

Study on the Effectiveness of Breastfeeding Education in Reducing Neonatal Morbidity

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Abstract:

Aim: To evaluate the effectiveness of a structured breastfeeding education program in improving breastfeeding practices and reducing neonatal morbidity. **Materials and Methods:** This prospective cohort study included 100 pregnant women aged 18–40 years attending antenatal care at a tertiary hospital over 12 months. Participants were randomly assigned to an intervention group (n=50) receiving a structured breastfeeding education program or a control group (n=50) receiving routine antenatal care. The intervention consisted of three 60-minute sessions covering breastfeeding techniques, exclusive breastfeeding benefits, and addressing common challenges. Neonatal morbidity outcomes, breastfeeding initiation, and exclusivity rates were assessed through clinical records and follow-up calls within the first four weeks postpartum. **Results:** The intervention group showed significantly higher breastfeeding initiation (96% vs. 84%, p=0.05) and exclusive breastfeeding rates at four weeks postpartum (90% vs. 70%, p=0.01). Neonatal morbidity was significantly lower in the intervention group, with fewer cases of jaundice requiring phototherapy (10% vs. 24%, p=0.04), infections (6% vs. 20%, p=0.03), and hospital readmissions (8% vs. 28%, p=0.01). Satisfaction with the program was high, with 70% of participants in the intervention group reporting being "very satisfied." The program demonstrated high compliance, with 80% attending all sessions. **Conclusion:** Structured breastfeeding education significantly improves breastfeeding practices and reduces neonatal morbidity, including jaundice, infections, and hospital readmissions. Integrating such programs into routine antenatal care is a feasible, cost-effective strategy to enhance maternal and neonatal health outcomes.

Keywords: Breastfeeding education, neonatal morbidity, exclusive breastfeeding, antenatal care, maternal health.

INTRODUCTION

Breastfeeding is universally acknowledged as the optimal source of nutrition for newborns and infants, offering a myriad of benefits for both the child and the mother. Breast milk provides essential nutrients, antibodies, and bioactive compounds that are uniquely tailored to support the infant's immune system, promote healthy growth, and reduce the risk of various infections and diseases. Additionally, breastfeeding fosters a strong maternal-infant bond, which is critical for emotional and psychological development. Despite these well-documented benefits, breastfeeding practices remain suboptimal in many parts of the world, with challenges stemming from a lack of knowledge, cultural misconceptions, and inadequate support systems.¹ Neonatal morbidity remains a significant public health concern globally, particularly in low- and middle-income countries. Conditions such as neonatal jaundice, infections, respiratory complications, and feeding difficulties contribute to high rates of neonatal mortality and long-term health complications. Many of these conditions are preventable or manageable through effective breastfeeding practices, which underscores the critical role of breastfeeding education in reducing neonatal morbidity. While breastfeeding is a natural process, it is not always instinctive for new mothers, and many face challenges related to latching, milk

supply, and managing societal pressures to use formula. These challenges highlight the need for structured education programs to empower mothers with the knowledge and skills to initiate and sustain breastfeeding.² Breastfeeding education serves as a cornerstone in promoting optimal breastfeeding practices. Such programs typically include counseling on the benefits of exclusive breastfeeding, guidance on proper latching and positioning, and strategies to address common breastfeeding challenges. Additionally, they address cultural myths and misconceptions that often act as barriers to breastfeeding. By equipping mothers with the necessary information and support, breastfeeding education programs can improve breastfeeding initiation rates, enhance exclusivity, and prolong breastfeeding duration. These improvements, in turn, have a direct impact on reducing neonatal morbidity.³ The neonatal period, defined as the first 28 days of life, is a critical window for growth and development. It is during this time that infants are most vulnerable to infections and complications. Exclusive breastfeeding during this period has been shown to significantly reduce the risk of neonatal infections, gastrointestinal disturbances, and respiratory illnesses. Moreover, breastfeeding contributes to the early establishment of a healthy gut microbiome, which plays a crucial role in immune development and disease prevention. By reducing

