

Breastfeeding in Neonatal Intensive Care Unit of Casablanca Teaching Hospital Ibn Rochd

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Abstract

Objective: This study aimed to estimate the prevalence and identify the associated factors of breastfeeding (BF) practice in the NICU of Casablanca Ibn Rochd teaching hospital.

Method: A cross-sectional study was performed between 04 January and 26 June 2021 in NICU. Moroccan couples' mother/newborn were consecutively recruited after meeting the study inclusion criteria. We used face-to-face interviews using a pretested questionnaire. Our income variable was the proportion of mothers who exclusively or partially breastfed at least one time after admission, categorized by yes and no. Multiple binary logistic regression was used to test the association of income variable with predictors.

Findings: We included 170 couple mother/newborn. Around 74% of mothers practiced partial breastfeeding. The mother factors associated with BF practice were: education level (OR=0,10; 95%CI : 0,01-0,87; p=0,037781), family monthly income (OR=4,3 ; 95%CI: 1,12-16 ,56 ; p=0,033606) and marital status (OR=14,3 ; 95%CI:1,37-148,43 ; p=0,025853). The newborns' factors associated to BF practice were: hospital stay length (OR= 1,12 95%CI: 1,00-1,25 ; p=0,047726) and Hospitalization motif (OR=0,27 ; 95%CI: 0,076-0,95 ; p=0,042085). And healthcare facility factors associated to BF practice was: healthcare staff support: (OR=6,7 ; 95%CI:2,2-20,54 ; p=0,000891).

Conclusion: The newborns hospitalized for respiratory distress from single mothers with lower education levels and social standards who did not have enough (or any) support from healthcare staff were the ones who received less breast milk in the NICU of Casablanca Ibn Rochd teaching hospital.

Introduction

Breastfeeding (BF) can avoid globally per year 800000 under 5 years old infants death, 20000 breast cancer cases. Reversely, stopping BF can cost 300 billion US dollars per year. The world health organization (WHO) recommends exclusive breast milk feeding immediately after delivery till 6 months then the introduction of others foods with BF till at least 2 years [1]. BF is an important part of motherhood; mothers who have their baby hospitalized in a neonatal intensive care unit (NICU) can not play fully their motherhood as traditionally. They are more often separated from their baby; their mother's care is replaced by healthcare with healthcare staff more focused on the administration of medication doses and checking baby constants. Most of the time the babies are connected to monitors or life-saving devices which can be intimidating for new parents. The new mothers are also intimidated by the immaturity and fragility of their infants. The NICU constitutes a real challenge for the BF. The BF rate is lower in the NICU. In USA the breast milk feeding rate is 71,4% and 50% in NICU [2, 3]. In China, the rate of BF is around 42% and 23% in the neonatology ward [4, 5]. In Denmark, the BF initiation rate is 99% and 65% in NICU [6]. The papers about breastfeeding in NICU are scarce in the African continent. In Morocco, the prevalence of exclusive breastfeeding (EBF) decreased from 51% in 1992 to 35% in 2018. This prevalence was lower in NICU with 12.4% in 2014 [7–9].

This study aimed to estimate the prevalence and identify the associated factors of breastfeeding (BF) practice in the NICU of Casablanca Ibn Rochd teaching hospital.

Method

Study design and setting

A cross-sectional study was performed between 04 January to 22 June 2021 in the neonatal intensive care unit (NICU) of teaching hospital Ibn Roch of Casablanca (Morocco). The NICU capacity was 22 beds and hospitalized monthly around 100 patients.

Study population

This study considered all mothers who had newborns hospitalized in the NICU ward of teaching hospital Ibn Roch of Casablanca during the study period. We included any couple mother/newborn that could practice breastfeeding. We excluded any couple mother/newborn that had any BF counter indication, no Moroccan mother, couples mother/newborn rehospitalized, or absents in the study period.

Sampling

Sample size determination

The sample size was determined using a single population proportion formula assuming an expected rate for exclusive breastfeeding in a previous survey conducted in Morocco to be 12,4% [10] with a 95% confidence level, at a 5% margin of error. The calculated sample size using the above assumptions became 162.

$$n= P (1-P) \frac{z\alpha^2}{I^2}$$

Sampling procedure

During the period of this study, the monthly admission to NICU was around 100, we included randomly between 5 and 10 couples mother/newborn per week.

