






BMJ Open Correlates of early initiation of breast feeding and prelacteal feeding: a cross-sectional study in Sindh province of Pakistan

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ABSTRACT

Objectives The objective of this study was to determine the prevalence and correlates of early initiation of breast feeding and prelacteal feeding in highly disadvantaged districts in Pakistan.

Design This cross-sectional study design.

Settings This study was carried out in twelve districts of the Sindh province of Pakistan.

Participants A total of 4800 mothers with children under 2 years, selected through a multistage random sampling method.

Data analysis Bivariate association, survival analysis (Kaplan-Meier and Cox proportional hazard techniques), multivariate linear regression and the ordinary least square model were used.

Results The results show that the prevalence of early initiation of breast feeding was 68% and prelacteal feeding was 32%. Adequate treatment, proper guidance at antenatal care visits, postpartum health check, normal birth with skilled birth attendants, institutional birth, skin-to-skin contact at birth and birth size were all associated with early breastfeeding initiation ($p < 0.001$). The odds of early initiation of breast feeding after birth are higher if the respondents received proper guidance (OR 2.05; 95% CI 1.02 to 4.11) or made skin-to-skin contact (OR 10.65; 95% CI 6.82 to 16.65). Bivariate association between the prelacteal feeding and a set of correlates suggests that all variables under study were significantly associated with the outcome variable of interest at a 95% or higher significance level. The factors which significantly reduced the odds of prelacteal feeding were adequate treatment (OR 0.29; 95% CI 0.23 to 0.37) and postpartum health check (OR 0.65; 95% CI 0.53 to 0.80).

Conclusion Study concludes that the correlates like adequate treatment of mothers during labour, postpartum health check-up, normal birth with skilled birth attendants, institutional births and skin-to-skin contact between mother and the baby determine the early initiation of breast feeding and prelacteal feeding. Early initiation of breast feeding needs to be encouraged, and communities must be educated against the use of prelacteal feeding.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The major strength of this study is that it employs a large and community representative sample size from twelve districts, and the findings of this study can be generalised to the rest of the rural districts of Pakistan.
- ⇒ This cross-sectional study has explored different correlates of breast feeding and prelacteal feeding in rural areas of Sindh Pakistan.
- ⇒ Prelacteal feeding practice was common in our study participants, which may have negatively impacted neonatal health.
- ⇒ We collected data from mothers who had less than 2 years of children because such respondents may have better recall of prelacteal and early initiation breastfeeding practices that have rarely been reported in previous research.
- ⇒ Anthropological and clinical variables such as local customs, premature delivery, postpartum haemorrhage, gestational diabetes mellitus, etc, were not included in the current study.

INTRODUCTION

The WHO recommends initiating breast feeding within the first hour of birth and exclusive breast feeding for the first 6 months of life, meaning no other foods or liquids should be introduced to the infant during that time.^{1,2} However, delayed early initiation of breast feeding and giving prelacteal feeding to newborns is a common practice in Pakistan. Breast feeding is a critical child survival strategy that can reduce up to 55%–87% of infant morbidity and mortality³ and prevent infectious diseases like diarrhoea, pneumonia, neonatal sepsis and meningitis.^{4–6}

The delayed initiation of breast feeding and prelacteal feeding can compromise colostrum feeding, which is rich in antibodies and essential nutrients, providing natural protection to newborns against infections

during the post-partum period and afterward.⁷ Early breast feeding has its advantages as the newborns who are breastfed early are also less likely to receive prelacteal feed and have a longer duration of breast feeding.⁸ About 65% of newborns receive prelacteal feed in Pakistan, consisting of honey, water, ghee, rosewater, animal milk or other alternatives to breast milk.⁹ The prevalence of prelacteal feeding is higher in Pakistan as compared with neighbouring countries, that is, 21% in India,¹⁰ 27% in Bangladesh¹¹ and 43% in Afghanistan.¹²

Early initiation of breast feeding benefits the newborn and helps prevent postpartum haemorrhage by inducing uterine contractions. It also has a role in reducing the risk of premenopausal breast and ovarian cancers.¹³ Delayed breast feeding is linked with higher newborn mortality.¹⁴ A study showed that newborns breastfed after more than 24 hours post birth carried 85% higher risk of death than those breastfed within 24 hours of birth.¹⁵ Additionally, early initiation of breast feeding alone can reduce the risk of all-cause neonatal mortality by 46%.¹⁶

Moreover, early initiation of breast feeding encourages skin-to-skin contact between mother and newborn, creating a warm bond between them.¹⁷ A national survey of Pakistan reports that 80% of women delay early initiation of breast feeding in Pakistan—which is the lowest in the region.¹⁸ Early initiation of breast feeding is often purposely delayed by mothers to perform various cultural and religious rituals known as prelacteal feeding in most low-income and middle-income countries (LMICs).¹⁹