reliance on formula feeding, which is associated with a higher risk of infections and other complications, breastfeeding can mitigate many of the factors that contribute to neonatal morbidity.⁴ One of the most common causes of neonatal morbidity is jaundice, a condition characterized by elevated bilirubin levels in the blood. While mild cases of jaundice are often self-limiting, severe cases may require hospitalization and phototherapy. Breastfeeding plays a vital role in preventing and managing neonatal jaundice by promoting regular bowel movements, which help eliminate bilirubin from the body. However, a lack of knowledge about proper breastfeeding practices can exacerbate the condition. Breastfeeding education programs can address this gap by teaching mothers how to recognize the signs of jaundice and ensure adequate milk intake for their newborns.⁵ Infections are another major contributor to neonatal morbidity. Neonates are particularly susceptible to infections due to their immature immune systems, and formula-fed infants are at an even greater risk due to the lack of protective antibodies found in breast milk. Exclusive breastfeeding provides a natural defense against infections by delivering immunoglobulins, lactoferrin, and other antimicrobial agents that enhance the infant's immune response. Effective breastfeeding education programs can reduce the incidence of neonatal infections by encouraging mothers to practice exclusive breastfeeding and teaching them proper hygiene and feeding techniques. Hospital readmissions during the neonatal period are often a marker of morbidity and healthcare system inefficiencies. Common reasons for readmissions include feeding difficulties, weight loss, and jaundice. These issues can be mitigated through breastfeeding education, which empowers mothers to manage feeding effectively and recognize potential complications early. Moreover, breastfeeding education programs can reduce the emotional and financial burden associated with hospital readmissions, benefiting both families and healthcare systems.⁶ While the benefits of breastfeeding education are well-documented, the implementation and uptake of such programs vary widely across regions and healthcare settings. In some areas, cultural norms and misconceptions about breastfeeding hinder mothers from seeking or accepting education. In others, healthcare providers may lack the resources or training to deliver effective programs. To maximize the impact of breastfeeding education on neonatal morbidity, it is essential to address these barriers and ensure that programs are accessible, culturally sensitive, and evidence-based. The effectiveness of breastfeeding education in reducing neonatal morbidity is not limited to improving health outcomes for infants. These programs also have a positive impact on maternal health by reducing the risk of postpartum depression, enhancing maternal confidence, and promoting a sense of accomplishment. By empowering mothers with the knowledge and skills to breastfeed successfully, education programs create a supportive environment that encourages mothers to

overcome challenges and sustain breastfeeding.⁷ Despite the clear benefits of breastfeeding education, gaps in knowledge and practice persist. Many mothers report feeling unsupported or unsure about their ability to breastfeed, particularly in the early postpartum period when challenges are most likely to arise. This highlights the importance of providing breastfeeding education during the antenatal period, as well as ongoing support in the postpartum phase. By addressing these gaps, healthcare systems can create a continuum of care that supports breastfeeding mothers and improves neonatal health outcomes.⁸ Breastfeeding education is a vital intervention for reducing neonatal morbidity and improving overall health outcomes for infants and mothers. By equipping mothers with the knowledge and skills to initiate and sustain breastfeeding, these programs address key factors contributing to neonatal morbidity, such as infections, jaundice, and feeding difficulties. However, the success of breastfeeding education depends on its accessibility, cultural appropriateness, and integration into routine antenatal and postnatal care. As the evidence base continues to grow, it is crucial to prioritize breastfeeding education as a cornerstone of maternal and child health initiatives worldwide.

MATERIAL AND METHODS

This was a prospective cohort study conducted to evaluate the effectiveness of breastfeeding education in reducing neonatal morbidity. The study was carried out over a period of 12 months at tertiary care hospital with participants recruited from antenatal clinics. The study included 100 pregnant women aged 18–40 years, who were in their second or third trimester of pregnancy and attending routine antenatal care. Participants were eligible if they intended to breastfeed and provided informed consent. Women with contraindications to breastfeeding, multiple pregnancies, or serious medical conditions were excluded from the study. The sample size of 100 participants was determined based on a power analysis to detect a clinically significant reduction in neonatal morbidity with a confidence level of 95% and a power of 80%. The study was approved by the Institutional Review Board. Written informed consent was obtained from all participants prior to enrollment. Participants were assured of confidentiality and their right to withdraw from the study at any time.

Recruitment and Group Allocation

Participants were recruited consecutively and assigned to one of two groups:

- **Intervention Group** (n=50): Received a structured breastfeeding education program.
- **Control Group** (n=50): Received routine antenatal care without additional breastfeeding education.

The allocation was done using a simple randomization process to minimize selection bias.

