area compared to those whose residence is in an urban area. This could possibly be explained by the urbanization of rural areas and the changing lifestyle in rural areas.

There was a strong statistically significant difference in duration of hospitalization according to the level of dehydration. Canavan et al. have found that the presence of more signs of dehydration is associated with prolongation in the length of stay in the hospital[14].

Conclusion

This study has demonstrated that there is a statistically significant relationship between breastfeeding and reduction in the duration of hospitalization for diarrhea in pediatrics age group when adjusted for age group and sex. The study have also demonstrated a strong relationship between the use of tap water (unfiltered water) and the prolongation of the duration of stay in hospital.

Also, the study found a strong significant correlation between the severity of dehydration in diarrhea patients and the duration of hospitalization, with a difference of up to 5 days between cases with mild dehydration and cases with severe dehydration.

CONFLICT OF INTERESTS.
There are non-conflicts of interest.

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الخلاصة

الخلفية: يعتبر حليب الأم أفضل أنواع التغذية للرضع. توصي منظمة الصحة العالمية بالرضاعة الطبيعية الحصرية لمدة 6 أشهر، واستمرار الرضاعة الطبيعية حتى عمر عامين. لها دور في الحد من المراضة والوفاة من الإسهال. في العراق ، تعتبر أمراض الإسهال السبب الثاني الأكثر شيوعًا للوفيات بين الأطفال ، وبالتالي ، قد يساعد الترويج للرضاعة الطبيعية في الحد من الإسهال في العراق.

الهدف من الدراسة: تحديد نوع التغذية لدى مرضى الإسهال ، وتقييم العلاقة بين نوع التغذية ومدة الاستشفاء بالنسبة للأطفال الذين يتم قبولهم للإسهال في مستشفى بابل للأمومة والطفولة التعليمي.

المرضى والطرق: هذه الدراسة عبارة عن دراسة تحليلية رصدية أجريت في مستشفى بابل للأمومة والطفولة التعليمي خلال الفترة من أبريل 2018 إلى يونيو 2018 وتضمنت معلومات من 96 مريض أطفال تم قبولهم في المستشفى المذكور أعلاه للإسهال. تم تقييم تعرض المرضى لحليب الثدي وكذلك الخصائص الأخرى.

النتائج: شملت الدراسة ما مجموعه 96 مريضا تتراوح أعمارهم بين أيام تصل إلى 36 شهرا. أظهر الانحدار الخطي فرقًا كبيرًا في مدة الاستشفاء بين أولئك الذين يرضعون رضاعة طبيعية وأولئك الذين لا يرضعون ، ر = 1.42 ، القيمة .P = 0.001 أظهرت ANOVA وجود علاقة كبيرة بين مستوى الجفاف ومدة الاستشفاء. أظهر اختبار t للطالب وجود علاقة معنوية بين مصدر المياه ومدة الاستشفاء قيمة.(P = 0.012)

هناك علاقة كبيرة بين الرضاعة الطبيعية ومدة الاستشفاء لمرضى الإسهال عند تعديلها حسب الفئة العمرية والجنس. أيضا هناك علاقة قوية بين مصدر المياه ومدة الاستشفاء. وبالمثل، هناك ارتباط كبير بين شدة الجفاف ومدة الاستشفاء.

الكلمات الدالة: الإسهال. عوامل الخطر؛ الرضاعة الطبيعية.