Prelacteal feeding is the major determinant of delaying the early initiation of breast feeding and significantly increases the newborn's exposure to a wide range of risks, despite the recognition that early initiation of breast feeding and exclusive breast feeding are critical to the newborn's survival. However, previous studies have scarcely explored the determinants of both early initiation of breast feeding and prelacteal feeding in extremely disadvantaged areas of Pakistan.^{9–13} Hence, this study explores the correlates of early initiation of breast feeding and prelacteal feeding among mothers in predominantly rural districts of Sindh province, Pakistan, where the newborn morbidity and mortality indicators have been very high. This study may help public health authorities implement targeted strategies to improve early initiation of breast feeding and discourage prelacteal feeding in Pakistan and other similar settings.

METHODS

Study design, participants and settings

This cross-sectional study was conducted in 12 out of 29 districts in Sindh—a southern province of Pakistan. These districts were selected based on poor maternal and child health indicators according to a ranking based on the Multiple Indicator Cluster Survey.²⁰

Assuming a confidence level of 95%, an SE of 5%, and taking a prevalence of Emergency Obstetric and Newborn Care of 50%, a sample size of 384 was estimated which was

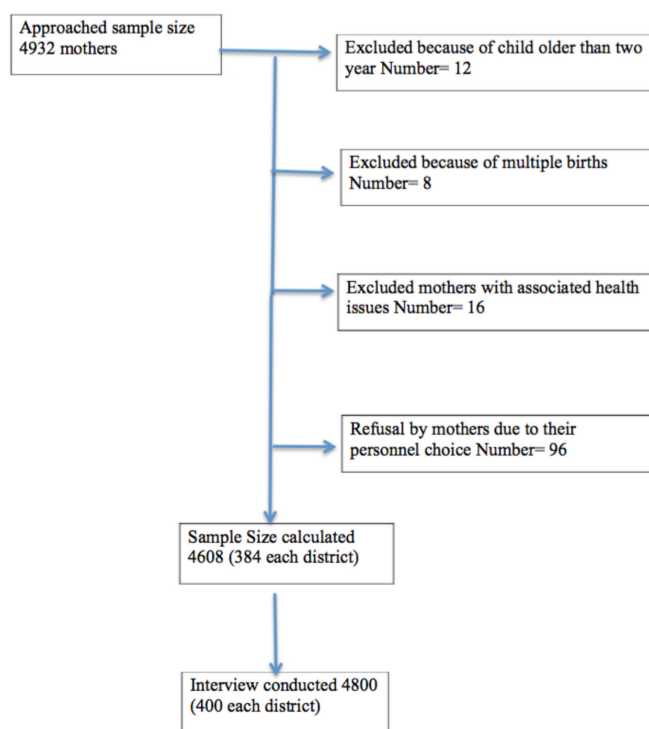


Figure 1 Sampling selection process.

rounded to 400. Hence, 4800 mothers were expected to be interviewed in the study from 12 districts of the province. The women with underlying health conditions such as chronic diseases, terminal illness, twin pregnancies and having a child older than 24 months were excluded from this study (figure 1).

Multistage cluster random sampling technique was used to select participants from the selected districts. Initially, a union council (one of the smaller administrative units in a district) was selected as a cluster from among the 40 union councils in each district (primary sampling units) through simple random sampling. In the next stage, 10 houses were randomly selected from each union council to select eligible participants. The Lady Health Workers of the area identified these houses. Mothers of children under 2 years of age were our primary respondents, who were interviewed in their homes using a structured pilot-tested questionnaire. A team of data collectors was trained, and the principal investigator ensured the quality of data collection by randomly validating the household questionnaires. The final sample size of this study, after excluding some cases, was 4800. The response rate was high in this study (98%) since we used the sampling frame provided by local Lady Health Workers, and the data were collected by the trained staff.

A structured questionnaire was developed by reviewing the relevant literature considering the objectives of the study.^{13,16} Moreover, the WHO tool for assessing infant and young child feeding practices was adapted and used after pretesting in neighbouring districts.²¹ The questionnaire was pilot tested with 143 respondents before final data collection. After pilot testing, the sequence of the questionnaire was modified, and repetitive and unnecessary

questions were omitted. The trained research staff, with at least graduate level education (14 years), collected data by interviewing the mothers of children under 2 years of age residing in the community from January to October 2019. The data were entered in Microsoft Excel, validated and double-checked by the supervisor and data manager. We used Stata V.17 MP and R software for further analysis.