The intervention consisted of a structured breastfeeding education program delivered by certified lactation consultants through a combination of one-on-one counseling and group sessions. The program covered the importance of exclusive breastfeeding, techniques for proper latching and positioning, management of common breastfeeding challenges, and addressing myths and misconceptions about breastfeeding. Each participant in the intervention group attended three 60-minute sessions during the third trimester of pregnancy. Data were collected at two time points: baseline, where sociodemographic information, obstetric history, and breastfeeding intentions were recorded using a structured questionnaire, and postnatal, where neonatal morbidity data, including jaundice incidence, infections, and feeding-related complications, were collected during the first four weeks postpartum through clinical

records and follow-up calls. The primary outcome measure was neonatal morbidity, defined as hospital readmission within the first four weeks, neonatal jaundice requiring phototherapy, or documented infections such as sepsis, respiratory infections, or gastroenteritis. Secondary outcomes included breastfeeding initiation rates and exclusive breastfeeding rates at four weeks postpartum.

Statistical Analysis

Data were analyzed using SPSS version 25.0. Continuous variables were summarized using means and standard deviations, while categorical variables were presented as frequencies and percentages. The chi-square test was used to compare neonatal morbidity between the two groups. A p-value of <0.05 was considered statistically significant.

RESULTS AND OBSERVATIONS:

Table 1: Baseline Characteristics of Participants

The baseline characteristics of the participants were comparable between the intervention and control groups, ensuring minimal selection bias. The mean age of participants in the intervention group was 29.3 ± 4.5 years, while it was 28.7 ± 4.8 years in the control group, with no significant difference ($p=0.42$). Education levels were also evenly distributed, with most participants having completed secondary education (60% in the intervention group and 56% in the control group). Similarly, parity showed a balanced distribution, with 40% of participants in the intervention group and 44% in the control group being primiparous. All participants in both groups expressed an intention to breastfeed (100%), reflecting a strong baseline commitment to breastfeeding. The similarity in baseline characteristics supports the validity of subsequent comparisons of outcomes between the groups.

Table 2: Breastfeeding Initiation and Exclusive Breastfeeding Rates

The intervention group demonstrated significantly better breastfeeding outcomes compared to the control group. Breastfeeding initiation rates were higher in the intervention group (96%) than in the control group (84%), with borderline statistical significance ($p=0.05$). Exclusive breastfeeding at four weeks postpartum was significantly more common in the intervention group (90%) compared to the control group (70%, $p=0.01$). The intervention group also initiated breastfeeding earlier, with a mean time to first breastfeeding of 1.5 ± 0.7 hours compared to 3.4 ± 1.2 hours in the control group ($p=0.001$). Formula supplementation was significantly less frequent in the intervention group (16%) than in the control group (40%, $p=0.01$). Additionally, fewer participants in the intervention group reported breastfeeding challenges (24%) compared to the control group (44%, $p=0.03$), suggesting that the structured education program effectively equipped mothers to address common issues.

Table 3: Neonatal Morbidity Outcomes

The intervention group experienced significantly lower neonatal morbidity compared to the control group. Only 10% of neonates in the intervention group required phototherapy for jaundice, compared to 24% in the control group ($p=0.04$). Similarly, the incidence of infections was significantly lower in the intervention group (6%) than in the control group (20%, $p=0.03$). Hospital readmissions within the first four weeks of life were notably reduced in the intervention group (8%) compared to the control group (28%, $p=0.01$). While the rates of gastrointestinal and respiratory infections were lower in the intervention group (4% and 2%, respectively) compared to the control group (12% and 8%, respectively), these differences were not statistically significant ($p=0.15$ and $p=0.18$, respectively). Additionally, neonates in the intervention group were significantly less likely to experience weight loss exceeding 10% at one week (12% vs. 32%, $p=0.02$).

Table 4: Breastfeeding Education Attendance (Intervention Group Only)

Among participants in the intervention group, 80% attended all three education sessions, and these participants demonstrated a 95% compliance rate during follow-up. Attendance dropped with fewer sessions, with only 4% attending a single session, and compliance decreased correspondingly (50%). The most common reasons for missing sessions included lack of time (10%), health reasons (6%), and transportation issues (4%). These findings highlight the high engagement with the education program among most participants and emphasize the need for strategies to overcome barriers to attendance.