Recruitment and data collection procedure

Given the absence of a validated standardized instrument, the questionnaire used in the present study was adapted from literature and similar studies that were conducted in Morocco [7, 9]. The content was validated by a panel of national experts (neonatology and public health professors). The pilot study was conducted among 20 post-partum mothers in the maternity ward of Ibn Rochd teaching hospital. The resulting questionnaire contained a total of 37 questions distributed in 05 dimensions that addressed; the socioeconomic-obstetric (09 questions), BF practice and supports (04 questions), BF knowledge (16 questions), BF information (04 questions), and newborn characteristics (04 questions).

The mothers were approached to introduce the study by giving them all the necessary information (purposes, investigators, benefits, risks, anonymity, confidentiality, and data protection) and seeking their consent to participate. In a secluded area at the NICU, a questionnaire was administered face-to-face in the local dialect by authors (4th, 5th, and 6th), to the mothers who consented verbally to participate. All data collection procedures were carried out within 15–20 minutes.

Operational definitions:

Exclusive breastfeeding (EBF): The newborn received only breast milk from his/her mother or a wet nurse for the first 6 months and no other solids or liquids except for drops or syrups consisting of vitamins, minerals.

Partial breastfeeding or mixed feeding: The newborn received some breastfeeds and some artificial feeds either milk or cereal, or other food or water

Artificial feeding: the newborn received breast- milk substitutes and no breastfeeding at all.

Variables

Outcome

BF Practice: it was the proportion of mothers who exclusively or partially breastfed at least one time after admission. This was categorized into "Yes" for mothers who breastfed exclusively or partially at least one time after admission and "No" for mothers that did not breastfeed.

Determinants:

Socio-obstetric characteristics of mothers: age in year. The residence was categorized as urban, and rural. The education level was ordered as unschooled, primary school, secondary school, and upper/university. The matrimonial status was grouped as single, widow, married, and divorced. Profession categorized as household wife, self-employed, paid worker. Family monthly income in euro ordered as low (< 300 euro), middle (300–700 euro), and high (> 700 euro). The number of prenatal visits and number of children alive. BF knowledge score from answers to 16 questions (good answer = 1 and other answer = 0) about benefits, kangourou, initiation, diversification, expression, and conservation of breast milk.

Supports during hospitalization: The healthcare staff support was classified as yes and no. The relatives' support was arranged as yes and no.

Prior council or information about BF was categorized as yes and no.

Information sources about BF: media categorized as yes and no. healthcare staff grouped as yes and no. Relatives were categorized as yes and no

Newborn characteristics: gestational age in week of amenorrhea categorized as < 28, 28–32, 32–37, > 37. Gender categorized as (male, female). Reasons for hospitalization grouped as respiratory distress, infections, jaundice, and others. Hospital stays in the number of days and weight in kilogram.

Data Analysis

Data analysis was performed by R software version 3.6.3 (package Rcmdr).

Percentages (frequencies), median (with interquartile range) were used to describe the study population.

The multiple binary logistic regression model was used to analyze the association between potential determinants and outcome (BF practice = yes and no), using stepwise model selection backward/forward on Bayesian information criterion (BIC). The determinants with a p-value of 0.05 in multivariate analysis were considered as determinants associated significantly with the BF practice.

Results

Descriptions of the couple's mother/newborn:

We included 170 couples and one mother declines our request for participation. The mothers' median age was 29 years old (with 10 years as the interquartile range). About 63% of mothers lived in an urban area. Primary school was the education level for 37% of mothers. Mothers who had over one living child represented 63.1%. Over 80% of mothers started BF 12 hours after delivery. The median score of BF knowledge was 10 with 3 as the interquartile range. The prevalence of partial breastfeeding was about 74% with 95%CI [67% – 80%] (prevalence of artificial feeding was around 26%) and none of the mothers practiced exclusive breastfeeding. Over 53% of mothers received healthcare staff support about BF practice. Respiratory distress was the hospitalization reason in 55.29% of cases. Almost 55% of the newborn were males (See Tables 1 and 2 for more details).