Variables

Two outcome variables were included in this study: early initiation of breast feeding and prelacteal feeding. The early initiation of breast feeding was constructed as a binary variable labelled 'yes' if a child was breastfed within 1 hour after birth and 'no' otherwise. The prelacteal feeding variable (categorical, yes/no) was constructed by aggregating several questions based on the mother's account of feeding the infant in the first 3 days after delivery. Additionally, seven independent variables were included in this study. Adequate treatment means the health professionals provided appropriate medical care to the respondent at the time of her delivery. The adequate treatment variable was constructed from three related questions asked from the respondent: (1) did the respondent deliver at the hospital? (2) was the delivery performed by the trained /skilled health professional? and (3) was she satisfied with the quality of healthcare at the time of delivery? If the answer of the respondent to *all* three questions was 'yes', we recorded it as 'adequate treatment' and 'not adequate treatment' otherwise. Similarly, proper guidance means correct information provided to the respondent during pregnancy by healthcare providers. The proper guidance variable was constructed from two questions: (1) did the respondent receive at least four antenatal care (ANC) visits as per the WHO recommendations during the pregnancy? and (2) did the respondent received counselling by the health providers on the advantage of early initiation of breast feeding and disadvantages of prelacteal feeding during the pregnancy? If the respondent answered 'yes' to both the questions, we coded it as 'women received proper guidance during the pregnancy' and 'she did not receive proper guidance' otherwise. Several covariates, including postpartum health check (categorical), mode of delivery (categorical), place of delivery (categorical), skin-to-skin contact (categorical) and birth size (categorical) were included in the analysis.

Data analysis

Data were analysed using the bivariate association between a set of covariates and two dependent variables of interest, that is, early initiation of breast feeding and prelacteal feeding. Since the early initiation of breast-feeding variable was constructed as a binary variable as to whether or not a child was breastfed within 1 hour after birth, we used a multivariate logistic regression model to identify the correlates of early vs late initiation of breast feeding. Prelacteal feeding was also constructed as a binary variable based on the information as to whether

the child was fed anything other than breastmilk in the first 3 days after delivery. So we used a multivariate logistic regression model to identify the correlates of prelacteal breast feeding.

Unlike the early initiation of breast feeding, prelacteal feeding also involved a temporal association (the time within which the mother started feeding anything other than the breastmilk in the first 3 days after delivery). Therefore, the survival analysis was used using Kaplan-Meier and Cox proportional hazard techniques to identify the factors associated with prelacteal feeding. We selected explanatory variables for Cox proportional hazard and multinomial regression models through ad hoc selection ($p < 0.05$). However, two important theoretical variables such as adequate treatment and proper guidance variables were included in this model due to their alignment with the study objectives.

Patient and public involvement

None

RESULTS

The mean age of the participants was 28.5 (variance 9), and all the respondents belonged to the rural areas in the selected districts of Sindh province. Most of respondents' households worked on agricultural lands, and women helped their families in agriculture and cattle farming. The prevalence of early initiation of breast feeding in our sample was 67.8% (variance 21.84%), and prelacteal feeding was 67.9% (variance 21.80%). The bivariate association between early initiation of breast feeding and a set of correlates suggests that except for adequate treatment and proper guidance during ANC visits, all other factors are significantly associated with the early initiation of breast feeding (table 1).

Table 2 gives the estimates from the logistic model and suggests that the factors that increased the odds of early initiation of breast feeding included proper guidance at the time of ANC visits, birth at a public health facility, and child's birth weight > 2.5 kg. The factors that reduced the odds of early initiation of breast feeding were normal vaginal birth compared with caesarean section and birth at a private health facility compared with home-based delivery.

Since the independent variables in the regression model may be interrelated, such as place of delivery and postpartum health check, we estimated the variance inflation factor (VIF) to test the presence of multicollinearity among the independent variables. Though there is universal agreement on the threshold value of VIF, $VIF < 5$ is generally considered an indication that no serious multicollinearity exists among the explanatory variables. Since all the VIF values are less than 2.5, multicollinearity is not a serious issue in our regression analysis.

