BMC Nutrition

RESEARCH

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Prelacteal feeding practice and its associated factors in Afghanistan: insights from the 2022–2023 multiple indicator cluster survey

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Abstract

Background Prelacteal feeding (PLF), which refers to giving liquids or non-breast milk food to infants within 3 days of birth, can adversely affect neonatal health and survival. Despite its recognized health risks, PLF remains prevalent in many low- and middle-income countries (LMICs), including Afghanistan, where evidence on its determinants is limited. Thus, this study aimed to determine the prevalence and associated factors of PLF practice in Afghanistan.

Methods We analyzed data from 11,964 ever-married women aged 15–49 years with a live birth in the previous two years. PLF was defined according to the MICS convention. Multivariable logistic regression models were used to identify factors associated with PLF, accounting for survey design and sampling weights. Interaction terms were tested for (1) place of delivery and household wealth and (2) private facility and cesarean section.

Results The prevalence of PLF was 33.3%. The odds of PLF practice were lower in women with primary (AOR 0.72; 95%CI 0.58–0.89) and secondary/higher (AOR 0.73; 95%CI 0.58–0.92) education and in women with early initiation of breastfeeding (AOR 0.37; 95%CI 0.33–0.42). Conversely, women residing in rural areas (AOR 1.27; 95%CI 1.06–1.54), those delivering in private health facilities (AOR 1.38; 95%CI 1.11–1.72), women who had cesarean section (AOR 1.72; 95%CI 1.31–2.25), and those in middle to higher wealth quintiles were more likely to practice PLF. Interaction analyses showed that the positive association between wealth and PLF was concentrated among women delivering in private facilities, with private-sector births exhibiting consistently elevated PLF across all wealth groups. The interaction between private delivery and cesarean section was not significant, indicating that high PLF levels in private facilities were not driven by cesarean rates.

Conclusion One in three Afghan newborns receives prelacteal feeds. Private-sector maternity care, socioeconomic gradients linked to facility choice, cesarean delivery, rural residence, and delayed breastfeeding initiation are key drivers of PLF. Strengthening breastfeeding support in private facilities, promoting early initiation of breastfeeding, and enhancing maternal education—particularly in rural and higher-income communities—are essential to reducing PLF in Afghanistan.

Keywords Afghanistan, Infant feeding practices, Prelacteal feeding, Breastfeeding

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Introduction

Prelacteal feeding (PLF), the practice of giving liquids or semi-solid foods other than breast milk to newborns within the first three days of life, is a widespread but harmful practice that can negatively affect neonatal health and survival. PLF deprives infants of colostrum, which is rich in immunological and nutritional benefits, and increases the risk of infection, malnutrition, and delayed initiation of breastfeeding [1]. Although the World Health Organization (WHO) recommends initiating breastfeeding within the first hour of birth, PLF remains prevalent in many low- and middle-income countries (LMICs), particularly in South Asia, where cultural and traditional beliefs often override medical guidelines [2–4].

PLF can disrupt the physiological processes necessary for successful lactation, including prolactin secretion and the establishment of the infant's suckling reflex [5]. It may also undermine maternal confidence in breastfeeding and foster early dependence on formula or other feeding substitutes [6]. Globally, nearly 4000 infants die each day due to the lack of optimal breastfeeding [7]. In LMICs, approximately 51% of newborns are exposed to PLF, particularly in South Asia, where reported prevalence rates remain high in countries such as Bangladesh (23%) [8], India (40.1%) [9], Nepal (30.6%) [10], and Pakistan (64.9%) [11].

PLF not only delays exclusive breastfeeding but also increases the risk of neonatal and infant mortality. Studies show that PLF is associated with a threefold higher risk of death among infants aged 2 to 28 days, and a substantially elevated perinatal mortality rate [12, 13]. Inadequate breastfeeding practices during the first six months are estimated to contribute to 96% of infant deaths in LMICs [14]. Afghanistan, with an infant mortality rate of 43 deaths per 1,000 live births in 2021, ranks among the highest globally [15, 16]. Only 46% of Afghan mothers initiate breastfeeding within one hour of birth, and exclusive breastfeeding rates remain suboptimal at 67% [5, 17].

PLF practice was primarily linked to various sociodemographic and economic factors, including maternal age, occupation, income, education, residence, child's age, sex, and birth order [18, 19]. Additionally, factors related to maternal healthcare service utilization, mode of delivery, place of birth, and breastfeeding counseling were also significant [3, 9, 13, 19, 20]. Additionally, deeply rooted cultural beliefs and limited awareness about the benefits of early and exclusive breastfeeding further contribute to the persistence of PLF practice [6, 20–22].

