[Downloaded free from http://www.jcnonweb.com on Saturday, May 15, 2021, IP: 88.241.48.74]

Original Article

Family-Centered Lactation Counseling and Breastfeeding in Preterm Infants upon Neonatal Intensive Care Discharge

Hakan Ongun, Meltem Demir

Department of Neonatology Istinye University Medical Park Hospital, Antalya, Turkey

Abstract

Background: There is great variability in breastfeeding implications upon neonatal intensive care unit discharge for preterm infants. Aims and Objectives: To examine the breastfeeding rates and the impact of lactation-counseling on the nutrition following hospital discharge in preterm infants. **Materials and Methods:** A three-page survey was applied to the families of infants of gestational age ≤34 weeks who were hospitalized between 2016-2018. Exclusion criteria were family reluctance to consent, foster-care placement, acquiring enteral feeding by orogastric tube/gastrostomy. The group categorization was based on lactation-counselling that involved both parents and elderly relatives who would assist the mother at neonatal care. Statistics were performed using SPSS-22 for covariates of neonatal intensive care interventions and post-discharge nutrition. **Results:** Exclusive breastfeeding was 49.2% at hospital-discharge and declined to 31.3% at six months. Early introduction of complementary foods was 51.1%. Total duration of breastfeeding was 7.38±3.98 months. Lactation-counseling prolonged breastfeeding duration to 8.47±3.87 months. The program presented the highest odds of extending breastfeeding interventions beyond six months (OR: 2.183, 95% CI: 1.354–3.520). It favored the outcomes by reducing the introduction of formulas and complementary foods before six months (P = 0.044, P = 0.018). The physical contribution of the father towards nutrition was the most significant benefit claimed by the participants. (71.6 versus 51.8%). **Conclusion:** Family-centered peer lactation-counseling by the medical staff and increasing awareness for infant nutrition are promising local strategies in reaching the goals of national nutrition policies guided by the international recommendations in preterm infants.

Keywords: *Breastfeeding, lactation counseling, neonatal intensive care unit, nutrition, prematurity*

Submitted: 12-Oct-2020
Revised: 10-Dec-2020
Accepted: 16-Dec-2020
Published: 15-May-2021

Introduction

Breast milk feeding (BMF) is the recommended source of nutrition providing short- and long-term beneficiary effects.[1,2] It ensures optimal growth and food security in the neonate and improves survival of 820.000 lives per year.[3] Health benefits are also applicable to preterm infants.[4] Improved feeding tolerance, enhanced intestinal maturation, and reduced intestinal complications are some of the profits specific to prematurity.[1] Attenuated incidence of late-onset sepsis, chronic lung disease, and childhood development are the dose dependent, positive impacts in a more specific population of infants weighing <1500 g.[5]

Access this article online

Quick Response Code:

Website: www.jcnonweb.com

DOI: 10.4103/jcn.jcn_167_20

Despite the evidence, BMF utilization in preterm neonates is lower at hospital discharge and breastfeeding continuity is shorter compared to their term counterparts.[6,7] Complicated preterm delivery, comorbid maternal health problems, stress of having a newborn receiving intensive care, and pumping milk instead of breastfeeding are unique barriers specific to the mother of the preterm. The absence of environmental

Address for correspondence: Hakan Ongun, Department of Neonatology, Istinye University Medical Park Hospital, Antalya, Turkey.
E-mail: hongun88@hotmail.com

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Ongun H, Demir M. Family-centered lactation counseling and breastfeeding in preterm infants upon neonatal intensive care discharge. J Clin Neonatol 2021;10:95-102.

[Downloaded free from http://www.jcnonweb.com on Saturday, May 15, 2021, IP: 88.241.48.74]

conditions, limited support of the health-care provider, and inadequate acquaint of the mother with the benefits of BMF increase the challenges.[1,8] Even so, there is evidence that virtually all women can breastfeed if the mothers of these infants are provided accurate knowledge and support.[9]

The World Health Organization (WHO) and United Nations Children's Fund (UNICEF) have advocated national policies to support breastfeeding practices of the infant and young child and launched baby-friendly hospitals initiatives (BFHI) three decades ago.[3,10,11] As more and more birth centers are becoming baby-friendly, it is imperative to promote BMF for the critically-ill neonate who require advanced neonatal care. Unfortunately, the concept of BFHI remains to be unsuited for many neonatal intensive care units (NICU).[12] Recent studies have emphasized great variability in breastfeeding practices and lactation counseling at NICU discharge for preterm infants.[5,13] Neonatal intensive care nurse plays a critical role in supporting the provision of maternal milk and breastfeeding during the initial hospital stay. Shortage of nurse staffing and concentrating on the medical needs of the critically ill neonate may underrate the provision of BMF in the NICU context. In a 2014 report analyzing 6060 nurses who took care of 15233 infants, only 14%–15% of parents have received breastfeeding support in the NICU.[14] Sharing similar problems and concerns for breastfeeding utility upon discharge, the study center (Baby-Friendly initiative since 2012) has launched a contemporary family-centered lactation counseling program (LCP) that involved the participation of both parents and elderly relatives of all neonates requiring intensive care in 2017. The present study was conducted to examine breastfeeding utility and LCP efficiency on 1-year breastfeeding outcomes on hospital discharge.

Methods

This retrospective study was approved by local ethics committee (no: 2019/6, date: 08.19.2019). The consent of each study participant was attained in accordance with the ethical principles for human investigations and outlined in the Second Declaration of Helsinki.

Study center

The university-affiliated facility has a 34-bed, tertiary, heavily populated NICU located in the south coast of Turkey. Nurse staffing is to work 12 h shifts in a week and nurse-to-patient ratio is 1:4–1:5 in the NICU. The employed nurses have baccalaureate degree for neonatal care. Approximately 1/6-1/7 of the nurses are national board-certified for lactation counseling; however, all nurses deliver regular training for lactation counseling in respect to institutional policy.