Table 1 Bivariate association between early initiation of breast feeding and set of correlates

Variables	No N=1546 (32.2%)	Yes N=3254 (67.8%)	P value
Prevalence of early initiation of breast feeding 67.8%			
Adequate treatment received at the time of delivery			0.421
No	361 (23.4%)	796 (24.5%)	
Yes	1185 (76.6%)	2458 (75.5%)	
Proper guidance during pregnancy			0.586
No	440 (28.5%)	900 (27.7%)	
Yes	1106 (71.5%)	2354 (72.3%)	
Post-partum health check			<0.001
No	1050 (67.9%)	1487 (45.7%)	
Yes	496 (32.1%)	1767 (54.3%)	
Mode of delivery			0.010
C-Section	232 (15.0%)	399 (12.3%)	
Vaginal	1314 (85.0%)	2855 (87.7%)	
Place of delivery			0.001
Home	412 (26.6%)	1011 (31.1%)	
Private health facility	382 (24.7%)	827 (25.4%)	
Public health facility	752 (48.6%)	1416 (43.5%)	
Skin contact			<0.001
No	694 (44.9%)	462 (14.2%)	
Yes	852 (55.1%)	2792 (85.8%)	
Birth size			<0.001
<2.5 kg	205 (13.3%)	247 (7.59%)	
>2.5 kg	377 (24.4%)	724 (22.2%)	
Don't know	964 (62.4%)	2283 (70.2%)	

Prelacteal feeding in the first 3 days: survival analysis

The bivariate association between the prelacteal feeding and a set of correlates suggests that all variables under study were significantly associated ($p < 0.05$) with the outcome variable: whether the child was given anything to drink other than breast milk in the first 3 days after delivery (table 3).

Table 4 gives the estimates from the logistic model and suggests that the factors that increased the odds of prelacteal feeding included proper guidance at the time of ANC visits, birth at a public health facility, vaginal delivery, skin-to-skin contact and child's birth weight >2.5 kg. However, adequate treatment and postpartum health check-up decreased the odds of prelacteal feeding.

The Kaplan-Meier plots (prelacteal feeding)

The Kaplan-Meier plots stratified according to adequate treatment and proper guidance at the time of delivery (figure 2) indicate that the children whose mothers

Table 2 Logistic model of early initiation of breast feeding

Early initiation of breast feeding	AOR (95% CI)	VIF
Adequate treatment received at the time of delivery: Yes (Ref. No)	0.98 (0.78 to 1.23)	2.343013
Proper guidance during pregnancy: Yes (Ref. No)	3.48*** (2.98 to 4.07)	2.308533
Postartum health check: Yes (Ref. No)	1.14 (0.93 to 1.39)	1.284914
Mode of delivery: Vaginal (Ref. C-Section)	0.69*** (0.57 to 0.84)	1.076244
Place of delivery: Private health facility (Ref. Home)	0.54*** (0.45 to 0.64)	1.328062
Public health facility	5.01*** (4.31 to 5.83)	
Skin contact: Yes (Ref. No)	1.20 (0.94 to 1.54)	1.070859
Birth size: >2.5 kg (Ref. <2.5 kg)	1.59*** (1.27 to 2.00)	1.214577
Don't know	0.49*** (0.36 to 0.66)	
Constant	0.67*** (0.53 to 0.86)	
Observations	4800	
Log likelihood	-2600.41	
Akaike Inf. Crit.	5220.81	

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.
VIF, variance inflation factor.

received adequate treatment at the health facility where they visited for birth had a lower likelihood of prelacteal feeding. The children whose mothers had proper guidance during ANC visits had, counterintuitively, a higher probability of receiving prelacteal feeding. The children whose mothers received postpartum health check had also lower probability of receiving prelacteal feed. The log-rank $p < 0.05$ suggests that all the strata were significantly different from each other with respect to the probability of facing the event of prelacteal feeding.

Similarly, the children who were delivered by c-section, born at private health facility and had skin-to-skin contact with the mother had a smaller likelihood of receiving prelacteal feeding (figure 3). The log-rank $p < 0.05$ in the case of place of delivery and skin contact suggests that the all the strata were significantly different from each

Table 3 Bivariate association between the prelacteal feeding and set of correlates (N=4800)

	No N=3259 (67.9%)	Yes N=1541 (32.1%)	P value
Prevalence of prelacteal feeding	32.1%		
Adequate_treatment:			<0.001
No	914 (28.0%)	243 (15.8%)	
Yes	2345 (72.0%)	1298 (84.2%)	
Proper_guidance:			<0.001
No	963 (29.5%)	377 (24.5%)	
Yes	2296 (70.5%)	1164 (75.5%)	
Postpartum_health_check:			<0.001
No	2136 (65.5%)	401 (26.0%)	
Yes	1123 (34.5%)	1140 (74.0%)	
Mode_of_delivery:			0.036
C-Section	405 (12.4%)	226 (14.7%)	
Vaginal	2854 (87.6%)	1315 (85.3%)	
Place_of_delivery:			<0.001
Home	1121 (34.4%)	302 (19.6%)	
Private health facility	785 (24.1%)	424 (27.5%)	
Public health facility	1353 (41.5%)	815 (52.9%)	
Skin_contact:			<0.001
No	1030 (31.6%)	126 (8.18%)	
Yes	2229 (68.4%)	1415 (91.8%)	
Birth_size:			<0.001
<2.5 kg	380 (11.7%)	72 (4.67%)	
>2.5 kg	663 (20.3%)	438 (28.4%)	
Don't know	2216 (68.0%)	1031 (66.9%)	

other with respect to the probability of facing the event of prelacteal feeding. The log-rank p value equals to 0.32 in the case of mode of delivery suggests that different strata were not significantly different from each other with respect to the probability of facing the event of prelacteal feeding.