Table 5: Reasons for Hospital Readmissions

Hospital readmissions were more common in the control group, with 14 cases compared to 4 cases in the intervention group. Jaundice was the most common reason for readmission, accounting for 50% of cases in the intervention group and 57% in the control group ($p=0.85$). Other reasons included infections (25% vs. 29%, $p=0.90$) and feeding complications (25% vs. 14%, $p=0.60$). Low birth weight and poor weight gain at discharge were slightly more common in the control group, but these differences were not statistically significant ($p=0.75$ and $p=0.65$, respectively). However, the length of hospital stay was significantly shorter for neonates in the intervention group (3.5 ± 1.2 days) compared to the control group (5.2 ± 1.8 days, $p=0.03$), further emphasizing the positive impact of the intervention on neonatal outcomes.

Table 6: Satisfaction with Breastfeeding Education (Intervention Group Only)

Satisfaction with the breastfeeding education program was overwhelmingly positive among participants in the intervention group. A majority (70%) reported being "very satisfied," and 24% were "satisfied," while only 6% were neutral. This high satisfaction rate suggests that the structured education program was well-received and likely contributed to the improved breastfeeding practices and neonatal outcomes observed in the intervention group.

Table 1: Baseline Characteristics of Participants

Characteristic	Intervention Group (n=50)	Control Group (n=50)	p-value
Age (years), mean \pm SD	29.3 \pm 4.5	28.7 \pm 4.8	0.42
Education Level (%)			
- Primary	10 (20%)	12 (24%)	0.68
- Secondary	30 (60%)	28 (56%)	0.75
- Tertiary	10 (20%)	10 (20%)	1.00
Parity (%)			
- Primiparous	20 (40%)	22 (44%)	0.71
- Multiparous	30 (60%)	28 (56%)	0.71
Intended Breastfeeding (%)			
- Yes	50 (100%)	50 (100%)	—

Table 2: Breastfeeding Initiation and Exclusive Breastfeeding Rates

Outcome Measure	Intervention Group (n=50)	Control Group (n=50)	p-value
Breastfeeding Initiation (%)	48 (96%)	42 (84%)	0.05
Exclusive Breastfeeding at 4 Weeks (%)	45 (90%)	35 (70%)	0.01
Time to First Breastfeed (Hours, Mean \pm SD)	1.5 \pm 0.7	3.4 \pm 1.2	0.001
Use of Formula Supplementation (%)	8 (16%)	20 (40%)	0.01
Breastfeeding Challenges Reported (%)	12 (24%)	22 (44%)	0.03

Table 3: Neonatal Morbidity Outcomes

Neonatal Morbidity	Intervention Group (n=50)	Control Group (n=50)	p-value
Jaundice Requiring Phototherapy (%)	5 (10%)	12 (24%)	0.04
Infections (%)	3 (6%)	10 (20%)	0.03
Hospital Readmissions (%)	4 (8%)	14 (28%)	0.01
Gastrointestinal Infections (%)	2 (4%)	6 (12%)	0.15
Respiratory Infections (%)	1 (2%)	4 (8%)	0.18
Weight Loss >10% at 1 Week (%)	6 (12%)	16 (32%)	0.02

Table 4: Breastfeeding Education Attendance (Intervention Group Only)

Session Attendance	n (%)	Follow-Up Compliance (%)
Attended All 3 Sessions	40 (80%)	38 (95%)
Attended 2 Sessions	8 (16%)	6 (75%)
Attended 1 Session	2 (4%)	1 (50%)
Reasons for Missing Sessions (%)		
- Lack of Time	5 (10%)	
- Transportation Issues	2 (4%)	
- Health Reasons	3 (6%)	

Table 5: Reasons for Hospital Readmissions

Reason for Readmission	Intervention Group (n=4)	Control Group (n=14)	p-value
Jaundice	2 (50%)	8 (57%)	0.85
Infections	1 (25%)	4 (29%)	0.90
Feeding Complications	1 (25%)	2 (14%)	0.60
Low Birth Weight (%)	2 (50%)	5 (36%)	0.75
Poor Weight Gain at Discharge (%)	1 (25%)	6 (43%)	0.65
Length of Hospital Stay (Days, Mean \pm SD)	3.5 \pm 1.2	5.2 \pm 1.8	0.03

Table 6: Satisfaction with Breastfeeding Education (Intervention Group Only)

Satisfaction Level	n (%)
Very Satisfied	35 (70%)
Satisfied	12 (24%)
Neutral	3 (6%)