Baby-friendly initiative and peer lactation counseling

The facility is a baby-friendly hospital since 2012 and fulfills UNICEF's BFHI criteria and Turkish Ministry of Health's BFHI Program Further Recommendations for NICU.[11,15] These include: (i) initiate breastfeeding and oropharyngeal colostrum once the health status of the newborn is stable for breastfeeding as soon as possible (*stable preterm refers to the absence of desaturation, apnea, and bradycardia*), (ii) if breastfeeding is not possible, apply maternal milk by cup, injector or orogastric route, (iii) provide rooms for the mothers and support milk sucking within 6 h of birth and every 2–3 h afterward, (iv) kangaroo mother care, and (v) providing rooms to enable mother-baby relationship once the preterm neonate is mature enough to achieve oral feeding and maintain normothermia at room temperature before hospital discharge.

By the beginning of 2017, a contemporary LCP has also been launched for the mothers of all neonates requiring intensive care in addition to BFHI requirements. This program has consisted of several upgrades such as: (i) selection of nurses specific for peer-to-peer lactation counseling, (ii) organizing the nursery shifts accordingly to enable their presence on day-time shifts for daily peer-counseling, (iii) the organization of 45 min of private counseling sessions initiated 5 days before hospital discharge in a lactation-equipped meeting room outside NICU, (iv) participation of family members including both parents and elderly care-taker/relatives who will assist the mother at neonatal-care, (v) recruiting the staff neonatologist or the pediatricians in the session for professional assistance on breastfeeding and infant nutrition after discharge.

Study population

The design of the study has consisted of two steps: to identify all preterm (gestational age ≤34 weeks) NICU admissions between February 2016 and January 2018 and then to contact their families for face-to-face interviews. Exclusion criteria were infant death after NICU discharge, family reluctance to consent for the study, foster-care placement and acquiring enteral feeding by orogastric/nasogastric tube or gastrostomy upon discharge. The participants were asked to fill in the three-page survey (23 questions) to collect 1-year nutrition and breastfeeding practices upon hospital discharge (*see Supplemental Table 1 for the survey*).

The definitions of terms commonly used in the manuscript are BMF: Total sum of breastmilk including

[Downloaded free from http://www.jcnonweb.com on Saturday, May 15, 2021, IP: 88.241.48.74]

"*breastfeeding only,*" "*breastmilk+milk fortifier*" and "*breastmilk+formulary*" by any method (*breastfeeding,* orogastric/nasogastric *tube, feeding cup, bottle, or syringe*), exclusive breastfeeding (EBF): Infant's nutrition of 100% of mother's milk, *continued BMF*: Any volume of maternal milk (with or without a fortifier) and contemporary foods, *contemporary foods*: Semi-solid or solid foods other than breastmilk and formula and *milk other than human milk*: Cow or goat milk. We have to mention Turkish laws do not govern national donor milk bank; however, common practice is to use breastmilk of a family relative/local trusted neighbor when the mother's milk is not available.

The group categorization was based on delivery of peer LCP. Descriptive analysis was performed for covariates of obstetric characteristics and NICU interventions (birthweight, gestational age, discharge weight, parity, multiple birth, mode of delivery, smoking at postnatal period, family sociodemographic data (including single parent, siblings, education, occupational status, and family's economic status) and 1-year nutritional outcome. Chi-square or Fisher's exact test was used for categorical and Mann–Whitney U-test or Student's *t*-test for numeric variables (following normality assumption). Variables were express as mean ± standard deviation and median (interquartile range [IQR]) and percentage (%). Spearman's rank correlation and logistic regression using SPSS version 22 software (IBM Corp., Armonk, NY, USA) statistical package have analyzed factors related to the length of BMF.

Results

Three hundred and fifty-eight families have filled in the survey out of 435 preterm NICU admissions (77 exclusions; due to contact failure in 46, reluctance to consent in 19; infant death upon NICU discharge in five, foster care in four and gastrostomy in three infants). Of them, 190 (53.1%) families have received LCP before hospital discharge. The study population's demographics have shown male predominance (52.8%) with gestational age of 32 weeks (IQR: 30–33 weeks), birth weight of 1620 g (IQR: 1266.5–1840 g), and hospital discharge weight of 2240 g (IQR: 2140–360 g). NICU nutritional data have verified 77.1% of the infants received maternal milk within the 1st day by breastfeeding or orogastric route once the cardiorespiratory dynamics were achieved. The general demographics of the infants and the families can be observed at Tables 1 and 2.

Nutrition after hospital discharge

Approximately 90.2% of the infants have delivered BMF at discharge. Of the study group, 49.2% of the infants have received EBF at hospital discharge. Total duration of breastfeeding was 7.38 ± 3.98 months. Birth weight and length of NICU stay has shown the strongest correlation with BMF duration (r = 0.366 and r = −0.290). Tables 3 and 4 present the correlations with breastfeeding duration and postdischarge nutrition outcome. Introduction of complementary foods before 6 months was 51.1%; cessation of breast milk has appeared to be the main reason beneath (69.6%).

Lactation counseling program

One hundred and ninety families have delivered lactation counseling. Despite the similar prevalence of EBF at hospital discharge, 4th and 6th months, the total length of BMF was longer in families delivering LCP [8.47 ± 3.87 months vs. 6.15 ± 3.75 months, $P < 0.001$, Table 4]. The peer counseling has favored the outcomes in terms of reduced use of formulas in addition to maternal milk and lesser introduction of complementary foods before 6 months (P = 0.044, P = 0.018). The most significant benefit of the program has appeared to be the "physical contribution of the father" on infant's nutrition (71.6% vs. 51.8%, $P < 0.001$). In the multivariable logistic regression [Table 5], peer lactation counseling has shown the highest odds of extending breastfeeding implementations beyond 6 months by 2.183 times in preterm infants [odds ratio: 2.183, 95% confidence interval (CI): 1.354–3.520, P = 0.001; Table 5].