Cox proportional hazards model

Proper guidance to mothers during ANC visits and normal vaginal birth compared with birth by caesarean section were associated with a smaller likelihood of prelacteal feeding. Conversely, adequate treatment facilities at the health facility where women visited for delivery and post-partum health check, delivery at the public or private health facility and birth weight >2.5 kg were associated with a greater likelihood of prelacteal feeding (figure 4).

DISCUSSION

The prevalence of early initiation of breast feeding was 68%, and prelacteal feeding was found to be 32% in this study. It is well documented that prelacteal feeding is a major determinant of delayed initiation of breast feeding in LMICs.²² Our findings are consistent with a study

Table 4 Logistic model of prelacteal feeding

Prelacteal feeding	AOR (95% CI)	VIF
Constant	2.82*** (2.18 to 3.65)	
Adequate treatment: Yes (Ref. No)	0.29*** (0.23 to 0.37)	2.11
Proper guidance: Yes (Ref. No)	5.88*** (5.04 to 6.89)	2.24
Post-partum health check: Yes (Ref. No)	0.65*** (0.53 to 0.80)	1.22
Mode of delivery: Vaginal (Ref. C-Section)	1.23** (1.00 to 1.51)	1.06
Place of delivery: Private health facility (Ref. Home)	1.36*** (1.12 to 1.64)	1.31
--- Public health facility	5.29*** (4.30 to 6.56)	
Skin contact: Yes (Ref. No)	2.41*** (1.77 to 3.31)	1.04
Birth size: >2.5 kg (Ref.<2.5 kg)	2.31*** (1.73 to 3.13)	1.15
--- Don't know	0.03*** (0.02 to 0.04)	
Observations	4800	
Log Likelihood	-2428.22	
Akaike Inf. Crit.	4876.43	

*p<0.05, **p<0.01, ***p<0.001.
VIF, variance inflation factor.

conducted in the Sindh province of Pakistan, which also showed an almost similar proportion of women who initiated breast feeding early.²³ The prevalence of early breast-feeding initiation was optimal in this research compared with the WHO's recommendations and targets for early initiation of breast feeding.¹⁶ Moreover, our findings about the prevalence of early initiation of breast feeding are consistent with studies conducted in other LMICs like Kenya (58%),²⁴ Ethiopia (52%)²⁵ and Tanzania (49%).²⁶ A 2018 UNICEF report showed that 43% of newborns globally and 46% in Pakistan were breastfed within an hour of birth.⁷ However, the prevalence of early initiation of breast feeding was slightly higher in the present study, which could be because this study was conducted in primarily rural districts of Sindh where women are mostly housewives and have ample time to attend to their newborns, and may not afford milk substitutes like formula milk.²⁷⁻³⁰

The prevalence of prelacteal feeding in our study was also about 32%. It is not surprising that families prefer to give a prelacteal feeding before breast milk, because