Despite growing interest in infant and young child feeding (IYCF) in Afghanistan, existing research has largely focused on broader breastfeeding indicators [5, 17, 23]. To date, no nationally representative study has specifically examined the prevalence and determinants of PLF in the Afghan context. This gap is critical, given Afghanistan's unique sociocultural and healthcare landscape, and the persistently high burden of infant mortality. Therefore, this study aims to determine the prevalence and associated factors of PLF practice in Afghanistan. The findings are intended to inform public health policy, guide the design of culturally sensitive interventions, and support governmental and non-governmental stakeholders in improving maternal and child health outcomes in Afghanistan.

Methods

Study design and data source

Data from the Afghanistan Multiple Indicator Cluster Survey (MICS) 2022–2023 were used and analyzed. The MICS 2022–2023, which collected data from a nationally representative sample, applied a two-stage cluster sampling approach. The sampling method, data collection, and survey design are reported elsewhere [24]. For the MICS 2022–2023, trained surveyors collected data from women aged 15–49 years who answered questions on child and maternal health and nutrition. In this study, we used data from 11,964 ever-married women aged 15–49 years who had a live birth within the 2 years prior to the MICS 2022–2023 survey (Fig. 1).

Study variables

The outcome variable was any PLF practice, defined according to the MICS convention, and measured using the following two questions: was the child ever breastfed, and was the newborn given anything to drink other than breast milk in the first three days after delivery [4, 9]. Using the binary responses from these questions, we created the binary outcome of "yes" vs. "no". This binary outcome was fitted to run the logistic regression analysis. Although we acknowledge that this definition does not fully capture the WHO definition, it is the most pragmatic way to identify PLF practice in large national surveys [25–27].

The explanatory variables were women's age at time of survey (15–24, 25–39, and 40–49 years), women's education level (no formal education, primary education, and secondary or higher education), education level of the household head (no formal education, primary education, and secondary or higher education), place of residence (urban vs. rural), sex of infant (male vs. female), birth order (1st child vs. 2nd or higher child), early initiation of breastfeeding (whether breastfeeding was started within first hour of birth), antenatal care (ANC) utilization (no visit, 1–3 visits, ≥ 4 visits), type of ANC provider (doctor, midwife, nurse, community healthcare worker, and traditional birth attendant), immediate postnatal care (PNC) for newborn (whether the newborn was checked after delivery), place of delivery (whether