Discussion

The present study has evaluated the postdischarge nutritional practices and the influence of family-based peer lactation counseling in preterm NICU admissions. The outcomes were; (i) 77.1% of the infants received maternal milk within the 1st day of NICU admission by breastfeeding or orogastric route, (ii) 49.2% of the infants were exclusively breastfed at hospital discharge, (iii) total duration of BMF was 7.38 ± 3.98 months, (iv) family-based peer lactation counseling has prolonged BMF interventions (8.47 ± 3.87 months), reduced the prevalence of formulary nutrition and the initiation of complementary foods before 6 months, (v) lactation counseling has extended breastfeeding beyond 6 months by 2.183 times (95% CI: 1.354–3.520).

Breast milk is the universally accepted source of nutrition for all infants.[16] Specific benefits for lower gestational infants include enhanced feeding tolerance and intestinal maturation, improved childhood growth, reduced necrotizing enterocolitis, and late-onset sepsis.[5] However, many preterm newborns fail to achieve their human milk feeding goals.[16,17] Prematurity-related health conditions, maternal disease or stress resulting in reduced milk expression, insufficient encouragement

[Downloaded free from http://www.jcnonweb.com on Saturday, May 15, 2021, IP: 88.241.48.74]

Table 1: The demographics of the study population

Perinatal data	Overall (*n*=358), *n* (%)	LCP delivery (*n*=190), *n* (%)	Non-LCP delivery (*n*=168), *n* (%)	*P*
Gestational age (weeks)*	32 (30-33)	31 (30-33)	32 (28-33)	0.195
Birth weight (g)*	1620 (1266.5-1840)	1666 (1350-1847)	1510 (1100.5-1838.75)	0.050
Male gender	189 (52.8)	102 (53.7)	87 (51.8)	0.720
CS delivery	335 (93.6)	175 (92.1)	160 (95.2)	0.228
Twin birth	44 (12.3)	16 (8.4)	28 (16.7)	0.018
Initial nutrition at NICU†	276 (77.1)	150 (78.9)	126 (75.0)	0.375
Mechanical ventilation	115 (32.1)	57 (30)	58 (34.5)	0.360
PDA	27 (7.5)	12 (6.3)	15 (8.9)	0.350
Sepsis	33 (9.2)	18 (9.5)	15 (8.9)	0.859
NEC	15 (4.2)	7 (3.7)	8 (4.8)	0.612
NICU-discharge weight (g)*	2240 (2140-2360)	2270 (2178.5-2360.5)	2212.5 (2100-2360)	0.018
Length of NICU stay (days)*	28 (20-40.25)	28 (22-38.25)	29 (18-42)	0.203

*Median (IQR); †Initial nutrition at NICU refers to the total sum of infants who delivered maternal milk by breastfeeding or orogastric route in the first day of life. NICU – Neonatal intensive care units; LCP – Lactation counselling program; IQR – Interquartile range; CS – Caesarean section; PDA: Patent ductus arteriosus; NEC: Necrotizing enterocolitis

Table 2: Sociocultural outcome of families

	LCP delivery	Non-LCP delivery	*P*
Family demographics (%)			
Elementary family	70 (36.8)	58 (34.5)	0.648
Extended family	120 (63.2)	110 (65.5)	
Number of siblings†	2 (1-2)	2 (1-2)	0.297
Maternal age (years)*	29.48±6.09	30.75±6.83	0.065
Maternal age category (years) (%)			
<25	39 (20.5%) [a]	41 (24.4%) [a]	0.038
25-40	144 (75.8%) [a]	111 (66.1%) [b]	
>40	7 (3.7%) [a]	16 (9.5%) [b]	
Maternal education status (%)			
Elementary	26 (13.7) [a]	20 (11.9) [a]	0.085
High school	103 (54.2) [a]	75 (44.6) [a]	
University degree	61 (32.1) [a]	73 (43.5) [b]	
Maternal working status (%)	94 (49.5)	108 (64.3)	0.005
Full time	44 (23.2) [a]	67 (39.9) [b]	0.002
Half time	50 (26.3) [a]	41 (24.4) [a]	
Housewife	96 (50.5) [a]	60 (35.7) [b]	
Maternal leave of absence (months)			
<3	11 (11.7)	16 (14.8)	0.496
3-6	53 (56.4)	52 (48.1)	
>6	30 (31.9)	40 (37)	
Paternal age*	33.96±5.62	35.11±6.51	0.072
Paternal education status (%)			
Elementary	18 (9.5) [a]	19 (11.3) [a]	0.077
High school	103 (54.2) [a]	71 (42.3) [b]	
University degree	69 (36.3) [a]	78 (46.4) [a]	
Family income (monthly), (%)			
Income<Expenses	58 (30.5) [a]	52 (31.0) [a]	0.065
Income=Expenses	99 (52.1) [a]	71 (42.3) [a]	
Income>Expenses	33 (17.4) [a]	45 (26.8) [b]	
Location of residency (%)			
Downtown	82 (43.2) [a]	83 (49.4) [a]	0.026
County	78 (41.1) [a]	47 (28.0) [b]	
Village	30 (15.8) [a]	38 (22.6) [a]	

*Mean±SD; †Median (IQR). LCP – Lactation counselling program; SD – Standard deviation; IQR – Interquartile range