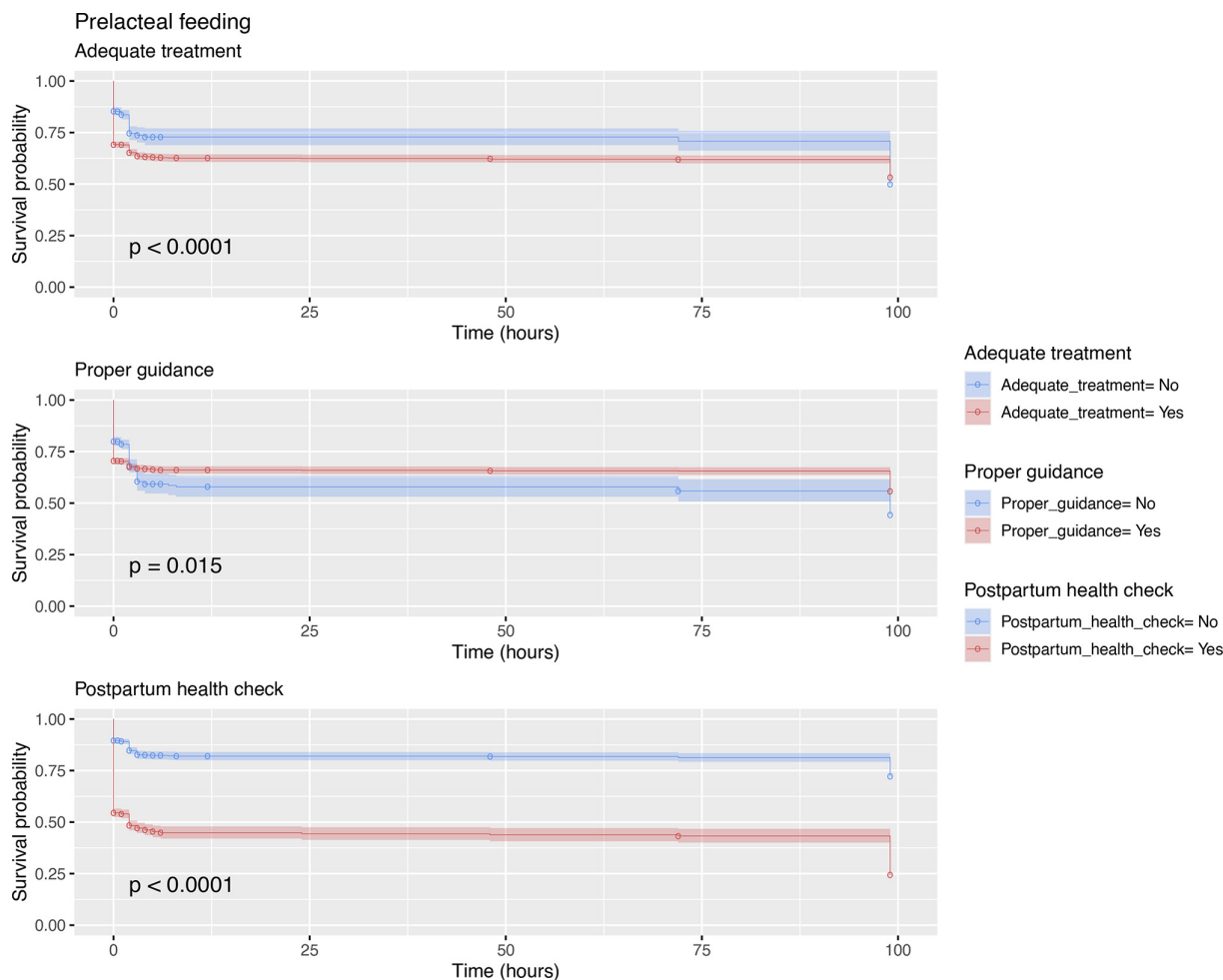


Figure 2 Kaplan-Meier plots for adequate treatment, proper guidance during ANC visits and postpartum health check. ANC, antenatal care.

a prelacteal food is considered a sacred concoction and is part of a value system where it is customary to feed a wide range of foods to newborns immediately after birth. In previous research conducted in Pakistan, the proportion of women who practiced prelacteal feeding ranged from 44% to 62%.³¹ Our findings are consistent with the literature showing that two-thirds of newborns are given a prelacteal feeding immediately after birth.^{28 32} Contrary to these results, a study reported a lower prevalence of prelacteal feeding in Vietnam. This difference could be because of the cultural and social differences between the populations.³³ The prevalence of the prelacteal feeding rate in Pakistan does not differ significantly from the prelacteal feeding rate in the neighbouring countries, like 21% in India,¹⁰ 27% in Bangladesh¹¹ and 43% in Afghanistan.¹²

Our study found that adequate treatment and postpartum health check decrease the odds of prelacteal feeding practices. The postpartum period refers to the first 6 weeks after childbirth.³⁴ The initial or acute phase of postpartum care that includes 8–19 hours after childbirth is the window of the opportunity to start early initiation of breast feeding. According to the WHO recommendations, mothers must be counselled about the importance

of breast feeding in acute phase of postpartum care for optimal breastfeeding practices.³⁵ However, counterintuitively, proper guidance, vaginal delivery, birth at private or public health facility, skin contact and birth weight >2.5 kg all significantly increased the odds of prelacteal feeding. Similar results were reported from a study in Pakistan that antenatal visits by women are not effective in reducing the prevalence of prelacteal feeding due to lack of ANC quality.⁹ The practice of prelacteal feeding was not very different in our study compared with the regional countries, which could possibly be a shared South Asian social norm. A study explains that widespread misinformation and misplaced perceptions about prelacteal feeding exist in Pakistan which discourage women to feed colostrum to the newborn children.⁹ Some other studies from Pakistan also highlight that mothers avoid colostrum milk due to diverse beliefs that it is thick, stale, or harmful to newborns' health.^{9 13 23 30} In such circumstances, women prefer to give prelacteal feeding as a substitute for colostrum.