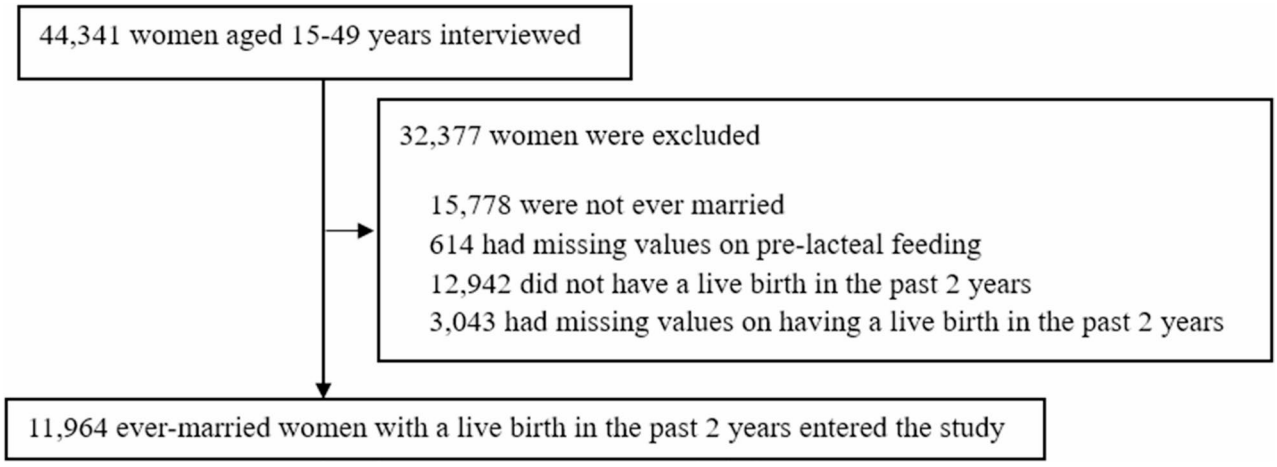

Fig. 1 Final sample size and schematic presentation of the sample selection

the woman gave birth at home, government health facilities, or private health facilities), household wealth index (lowest quintile up to highest quintile), large baby at birth (whether the newborn baby was large size at birth), cesarean section (yes vs. no) for her latest childbirth, and access to media (yes vs. no). The variable for a large baby at birth was created based on the mother's perception, as it was not possible to use objectively measured newborn weight, given nearly 80% missing values for this question in the MICS 2022-23 database. The variable on access to media was created as a composite measure and was defined as "yes" if the woman listened to the radio daily, watched TV daily, or read a newspaper, and as "no" if otherwise. We created the variable on access to media as a composite measure because it was not possible to use a variable for each of them in the regression model, as only 16.4%, 4.8%, and 0.2% of women, respectively, watched TV daily, listened to the radio daily, and read a newspaper. This composite measure, however, may mask the nuanced effects of listening to the radio in rural Afghanistan, given that radio may be the primary source of media access in these areas. In addition, we analyzed the types of drink or semi-solid food given to newborns by women who practiced PLF.

Statistical analysis

We assessed the distribution of sociodemographic characteristics of women using descriptive statistics. The chi-square test was used to examine the relationship between categories of explanatory variables and PLF practice status. Multivariable binary logistic regression models were fitted and run to examine the likelihood of PLF across the categories of explanatory variables. For model selection, we selected explanatory variables considering the literature [1, 7, 9, 11, 19, 21, 24], and produced unadjusted and adjusted odds ratios (AOR) and 95% confidence interval (CI) using the bivariate and multivariable logistic regression analyses. In light of the literature and using the directed acyclic graphs (DAGs) generated with DAGitty, we examined the relationships among the independent variables and the outcome [28]. DAGitty, a free online application for drawing and analyzing DAGs, is available on the R platform for statistical computation [28]. All identified covariates were included in the primary model. Although the number of ANC visits and the type of ANC provider are related constructs, collinearity diagnostics indicated no problematic multicollinearity (VIF = 2.47; condition number = 6.7). Both variables were therefore retained to capture complementary dimensions of ANC utilisation (intensity and provider type). Given evidence from earlier studies suggesting potential effect modification, we further tested two interaction terms: (1) place of delivery and household wealth quintile, and (2) private health facility and cesarean section. These interaction models were estimated in addition to the main-effects model to assess whether the associations between delivery setting, socioeconomic status, mode of delivery, and PLF differed across subgroups. For the interaction term between private health facility and cesarean section in model 3, we restricted the sample to facility births (public or private), as cesarean delivery cannot occur among home births. To assess the robustness of the findings and address potential model-related biases, we conducted two additional sensitivity analyses. First, given the relatively high prevalence of PLF practice (33.3%), we re-estimated all models using survey-weighted modified Poisson regression with robust variance to obtain adjusted prevalence ratios (APRs). Second, because early initiation of breastfeeding is temporally proximate to PLF practice and may lie on the causal pathway for delivery-related factors, we repeated all models excluding early initiation of breastfeeding to evaluate potential overadjustment. Results from these sensitivity analyses are presented in the Supplementary Materials (Tables S1 and

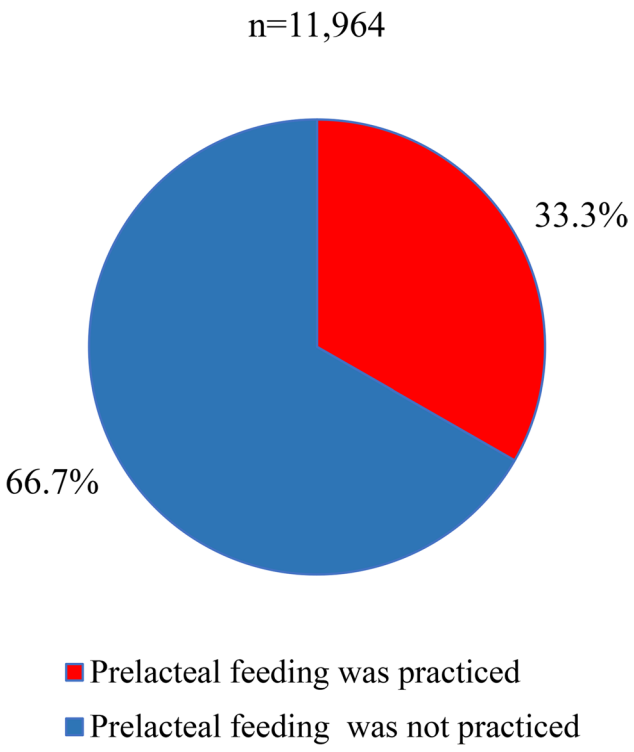

Fig. 2 Prevalence of prelacteal feeding practice

S2). We applied a sampling design and weights by using the survey strata and primary sampling unit. All data analyses were conducted using STATA version 17 [29].