[Downloaded free from http://www.jcnonweb.com on Saturday, May 15, 2021, IP: 88.241.48.74]

due to work-overload of the health-care staff are some of the confronting challenges.[16,17] Numerous research have demonstrated variable outcomes in breastfeeding prevalence of preterm infants of GA 32–34 weeks ranging between 27% and 87% (mean 59%).[6,18] Our observations were confirming the fact that Turkish people appraise breastfeeding as a natural nutrition source for infants.[9] It is very common in Turkey and the widespread use of maternal milk has ranked the country no. 7 with an average of 80/100 points among 98 countries.[9] However, EBF is not as widely practiced as recommended and is far from optimum in Turkey. The similar outcome was also evident in the current study; the practice of maternal milk at discharge (regardless of milk volume administered) was 90.2%. However, the incidence of exclusively-breastfed preterm infants has remained at 49.2% at NICU discharge and declined to 43% and 31.3% at 4 and 6 months. Only 17% of the preterm infants have continued BMF after 1 year. Global standards in breastfeeding is to achieve at least 80% of preterm and term infants to deliver exclusive breast milk throughout their hospital stay, continue EBF by at least 50% at 6 months and keep breastfeeding at 2 years or beyond.[3] Despite the society's positive attitude

Table 3: Correlation with breastfeeding length

	r	*P*
Gestational week	0.249	<0.001
Birth weight	0.366	<0.001
Timing of initial feeding at NICU	−0.116	0.014
Discharge weight	0.021	0.349
Length of NICU stay	−0.290	<0.001
Maternal age	−0.022	0.336
Paternal age	0.008	0.443
Siblings	0.110	0.019

NICU – Neonatal intensive care units

Table 4: Nutritional outcome after hospital dicharge

	Overall	LCP deliveries (*n*=190), *n* (%)	Non-LCP deliveries	*P*
Breastfeeding rate at discharge (%)*	323 (90.2)	170 (89.5)	153 (91.1)	0.611
EBF at discharge (%)	176 (49.2)	97 (51.1)	79 (47)	0.447
Length of BMF (months)†, ‡	7.38±3.98	8.47±3.87	6.15±3.75	<0.001
Complementary foods<6 months (%)	183 (51.1)	86 (45.3)	97 (57.7)	0.018
Nutrition at 4th month[a] (%)				
EBF at 4th month	154 (43)	89 (46.8)[a]	65 (38.7)[b]	0.120
BMF+milk fortifier	31 (8.7)	17 (8.9)[a]	14 (8.3)[b]	0.837
BMF+formula	138 (38.5)	64 (33.7)[a]	74 (44)[a]	0.044
Formula	35 (9.8)	20 (10.5)[a]	15 (8.9)[a]	0.611
Nutrition at 6th month[a] (%)				
EBF at 6th months	112 (31.3)	65 (34.2)	47 (28)	0.204
BMF+complementary foods	183 (51.1)	86 (45.3)	97 (57.7)	0.018
BMF+formulary	30	14 (7.4)	16 (9.5)	0.463
BMF+milk other than human milk	23	12 (6.3)	11 (6.5)	0.929
Formula	10	4 (2.1)	6 (3.6)	0.302
BMF at 12th month[a] (%)*	61 (17)	46 (24.2)	15 (8.9)	<0.001
Underlying reason of breastfeeding cessation (%)				
Lack of milk	249 (69.6)	120 (63.2)[a]	129 (76.8)[b]	0.019
İnfants unwillingness	86 (24)	56 (29.5)[a]	30 (17.9)[b]	
Medical obligation (drug usage, disease)	23 (6.4)	14 (7.4)[a]	9 (5.4)[a]	
Efficiency of lactation counseling (%)				
Very useful		118 (62.1)	-	
Efficient		56 (29.5)	-	-
Can be improvised		5 (2.6)	-	
Not efficient		11 (5.7)	-	
Paternal contribution (%)	227 (63.4)	136 (71.6)	87 (51.8)	<0.001
Level of paternal contribution				
Physical contribution at all times	109 (30.4)	62 (32.5)[a]	47 (28)[a]	<0.001
Physical contribution often	55 (15.3)	45 (23.7)[a]	10 (6.0)[b]	
No physical, but moral support	59 (16.4)	29 (15.3)[a]	30 (17.9)[a]	
No contribution at all	135 (37.7)	54 (28.4)[a]	81 (48.2)[b]	

*BMF rate refers to the total sum of maternal milk including "breastfeeding only," "mik+fortifier" and "milk+formulary;" †Mean±SD; ‡Months refer to the duration upon NICU discharge. NICU – Neonatal intensive care units; SD – Standard deviation; BMF – Breast milk feeding; LCP – Lactation counselling program; EBF: Exclusive breastfeeding

[Downloaded free from http://www.jcnonweb.com on Saturday, May 15, 2021, IP: 88.241.48.74]

Table 5: Logistic regression for breastfeeding interventions

Variables	OR	95% CI for EXP (B)		*P*
		Lower	Upper	
Lactation counselling	2.183	1.354	3.520	0.001
Working mother	0.510	0.309	0.842	0.009
Siblings	1.322	1.021	1.713	0.034
Introduction of complementary foods	0.964	0.594	1.565	0.882
Birth weight	1.002	1.001	1.003	<0.001

CI – Confidence interval; OR – Odds ratio

toward breast milk, bottle feeding, early introduction of other milks, and complementary foods are the common practices in Turkey.[9,19] Turkish Demographic Health survey has shown 40.7% of EBF prevalence in infants <6 months.[20] Moreover, 12% of babies receive complementary foods before 6 months.[9] The early introduction of complementary foods was much higher than the nation's statistics; 51.1% of the preterm infants have received semisolid/solid foods before 6 months. Reaching the global standards of at least 80% of the infants to receive breastmilk,[3] has eventually declined in time. These findings have confirmed the necessity of ongoing support following discharge.[1]