DISCUSSION

This prospective cohort study demonstrates the effectiveness of a structured breastfeeding education program in improving breastfeeding practices and reducing neonatal morbidity. The comparable baseline characteristics between the intervention and control groups validate the reliability of the observed outcomes. The mean age of participants (29.3 \pm 4.5 years in the intervention group and 28.7 \pm 4.8 years in the control group) is consistent with the findings of Matias et al. (2018), who reported a mean maternal age of 28.6 \pm 5.1 years in their study on breastfeeding education.⁸ Additionally, the parity and education level distributions in this study are similar to those reported by Hannula et al. (2008), which highlighted that secondary education is a common level among mothers attending antenatal care.⁹ The breastfeeding initiation rate was significantly higher in the intervention group (96%) compared to the control group (84%, $p=0.05$). These findings are consistent with those of Bhandari et al. (2003), who reported increased initiation rates after providing breastfeeding counseling. The exclusive breastfeeding rate at four weeks was also significantly higher in the intervention group (90%) than in the control group (70%, $p=0.01$).¹⁰ Similar results were observed in a study by Kiani et al. (2020), where exclusive breastfeeding rates increased from 60% to 88% following structured educational sessions.¹¹ The earlier initiation of breastfeeding in the intervention group (1.5 \pm 0.7 hours vs. 3.4 \pm 1.2 hours, $p=0.001$) highlights the role of education in fostering prompt breastfeeding. Early initiation has been shown to reduce

neonatal mortality by 22% (Edmond et al., 2006).¹² The lower use of formula supplementation in the intervention group (16% vs. 40%, $p=0.01$) corroborates findings by Rollins et al. (2016), who identified education as a critical factor in reducing formula use.¹³ The reduced challenges reported by the intervention group (24% vs. 44%, $p=0.03$) align with studies such as those by Kronborg et al. (2012), which found that education improved maternal confidence in managing breastfeeding difficulties.¹⁴ Neonates in the intervention group experienced significantly lower morbidity. For instance, only 10% required phototherapy for jaundice compared to 24% in the control group ($p=0.04$). This reduction is consistent with findings from a study by Agampodi et al. (2017), which highlighted that improved breastfeeding practices mitigate the risk of neonatal jaundice.¹⁵ Infections were significantly less frequent in the intervention group (6% vs. 20%, $p=0.03$), and hospital readmissions were notably lower (8% vs. 28%, $p=0.01$). These results align with those of Victora et al. (2016), who found that exclusive breastfeeding significantly reduced infections and hospitalizations in the neonatal period.¹⁶ Weight loss exceeding 10% at one week was also lower in the intervention group (12% vs. 32%, $p=0.02$). This finding is supported by Cakmak and Kuguoglu (2007), who demonstrated that breastfeeding education improves neonatal weight gain by enhancing breastfeeding techniques and maternal confidence.¹⁷ The high attendance rate (80% attending all three sessions) and compliance (95%) underscore the acceptability of the program. Barriers to attendance, such as time

constraints and transportation issues, reflect findings by Inoue et al. (2012), who identified similar challenges in breastfeeding education programs. Addressing these barriers through flexible schedules and remote counseling could further improve attendance and outcomes.¹⁸ Hospital readmissions were significantly lower in the intervention group (4 cases vs. 14 cases). Jaundice (50% of readmissions in the intervention group) remained the leading cause, consistent with findings by Burke et al. (2015), who reported jaundice as the most common cause of neonatal readmissions.¹⁹ The shorter hospital stays in the intervention group (3.5 ± 1.2 days vs. 5.2 ± 1.8 days, $p=0.03$) align with research by Bartick and Reinhold (2010), which linked breastfeeding support with reduced healthcare costs and hospital stays.²⁰ The high satisfaction rate in the intervention group (70% "very satisfied") reflects the program's effectiveness and acceptability. Similar results were reported by Ismail et al. (2014), who found that structured breastfeeding education significantly improved maternal confidence and satisfaction with breastfeeding.²¹

CONCLUSION

This study demonstrates that a structured breastfeeding education program significantly improves breastfeeding initiation, exclusivity, and maternal confidence, while reducing neonatal morbidity, including infections, jaundice, and hospital readmissions. The findings highlight the critical role of education in equipping mothers with the knowledge and skills to overcome breastfeeding challenges and promote neonatal health. High satisfaction levels among participants underscore the program's acceptability and feasibility. Integrating breastfeeding education into routine antenatal care can serve as an effective, low-cost strategy to improve maternal and neonatal health outcomes, ultimately reducing the burden on healthcare systems.

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