Results

Figure 2 shows that out of 11,964 ever-married women, 3,990 (33.3%) reported PLF practice for their latest live-birth newborn over the past two years prior to the survey (Fig. 2).

Figure 3 shows that out of 3,990 ever-married women who reported PLF practice, 45.0% gave sugar or glucose water, 28.9% gave tea or a traditional herbal solution, 15.2% gave plain water, and 13.1% gave other liquids to their newborns within the first hour after birth. The proportion of women who gave milk (other than breast milk), infant formula, gripe water, and sugar-salt-water solution ranged from 12.0% to 2.8% (Fig. 3).

Table 1 presents the baseline characteristics of women based on the status of PLF practice. There were significant differences in specific characteristics between women who practiced PLF and those who did not. Notably, PLF was more common among women from wealthier households and those who delivered in private health facilities. Additionally, PLF was more prevalent among women with media access and those who underwent cesarean delivery. Conversely, PLF was significantly less common among women with secondary or higher education and among those who initiated breastfeeding within the first hour of birth. For instance, among women in the highest wealth quintile, 16.9% reported practicing PLF, compared to 11.2% who did not (Table 1).

Main-effects model: sociodemographic and clinical determinants of PLF

Model 1 examined the independent associations between maternal, household, and delivery-related characteristics and PLF (Table 2). Women with primary education (AOR 0.72; 95%CI 0.58–0.89) and secondary or higher education (AOR 0.73; 95%CI 0.58–0.92) had significantly lower odds of practicing PLF compared to women with no formal education. Similarly, early initiation of breastfeeding was strongly associated with reduced odds of PLF (AOR 0.37; 95%CI 0.33–0.42). In contrast, women from higher wealth quintiles had significantly increased odds of PLF compared to those in the lowest quintile: third quintile

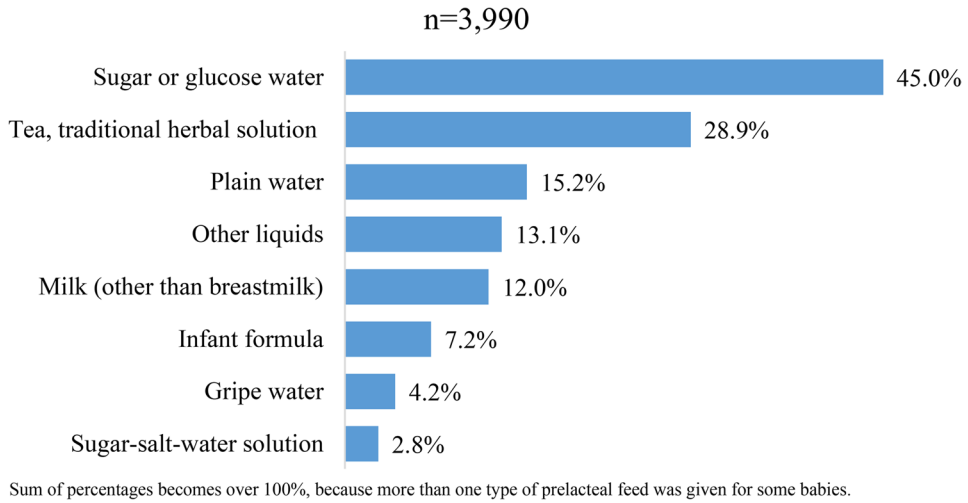

Fig. 3 Types of liquids given to newborn babies by women who practiced prelacteal feeding

Table 1 Sociodemographic and healthcare-related characteristics of the study population