Table 1
Description of the couples' mother/newborn

Characteristics	frequency (percentage)	Median (interquartile range)
Mothers' characteristics		
Age (year)		29 (10)
Residence		
Rural	63(37.06)	
Urban	107 (62.94)	
Education level		
Unschoolled	41(24.12)	
Primary	63(37.06)	
Secondary	55(32.35)	
upper/university	11 (6.47)	
Marital status		
Single	7 (4.12)	
divorced	1 (0.59)	
Married	162(95.29)	
Profession		
Household wife	152(89.94)	
Paid worker	10 (5.92)	
self-employed	7 (4.14)	
Family monthly income (euro)		
<300	135(79.88)	
300–700	32(18.93)	
>700	2 (1.18)	
Number of prenatal visit		4 (3)
Number of living child		
1	62(36.69)	
> 1	107(63.31)	
Delivery mode		

Characteristics	frequency (percentage)	Median (interquartile range)
Vaginal delivery	99(58.24)	
caesarian	71(41.76)	
Newborns' Characteristics		
Gender		
Female	73(45.06)	
Male	89(54.94)	
Gestational age (week of amenorrhea)		
< 28	1 (0.64)	
28–32	17(10.90)	
32–37	64(41.03)	
> 37	74(47.44)	
Hospital stay length		6 (6)
Hospitalization motif		
respiratory distress	94(55.29)	
infections	19(11.18)	
jaundice	13 (7.65)	
others	44(25.88)	

Table 2
Description of BF practice

Characteristics	Frequency (percentage)
BF practice	
Yes	125(73.96)
No	44(26.04)
BF Initiation after delivery	
< 1 hour	16(10.26)
1–12 hours	15 (9.62)
> 12 hours	125(80.13)
Healthcare staff support	
Yes	86(53.01)
No	78(46.99)
Relatives support	
Yes	153(92.17)
No	13 (7.83)
Prior Information/council about BF	
Yes	156(93.41)
No	11 (6.59)
Sources of information about BF	
media	
Yes	83(49.7)
No	84(50.3)
Healthcare staff	
Yes	55(32.93)
No	112(67.07)
Family/Friends	
Yes	135(80.84)
No	32(19.16)

Associated factors to breastfeeding practice:

The associated factors to BF were: mothers' education level, family monthly income, marital status, healthcare staff support, prior council, or information about BF. Newborns' hospitalization motif and length of hospital stay. (See Table 3 for more details)

Table 3
Associated factors with BF practice in NICU

<i>Factors</i>	BF practice		<i>OR</i>	<i>95%CI OR</i>	<i>P value</i>
	Yes n(%)	No n(%)			
Mothers					
Median age (year)	28.0	29.5	1.03	[0.94–1.13]	0.546370
Residence					
Rural	42(66.7)	21(33.3)	1		
Urban	84(78.5)	23(21.5)	2.31	[0.81–6.61]	0.118188
Education level					
Unschoolled	30(73.2)	11(26.8)	1		
Primary	46(73.0)	17(27.0)	0.81	[0.23–2.83]	0.737912
Secondary	43(78.2)	12(21.8)	0.67	[0.14–3.06]	0.605550
Upper/university	7(63.6)	4(36.4)	0.10	[0.01–0.87]	0.037781 *
Marital Status					
Single	3(37.5)	5(62.5)	1		
Married	123(75.9)	39(24.1)	14.3	[1.37-148.43]	0.025853 *
Family monthly income (euro)					
<300	98 (72.1)	38 (27.9)	1		
>=300	28 (82.4)	6(17.6)	4.3	[1.12-16 .56]	0.033606*
Delivery mode					
Vaginal delivery	72 (72.7)	27 (27.3)	1.74	[0.611-5.0]	0.298328
Caesarian	54 (76.1)	17 (23.9)	1		
Median Knowledge Score	11	10	1.1	[0.88-1,37]	0.399078
Median number of living child	2	2	1.07	[0.62–1.82]	0.809710
Healthcare staff support					
Yes	74(85.1)	13(14.9)	6.7	[2.2-20.54]	0.000891*
No	52 (62.7)	31 (37.3)	1		
Prior information or council about BF					
Yes	121(76.1)	38(23.9)	2.9	[0.3-28.76]	0.361193

<i>Factors</i>	BF practice		<i>OR</i>	<i>95%CI OR</i>	<i>P value</i>
	Yes n(%)	No n(%)			
No	5(45.5)	6(54.5)	1		
Newborns' characteristics					
Median gestational age	37.0	35.5	1.12	[0.89–1.40]	0.322981
Reasons of hospitalization					
Respiratory distress	63(67.0)	31(33.0)	0.27	[0.076-0,95]	0.042085*
Infections	17(89.5)	2(10.5)	3.2	[0.34–29.88]	0.306386
Jaundice	11(84.6)	2(15.4)	1,12	[0.13–9.39]	0.913304
Others	35(79.5)	9(20.5)	1		
Hospital stay length(median day)	7	4	1,12] 1.00-1.25]	0.047726*