In our study, adequate treatment of mothers during birth, post-partum health check-up, normal vaginal birth and birth at a public health facility were strong predictors of early initiation of breast feeding. Studies supports

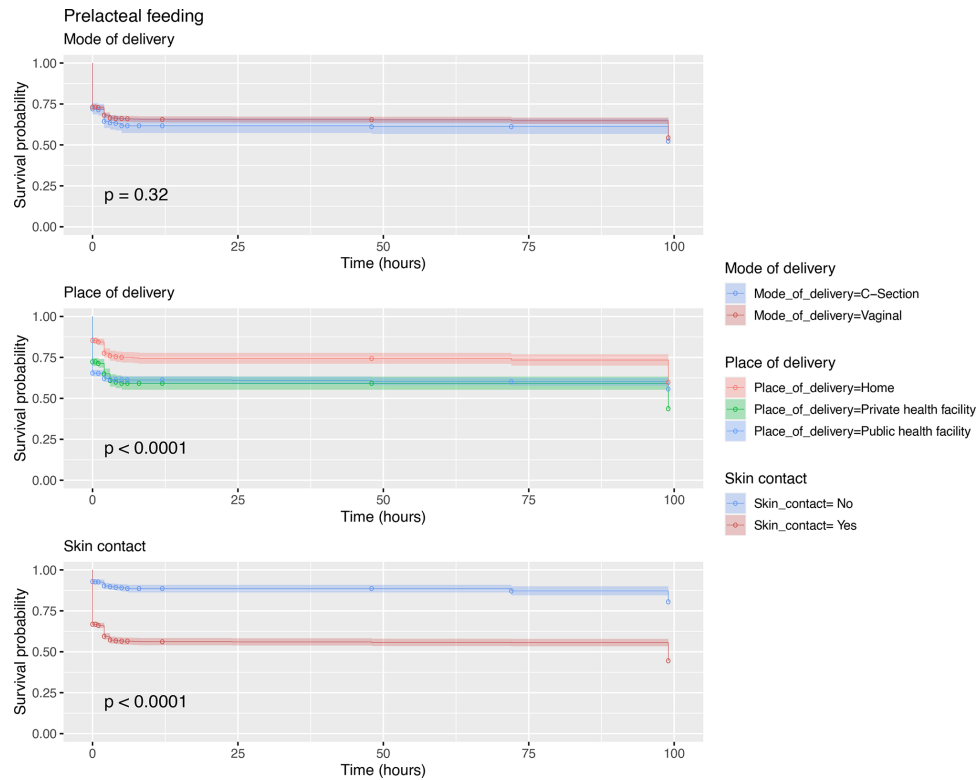


Figure 3 Kaplan-Meier plots for mode of delivery, place of delivery and skin contact.