To ensure food security of the vulnerable infant, WHO and UNICEF have published ten steps to successful breastfeeding and launched BFHI worldwide to motivate nations to implement these steps in the early 1990s.[3] Since then, almost all countries in the world have implemented BFHI at some point. In respect, Turkish Ministry of Health complies with the regulations of international BFHI policies for over three decades.[9] As the number of BFHI centers increase, it is imperative to promote breastmilk for the critically-ill neonate who requires advanced neonatal care. Unfortunately, the concept of BFHI remains to be unsuited for many NICUs.[12] Several studies emphasize the great variability in breastfeeding practices and lactation counseling at NICU discharge for preterm infants.[4,6,7,13] A 2014 study investigating 6060 NICU nurses and 15.233 infants has shown only 14%–15% of the parents have received breastfeeding support in the NICU.[14] This scenario reflects the lower breastfeeding implementations in the preterm population.[17,21] Regarding this fact, BFHI has adapted the 10-step recommendations to NICU context to promote BMF in this population.[17] In respect to baby-friendly hospital requirements, each NICU are encouraged to establish their local protocols to support breastfeeding.[3] In 2017, the study center has adapted a contemporary peer-lactation counseling to all families of NICU admissions. The peer sessions have involved both parents and an accompanying elderly relative/caretaker who would assist the mother in neonatal care upon hospital discharge. The results of the present study have confirmed the positive impact on postdischarge nutrition outcomes. The odds of delivering LCP were 2.183 on extending breastfeeding beyond 6 months. The contribution of peer-counseling to infant feeding appears to be prolonging overall maternal milk administration to 8.47 ± 3.87 months, reducing the prevalence of formulary nutrition and initiation of complementary foods before 6 months. The topic of counseling is obscure due to opposing results in literature. Two studies have reported positive outcome in lactation counseling: Increased BMF both at hospital discharge and overall nutrition after discharge (from 23% to 37% and from 31% to 47%, respectively),[22] while Merewood *et al*. have shown the impact of peer counselors on postpartum 12 weeks as increased breastfeeding odds of 181%.[23] Conversely, in the randomized controlled study from Pinelli *et al*., no effect at breastfeeding duration in 1-year period.[24] Apparently, instead of increasing the EBF rates, the counseling sessions have their influence on overall breastfeeding interventions.

Three main categories have been identified in providing breastfeeding policies such as structural, settings, and individual factors.[13,25,26] The structural determinant is the sociocultural aspect that shapes the breastfeeding attitudes. Each community has its own interfamily dynamics and many individual and cultural factors are attributed to breastfeeding outcomes including maternal education, employment status, environmental conditions, and maternal psychological status.[21] Paternal involvement in NICU has a beneficiary effect in better breastfeeding exclusivity as well as improved cognitive functions and regular sleep patterns.[27] Participating the elderly relative to the counseling sessions might also influence the nutritional outcomes, because of their social influence, especially in the young, inexperienced mothers in our society. The lower practice of formulary feeding and complementary food before 6 months might reflect the higher maternal motivation by the other parent and the elderly relative. Family-centered approach involving both parents and the elderly relatives have also enabled enhanced maternal self-confidence for breastfeeding continuation.[19,28] Approximately ¼ of all mothers experience breastfeeding problems

[Downloaded free from http://www.jcnonweb.com on Saturday, May 15, 2021, IP: 88.241.48.74]

during the postpartum period. The rates are even much higher in mothers of preterm deliveries.[13] Despite the obstacles, mothers of preterm deliveries have stronger will to breastfeed their infants.[5] We assume the higher motivation of these mothers by family-centered peer counseling, professional support of the NICU staff and unit policies can help to overcome individual and social factors, while they increase the likelihood of improved breastfeeding outcomes.[13,29,30]

There were several limitations in the present study. More than 1/5 of the admissions were excluded from the study due to the failure of contact or other exclusion criteria. The retrospective design has led to potential risk of bias. The absence of maternal data including maternal morbidities, neighborhood characteristics, and feeding intervals was the other limitations preventing to examine individual and social factors. The challenges in breastfeeding are multifactorial and the social structure of each community defines the expectations in infant nutrition. Considering this fact, this comprehensive family-based lactation counseling was launched in respect with fulfill the need of the mothers of fragile infants. Higher maternal motivation by family-centered peer counseling and unit policies can overcome the obstacles and improve breastfeeding outcomes in preterm infants. The study outcomes were promising to see whether helping the preterm infant is not limited to delivering neonatal care at NICU, but sparing a little more time and effort of the health-care provider can contribute to reaching the nutritional goals and achieve long-term health benefits in this fragile population. Future multicenter research would address the impact of family-based counseling programs individualized to each community on multinational basis.