Discussion

In Our study the prevalence of partial breastfeeding was about 74% with 95%CI [67% – 80%] and none of mothers practiced exclusive breastfeeding. The BF practice was associated to mothers' education level (OR = 0.10; 95%CI : 0.01–0.87 ;p = 0.037781), family monthly income (OR = 4.3; 95%CI:1.12-16 .56 ; p = 0.033606), marital status(OR = 14.3;95%CI:1.37-148.43; p = 0,025853), healthcare staff support (OR = 6.7 ; 95%CI :2.2-20.54 ; p = 0.000891), hospitalization motif (OR = 0.27 ; 95%CI : 0.076–0.95 ; p = 0.042085) and hospital stay length (OR = 1.12 95%CI : 1.00–1,25 ; p = 0.047726).

The studies performed in Egypt, 2008 [13], Spain, 2020 [14], the US, 2006 [15], and the UK, 2017 [16] also found that mothers supported by healthcare staff practice BF significantly more than the mothers not supported. The studies were done in Finland, 2018 [17], Denmark, 2010 [18], and the US, 2011,[19] showed as well mothers from lower socioeconomic status breastfed less than their newborns compared to the ones from a higher class. Our study and the one of the US, 2011[19] found that married mothers breastfed significantly more compared to single ones. The survey conducted in Finland, 2016 [20] concluded that mothers with higher education level initiated BF earlier than lower level (median of postnatal age of breastfeeding initiation, but in our study, we found that higher education level mothers breastfed least; this could be explained by the fact most higher-level educated mothers had an occupation. The studies in Austria, 2009[22] and Ethiopia, 2020[21] showed newborns with long hospital stay lengths received significantly less breast milk whereas our survey found that longer hospital stay lengths coincide significantly with better BF practice; this could be explained by the fact most of the mothers had already initiated breastfeeding before their admission and restarted progressively to breastfeed later in NICU. The studies carried out in Finland, 2018 [17] and 2016 [20] found a significant association between newborn gestational age and BF practice while in our study there was no significant

relationship between them like the surveys in Denmark, 2010 [18] and Ethiopia, 2020[21]. The study performed in Egypt, 2008 [13] showed mothers with higher knowledge scores about BF practiced more, however, in our study, we didn't find any significant association between BF knowledge and BF practice like the one performed in China, 2018 [23]. Our study found a significant association between newborn hospitalization motif and BF practice but this association was not confirmed in any paper

Strength and limits: This study was one of the firsts studies that got interested in breastfeeding during hospitalization in neonatal intensive care in Morocco. The bias related to a face-to-face interview and the mono-centric aspect can limit the range of this study's results.

Conclusion

The newborns hospitalized for respiratory distress from single mothers with lower education levels and income, who didn't have enough (or any) support from healthcare staff were the ones who received less breast milk in the NICU of Casablanca teaching hospital Ibn Rochd. So this study suggests these couples' newborns/mothers should get more attention from healthcare staff and training programs about breastfeeding in NICU.

Declarations

Acknowledgments

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Ethical Approval

The study was approved by the Review Board of Research Ethics of Neonatal medicine and resuscitation service of Casablanca teaching hospital Ibn Rochd (RENr; Rec- 28.12.2020).

Consent to participate Informed

The consent was obtained from all participant involved in the study.

Consent for publication

Not applicable.

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Competing interests

The authors declare no competing interests.

Authors' Contribution

Author 1: drafting of protocol and manuscript, data collecting tool designing, and data analysis. **Author 2:** raising the issue, reviewing of protocol and manuscript, data collecting tool expertise. **Author 3:** data collecting tool content validation, data collecting. **Author 4:** data collecting. **Author 5:** data collecting. **Author 6:** data collecting. **Author 7:** data collecting tool content expertise. **Author 8:** data collecting tool content expertise and data collecting supervision. **Author 9:** data collecting tool content expertise and data collecting supervision. **Author 10:** reviewing of protocol and manuscript **Author 11:** data collecting tool designing, reviewing of protocol and manuscript.

Availability of data and materials

All data generated or analyzed during this study are included in this paper. Authors will satisfy any reasonable request for materials, methods, or data necessary to reproduce or validate the study findings.

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