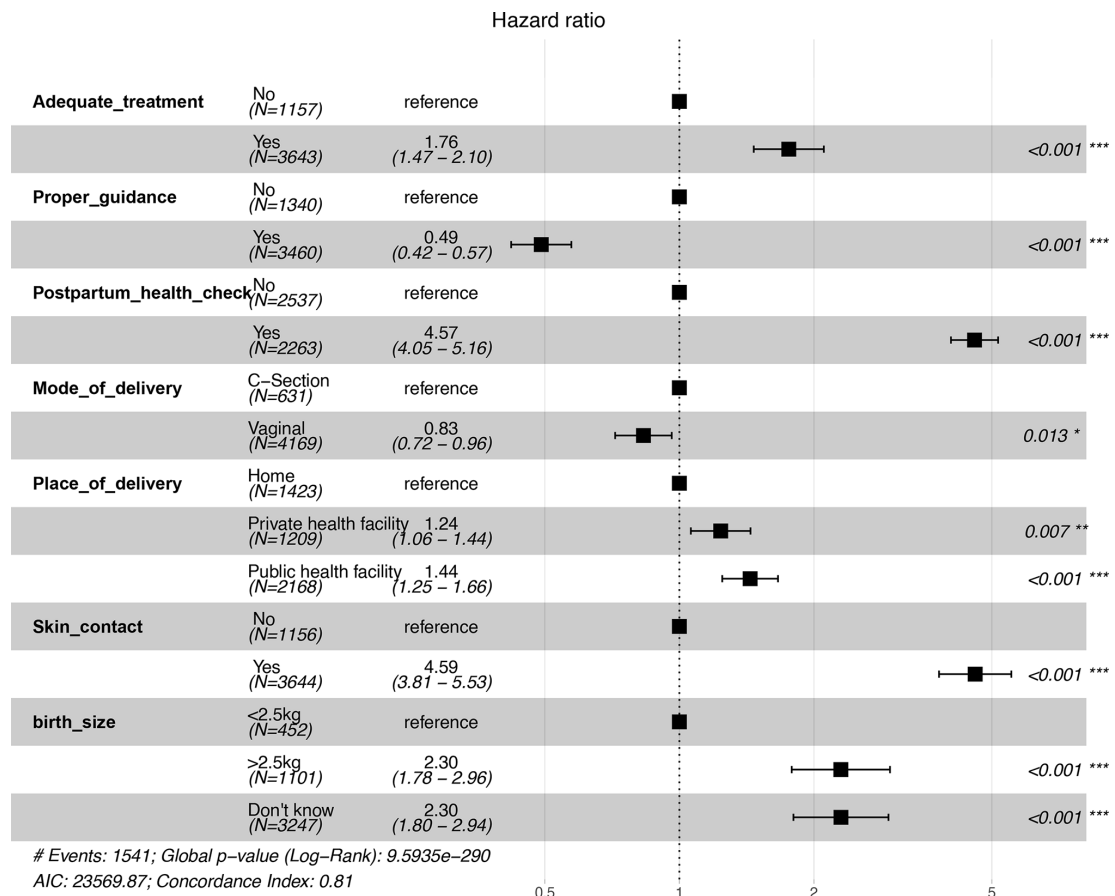


Figure 4 Forest plot of Cox proportional hazard model.



that the mother's postpartum health check-up immediately after birth is found positive predictor of early breast feeding.^{36 37} Our estimates are supported by previous research that has found that institutional births by skilled birth attendants and ANC visits with adequate breastfeeding counselling are linked with an increased uptake of early initiation of breast feeding.^{13 19} The fact that vaginal delivery delayed breastfeeding initiation in our study could be due to the lack of awareness and proper counselling in rural women and the popular belief that the colostrum needs to be discarded.

Moreover, the unskilled birth attendants conducting home deliveries in rural areas might also influence delaying breast feeding.^{9 19} This could also mean that births with skilled birth attendants and at health facilities help prevent complications at birth, allowing mothers to bond with and breastfeed their babies soon after birth. For instance, a study showed that newborns who cried immediately at birth were breastfed immediately as compared with those who did not cry.³⁸ Skilled birth attendants also need to be trained in newborn resuscitation to avoid more delays in initiation of breast feeding following birth.⁵

In our study, adequate counselling and guidance by skilled birth attendants during ANC visits was linked with higher odds of early breastfeeding initiation. Another study from Pakistan also concurs with these findings that mothers with proper guidance at their ANC visits were more likely to initiate breast feeding early.²³ Along with ANC, mothers' and newborns' postnatal care also needs special attention. Studies from other similar contexts have consistently identified a link between counselling by skilled birth attendants and ANC providers and early and exclusive breast feeding.^{19 39 40} Counselling following birth and postpartum period positively influences women's decisions to initiate breast feeding early.¹⁹ Previous research has also shown that trained health workers can guide mothers towards initiating breast feeding early by informing them of its advantages. They can also explain the harms of prelacteal feed and the benefits of exclusive breast feeding.⁴¹

Skin-to-skin contact between mothers and their newborns was found to be another strong predictor of early initiation of breast feeding in this study. Studies have also particularly identified that skin-to-skin contact between mothers and their babies can significantly increase early initiation of breastfeeding rates.^{15 16 41} Trained birth attendants have the potential to ensure the early initiation of breast feeding and guide the importance of skin-to-skin contact after birth. The presence of trained birth attendants at birth can improve the breastfeeding rate in communities where it is still suboptimal.¹⁹

CONCLUSIONS

The suboptimal prevalence rates of both early initiation of breast feeding and prelacteal feeding in this study highlights the need to further increase the early initiation of

breastfeeding practices to improve maternal and neonate health outcomes. Mothers can be counselled about the importance of early initiation of breast feeding and the adverse effects of prelacteal feeding through targeted strategies and interventions of optimal breastfeeding practices. In our study, factors like quality of treatment, postnatal healthcare utilisation, adequate treatment of mothers during delivery, institutional births with trained birth attendants and skin-to-skin contact between mother and baby increase the early initiation of breast feeding. Similarly, adequate treatment at the place of birth and postpartum health check discourage prelacteal feeding. This study has explored various characteristics of Pakistan's health system and behavioural factors that compromise the early initiation of breast feeding and exclusive breast feeding. Policy makers need to streamline Pakistan's health system and influence behavioural factors to promote early initiation and exclusive breast feeding.

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Patient consent for publication Consent obtained directly from patient(s).

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Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

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