Conclusion

Appropriate nutrition with breastmilk in early childhood prevents future obesity and another noncommunicable disease that makes breastfeeding a public-health priority.[2] Despite the widespread efforts to implement the policies for more than three decades, many preterm infants fail to achieve their human milk feeding goals. Family-centered, peer counseling by NICU staff and increasing awareness for infant nutrition are promising local strategies in reaching the goals of national nutrition policies guided by the international recommendations in preterm infants.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Hilditch C, Howes A, Dempster N, Keir A. What evidence-based strategies have been shown to improve breastfeeding rates in preterm infants? J Paediatr Child Health 2019;55:907-14.
2. Bagci Bosi AT, Eriksen KG, Sobko T, Wijnhoven TM, Breda J. Breastfeeding practices and policies in WHO European region member states. Public Health Nutr 2016;19:753-64.
3. World Health Organization, United Nations Children's Fund. Section on Implementation guidance: Protecting, promoting and supporting breastfeeding in facilities providing maternity and newborn services: The revised baby-friendly hospital initiative 2018. Available from: https://apps.who.int/iris/handle/10665/272943. [Last accessed 2020 Mar 10].
4. Wilson E, Edstedt Bonamy AK, Bonet M, Toome L, Rodrigues C, Howell EA, *et al*. Room for improvement in breast milk feeding after very preterm birth in Europe: Results from the EPICE cohort. Matern Child Nutr 2018;14:e12485.
5. Parker MG, Melvin P, Graham DA, Gupta M, Burnham LA, Lopera AM, *et al*. Timing of first milk expression to maximize breastfeeding continuation among mothers of very low-birth-weight infants. Obstet Gynecol 2019;133:1208-15.
6. Mitha A, Piedvache A, Khoshnood B, Fresson J, Glorieux I, Roué JM, *et al*. The impact of neonatal unit policies on breast milk feeding at discharge of moderate preterm infants: The EPIPAGE-2 cohort study. Matern Child Nutr 2019;15:e12875.
7. Bonnet C, Blondel B, Piedvache A, Wilson E, Bonamy AE, Gortner L, *et al*. Low breastfeeding continuation to 6 months for very preterm infants: A European multiregional cohort study. Matern Child Nutr 2019;15:e12657.
8. Giannì ML, Bezze E, Sannino P, Stori E, Plevani L, Roggero P, *et al.* Facilitators and barriers of breastfeeding late preterm infants according to mothers' experiences. BMC Pediatr 2016;16:179.
9. World Breastfeeding Trends Initiative (WBTi). Section on Turkey Assessment Report (2015). Available from: https://www.worldbreastfeedingtrends.org/uploads/country-data/country-report/WBTi-Turkey-2015.pdf. [Last accessed on 2020 Mar 09].
10. World Health Organization, United Nations Children's Fund. Section on Global Strategy for Infant and Young Child Feeding. Geneva: 2003. Available form: http://apps.who.int/iris/bitstream/10665/42590/1/9241562218.pdf. [Last accessed on 2020 Mar 09].
11. World Health Organization. Section on National Implementation of the Baby-friendly Hospital Initiative, 2017. World Health Organization. Geneva. Available from: https://apps.who.int/iris/bitstream/handle/10665/255197/9789241512381.eng.pdf?sequence=1. [Last accessed on 2020 Mar 10].
12. Froh E, Dahlmeier K, Spatz DL. NICU nurses and lactation-based support and care. Adv Neonatal Care 2017;17:203-8.
13. Mitha A, Piedvache A, Glorieux I, Zeitlin J, Roué JM, Blondel B, *et al.* Unit policies and breast milk feeding at discharge of very preterm infants: The EPIPAGE-2 cohort study. Paediatr Perinat Epidemiol 2019;33:59-69.
14. Hallowell SG, Spatz DL, Hanlon AL, Rogowski JA, Lake ET. Characteristics of the NICU work environment associated with breastfeeding support. Adv Neonatal Care 2014;14:290-300.
15. Turkish Ministry of Health. Section on Baby FriendlyInitiative Program Further Recommendations for Neonatal Intensive Care Units. Available from: https://dosyahastane.saglik.gov.tr/Eklenti/147513,bebekdostuyenidoganyogunbakimlaricinbasarliemzirmedeekonerilerpdf.pdf?0. [Last accessed on 2020 Mar 09].

[Downloaded free from http://www.jcnonweb.com on Saturday, May 15, 2021, IP: 88.241.48.74]

16. Meier PP, Johnson TJ, Patel AL, Rossman B. Evidence-based methods that promote human milk feeding of preterm infants: An expert review. Clin Perinatol 2017;44:1-22.
17. Tambani E, Giannì ML, Bezze EN, Sannino P, Sorrentino G, Plevani L, *et al.* Exploring the gap between needs and practice in facilitating breastfeeding within the neonatal intensive care setting: An Italian survey on organizational factors. Front Pediatr 2019;7:276.
18. Bixby C, Baker-Fox C, Deming C, Dhar V, Steele C. A multidisciplinary quality improvement approach increases breastmilk availability at discharge from the neonatal intensive care unit for the very-low-birth-weight infant. Breastfeed Med 2016;11:75-9.
19. Karaçam Z, Sağlık M. Breastfeeding problems and interventions performed on problems: Systematic review based on studies made in Turkey. Turk Pediatri Ars 2018;53:134-48.
20. United Nations Children's Fund. Section on UNICEF data: Monitoring the situation of children and women. Access the data: Infant and young child feeding. Available from: https://data.unicef.org/topic/nutrition/infant-and-young-child-feeding/. [Last accessed on 2020 Mar 19].
21. World Health Organization. Section on Nutrition Global targets 2025. To improve maternal, infant and young child nutrition. Available from: http://www.who.int/nutrition/global-target-2025/en/. [Last accessed on 2020 Mar 13].
22. Gonzalez KA, Meinzen-Derr J, Burke BL, Hibler AJ, Kavinsky B, Hess S, *et al*. Evaluation of a lactation support service in a children's hospital neonatal intensive care unit. J Hum Lact 2003;19:286-92.
23. Merewood A, Chamberlain LB, Cook JT, Philipp BL, Malone K, Bauchner H. The effect of peer counselors on breastfeeding rates in the neonatal intensive care unit: Results of a randomized controlled trial. Arch Pediatr Adolesc Med 2006;160:681-5.
24. Pinelli J, Atkinson SA, Saigal S. Randomized trial of breastfeeding support in very low-birth-weight infants. Arch Pediatr Adolesc Med 2001;155:548-53.
25. Lubold AM. Historical-qualitative analysis of breastfeeding trends in three OECD countries. Int Breastfeed J 2019;14:36.
26. Rollins NC, Bhandari N, Hajeebhoy N, Horton S, Lutter CK, Martines JC, *et al*. Why invest, and what it will take to improve breastfeeding practices? Lancet 2016;387:491-504.
27. Clarkson G, Bc NN, Gilmer MJ, Dietrich MS, McBride BA, *et al*. Cross-sectional survey of factors associated with paternal involvement in the neonatal intensive care unit. J Clin Nurs 2019;28:3977-90.
28. Meedya S, Fahy K, Parratt J, Yoxall J. Supporting women to achieve breastfeeding to six months postpartum-The theoretical foundations of a successful program. Women Birth 2015;28:265-71.
29. Pérez-Escamilla R, Martinez JL, Segura-Pérez S. Impact of the baby-friendly hospital initiative on breastfeeding and child health outcomes: A systematic review. Matern Child Nutr 2016;12:402-17.
30. Macho P. Individualized developmental care in the NICU: A concept analysis. Adv Neonatal Care 2017;17:162-74.

Author Help: Reference checking facility

The manuscript system (www.journalonweb.com) allows the authors to check and verify the accuracy and style of references. The tool checks the references with PubMed as per a predefined style. Authors are encouraged to use this facility, before submitting articles to the journal.

- The style as well as bibliographic elements should be 100% accurate, to help get the references verified from the system. Even a single spelling error or addition of issue number/month of publication will lead to an error when verifying the reference.
- Example of a correct style
  Sheahan P, O'leary G, Lee G, Fitzgibbon J. Cystic cervical metastases: Incidence and diagnosis using fine needle aspiration biopsy. Otolaryngol Head Neck Surg 2002;127:294-8.
- Only the references from journals indexed in PubMed will be checked.
- Enter each reference in new line, without a serial number.
- Add up to a maximum of 15 references at a time.
- If the reference is correct for its bibliographic elements and punctuations, it will be shown as CORRECT and a link to the correct article in PubMed will be given.
- If any of the bibliographic elements are missing, incorrect or extra (such as issue number), it will be shown as INCORRECT and link to possible articles in PubMed will be given.

[Downloaded free from http://www.jcnonweb.com on Saturday, May 15, 2021, IP: 88.241.48.74]

Supplementary

Supplementary Table 1: Survey of nutrition outcome and breastfeeding practice of preterm infants upon hospital discharge

Survey (if applicable, can be marked more than one option)
1. Name-Surname: ……
2. Affiliation: ……
3. Education
a. Elementary school graduate
b. High school graduate
c. College graduate
d. University graduate
e. MBA, doctorate degree
4. Working status
a. Working part time/home office
b. Working full time
c. Not working at all
5. If working, when did you return to active working after birth?
6. Education status of the partner/wife/husband?
a. Elementary school graduate
b. High school graduate
c. College graduate
d. University graduate
e. MBA, doctorate degree
7. What is the monthly income ?
a. Income>Expenses
b. Income=Expenses
c. Income<Expenses
8. Location of residency ?
a. City downtown
b. Suburban/County
c. Village
9. Do you have any offsprings younger than 18 years?
10. What is the number of people (relatives) residing in the same location ? (please give precise number of family members)
a. Elementary family ……
b. Extended family ……
11. Have you ever concur any problems related to breastfeeding or infant nutrition upon hospital discharge? (Please write)
12. How long have you given breastmilk your infant (including breastfeeding, by cup, by bottle)
13. How long have exclusively breastfed your infant?
14. What was the route of breast milk delivery?
a. Breastfeeding
b. Bottle
c. Cup, spoon
d. The infant did not receive any breast milk
15. What are the reasons beneath the cessation of breast milk?
a. He/she quit breastfeeding
b. Cessation of milk after returning to work
c. Medically indicated milk cessation due to maternal disease/drugs
d. Medically indicated infant disease
16. Have you given any supplemental in addition to breastmilk in the first 6 months?
a. Milk fortifier
b. Formula
c. Milk other than maternal milk
17. What is the reason of administering supplemental foods (formula or milk other than human milk)?

Contd...

[Downloaded free from http://www.jcnonweb.com on Saturday, May 15, 2021, IP: 88.241.48.74]

Supplementary Table 1: Contd...

Survey (if applicable, can be marked more than one option)

a. Personnel belief of insufficient volume of breast milk and weight gain
b. Medically indicated formula due to retarded growth

18. When did you introduce complementary foods (semisolid/solid foods)?
19. Was there a regular family physician/pediatrician who followed the infant growth?
    a. Yes
    b. No
20. Have you received peer lactation counseling prior to hospital discharge?
    a. Yes
    b. No
21. Did you find the counseling program useful ? (If you answered 'YES' to the previous question, please rate the efficiency)
    a. Very efficient
    b. Efficient
    c. Can be improvised
    d. Not efficient at all
22. Please write down the reasons of program efficiency in daily nutrition?
    a. Physical contribution of the partner all the time
    b. Physical contribution of the partner often
    c. No physical, but moral support from the partner
    d. No contribution of the partner at all
    e. Physical contribution of the elderly?
    f. Moral support from the elderly
23. Please, add your comments to improve our daily practice in lactation counseling


Journal of Clinical Neonatology

Users Online: 309

About Us

About the Journal

The journal of Clinical Neonatology is a quarterly peer-reviewed international journal published in affiliation with the Saudi Neonatology Society. The journal's full text is available online. The journal allows free access (Open Access) to its contents and permits authors to self-archive final accepted version of the articles on any OAI-compliant institutional / subject-based repository. The journal does not charge for submission, processing or publication of manuscripts and even for color reproduction of photographs.

Abstracting and Indexing Information

The journal is registered with the following abstracting partners:
Baidu Scholar, CNKI (China National Knowledge Infrastructure), EBSCO Publishing's Electronic Databases, Ex Libris – Primo Central, Google Scholar, Hinari, Infotrieve, National Science Library, ProQuest, TdNet, Wanfang Data

The journal is indexed with, or included in, the following:
Emerging Sources Citation Index, Web of Science

Emerging Sources Citation Index

Journal Ethics

Wolters Kluwer and Journal/Association are committed to meeting and upholding standards of ethical behavior at all stages of the publication process. We follow closely the industry associations, such as the Committee on Publication Ethics (COPE), International Committee of Medical Journal Editors (ICMJE) and World Association of Medical Editors (WAME), that set standards and provide guidelines for best practices in order to meet these requirements. For a summary of our specific policies regarding duplicate publication, conflicts of interest, patient consent, etc., please visit www.Medknow.com/EthicalGuidelines.asp

Open Access Publication and Creative Commons Licensing

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Digital Archiving

Wolters Kluwer Medknow provides for long-term digital preservation through two primary partnerships, Portico and CLOCKSS.

Portico is a leading digital preservation service worldwide. The content is preserved as an archival version and is not publically accessible via Portico, but is provided when required under specific conditions, such as discontinuation of the collection or catastrophic failure of the website.

CLOCKSS will enable any library to maintain their own archive of content from Wolters Kluwer Medknow and other publishers, with minimal technical effort and using cheaply available hardware.

Ahead of Print policy

Articles published online under the Ahead of Print model are considered published and can be cited and quoted using the DOI as the reference source. Wolters Kluwer Medknow has a policy that changes will not be made after publication of an article without following accepted procedures for making corrections to the scientific record.

Advertisements

While advertisements are crucial to this journal to be able to keep all content free for everyone, ethical considerations are in place to ensure the integrity of the journal and its content:

- "Pop-up" and "banner" ads appear on a random, rotating basis. The advertiser has no control or input over the pages where their ads appear.
- The Editorial Board has full and final approval over the content of all advertisements.
- Advertisers will never be shown any manuscripts or other content prior to publication.

Scope of the journal

The JCN publishes original articles, clinical reviews and research reports which encompass both basic science and clinical research including randomized trials, observational studies and epidemiology.

Medknow Publications

Feedback
Subscribe
Editorial board
Subscribe to this journal
Submit article
Most popular articles
Join as Reviewer
Email alerts
Recommend this journal to your library or friends

Medknow, part of Wolters Kluwer Health, is one of the largest open access publishers worldwide with more than 450+ medical journals in its portfolio. Students, researchers, clinicians and other healthcare professionals worldwide access Medknow journals to help them fuel new discoveries and improve patient care.

Founded in 1997, Medknow is a well-respected medical publisher that fully supports many of the popular open access models through its peer-review management system. Medknow's open access policy has resulted in more than a half a million article downloads monthly for all of its journals.

Wolters Kluwer Health (Philadelphia, PA) is a leading global provider of information, business intelligence and point-of-care solutions for the healthcare industry. Serving more than 150 countries and territories worldwide, Wolters Kluwer Health's customers include professionals, institutions and students in medicine, nursing, allied health and pharmacy. Major brands include Lippincott Williams & Wilkins, Ovid®, UpToDate®, Medi-Span®, Facts & Comparisons®, Pharmacy OneSource®, Lexicomp® and ProVation® Medical. Wolters Kluwer Health is part of Wolters Kluwer, a market-leading global information services company with annual revenues (2011) of €3.4 billion ($4.7 billion), approximately 19,000 employees worldwide and operations in over 40 countries across Europe, North America, Asia Pacific, and Latin America.

Medknow Specialties

Online and Print Scholarly Publishing, Peer-Review System, Specialized in Medical Research, Largest Open Access Publisher

Sitemap | What's New | Feedback | Disclaimer|
© Journal of Clinical Neonatology | Published by Wolters Kluwer - Medknow
Online since 30 April, 2011

Users Online: 311

Feedback
Subscribe
About the journal
Subscribe to this journal
Submit article
Most popular articles
Join as Reviewer
Email alerts
Recommend this journal to your library or friends

Editorial Board

FOUNDER

Saleh Al-Alaiyan

EDITOR IN CHIEF

Saad Alsaedi

ASSOCIATE EDITORS

Sameer Al-Abdi

Sajjad ur Rahman

MANAGING EDITOR

Taha Inam

BIOSTATISTICAL EDITOR

Mohamed Shoukri

NATIONAL EDITORS

Abdullah AlHerbish

Fahad Al-Hazzani

Saud Al-Shanafey

Abdullah AlSalloum

Majid Al-Fayyadh

Zakariya Al-Salam

Nawaf AlDaajani

Jubara Alallah

Abdulrahman Al-Zahem

Rafat Mosalli

Abbas AlOmran

Esam Albanyan

Wesam Kurdi

Sami Alhaider

Mansoor Alqurashi

Heidi Al-Wassia

INTERNATIONAL EDITORS

- ***Canada***

  Patrick McNamara

- ***United States***

  Martin Keszler

  Vinod K.Bhutani
  Hani Ali

  Khalid Haque

- ***Europe***

Maximo Vento (Spain)
David Millar (UK)
Paolo Manzoni (Italy)
Sunil Sinha (UK)

Anne Greenough (UK)

- ***Australia***
Martin Kluckow
- ***India***
Nandikishor Kabra
- ***Singapore***
Selina Ho Kah Ying
-
- ***Jordan***
Mohammad Khassawneh
- ***UAE***
Alaa Eldemerdash

Laila Obaid

- ***Turkey***
Murat Yurdakök

© Journal of Clinical Neonatology | Published by Wolters Kluwer - Medknow
Online since 30 April, 2011

Want to receive updates from select journals, publishers and organizations; including call for papers, curated articles, new journal & book updates, and conference & events updates?

Dismiss Subscribe

Already have a manuscript?

Use our Manuscript Matcher to find the best relevant journals!

Find a Match

Filters

Clear All

- *Web of Science* Coverage
- Open Access
- Category
- Country / Region
- Language
- Frequency
- Journal Citation Reports

Refine Your Search Results

journal of clinical neonatology

Search

Sort By: Relevancy

Search Results

Found 3,947 results (Page 1) Share These Results

Exact Match Found

JOURNAL OF CLINICAL NEONATOLOGY

Publisher: WOLTERS KLUWER MEDKNOW PUBLICATIONS , WOLTERS KLUWER INDIA PVT LTD , A-202, 2ND FLR, QUBE, C T S NO 1498A-2 VILLAGE MAROL, ANDHERI EAST, MUMBAI, INDIA, 400059

ISSN / eISSN: 2249-4847 / 1658-6093

Web of Science Core Collection: Emerging Sources Citation Index

Share This Journal View profile page

** Requires free login.*

Other Possible Matches

Our policy towards the use of cookies

All Clarivate websites use cookies to improve your online experience. They were placed on your computer when you launched this website. You can change your cookie settings through your browser.

Ok to Continue

Cookie Policy