Characteristics	Total *n* (weighted %) 11,964 (100)	PLF: No (weighted %) (66.7)	PLF: Yes (weighted %) (33.3)	*P*-value
Women's age (years)				
15–24	30.9	30.4	31.9	0.25
25–39	61.9	62.6	60.7	
40–49	7.2	6.9	7.5	
Women's education				
No formal education	76.0	75.0	77.8	0.10
Primary	10.4	11.0	9.3	
Secondary/higher	13.6	14.0	12.9	
Household head education				
No formal education	62.2	63.1	60.6	0.22
Primary	12.9	12.6	13.4	
Secondary/higher	24.9	24.2	26.1	
Antenatal care (ANC) utilization				
No visit	22.1	24.8	17.2	< 0.001
1–3 visits	44.5	43.3	46.8	
≥ 4 visits	33.4	31.9	36.0	
Type of ANC provider				
Midwife/nurse	55.6	54.4	57.8	< 0.001
Doctor	20.8	19.2	23.8	
CHW/TBA	1.7	1.9	1.5	
No ANC visit	21.9	24.6	17.0	
Place of delivery				
Home	33.6	34.1	32.7	< 0.001
Public health facility	55.9	57.3	53.3	
Private health facility	10.5	8.6	13.9	
Cesarean section				
No	94.4	96.1	91.2	< 0.001
Yes	5.6	3.9	8.8	
Early initiation of breastfeeding				
No	50.3	41.7	66.3	< 0.001
Yes	49.7	58.3	33.7	
Immediate postnatal care (PNC) for the newborn				
No	79.2	79.4	78.8	0.64
Yes	20.9	20.7	21.2	
Sex of child				
Male	51.6	51.7	51.4	0.78
Female	48.4	48.3	48.6	
Birth order				
1st child	16.1	15.4	17.4	0.04
2nd or higher child	83.9	84.6	82.7	
Large-sized baby				
No	95.9	96.1	95.5	0.25
Yes	4.1	3.9	4.5	
Women's access to media				
No	79.6	80.8	77.4	< 0.001
Yes	20.4	19.2	22.6	
Residential area				
Urban	23.1	23.5	22.4	0.36
Rural	76.9	76.5	77.6	
Wealth status				

Table 1 (continued)

Characteristics	Total *n* (weighted %) 11,964 (100)	PLF: No (weighted %) (66.7)	PLF: Yes (weighted %) (33.3)	*P*-value
Lowest quintile	20.8	21.9	18.7	< 0.001
Second	21.0	22.3	18.5	
Third	20.4	19.7	21.7	
Fourth	19.5	18.6	21.2	
Highest quintile	18.4	17.6	19.9	

Abbreviations: *CHW* Community healthcare worker, *PLF* Prelacteal feeding, *TBA* Traditional birth attendants

(AOR 1.24; 95%CI 1.04–1.47), fourth quintile (AOR 1.34; 95%CI 1.11–1.61), and fifth quintile (AOR 1.34; 95%CI 1.01–1.76). Additionally, women residing in rural areas (AOR 1.27; 95%CI 1.06–1.54), those who delivered in private health facilities (providers) (AOR 1.38; 95%CI 1.11–1.72), and those who had cesarean deliveries (AOR 1.72; 95%CI 1.31–2.25) were more likely to report PLF compared to their respective reference groups (urban residents, home deliveries, and vaginal births).

Variation in PLF by delivery sector within wealth groups

Model 2 assessed whether the association between place of delivery and PLF varied across household wealth groups (Table 2). In the model, each health facility and wealth category was compared directly to the reference group (poorest mothers delivering at home). PLF odds were consistently and substantially higher across all wealth groups in private facilities, with odds ratios ranging from 1.68 to 2.11, indicating that private-facility delivery is a strong predictor of PLF irrespective of household wealth. In contrast, wealth gradients were minimal among home births and largely absent in government facilities. These results suggest that the elevated PLF prevalence observed among wealthier women in the main-effects model reflects their greater likelihood of delivering in private facilities rather than a direct effect of wealth itself.

Variation in PLF by delivery mode across facility types

Model 3 assessed whether the association between place of delivery and PLF differed by mode of delivery (Table 2). Results are presented as stratum-specific adjusted odds ratios. Among vaginal deliveries, births occurring in private facilities had significantly higher odds of PLF compared with vaginal births in public facilities (AOR 1.69; 95% CI: 1.36–2.11). Among public facility deliveries, cesarean section was associated with more than twice the odds of PLF compared with vaginal delivery (AOR 2.06; 95% CI: 1.57–2.70). In private facilities, cesarean delivery was also associated with higher odds of PLF relative to public facility vaginal births, although this difference was not statistically significant (AOR 1.48; 95% CI: 0.76–2.86). Overall, these findings suggest that higher PLF prevalence in private facilities is not solely explained by cesarean section rates.

Discussion

To the best of our knowledge, this study is the first to investigate the prevalence and associated factors of PLF practice in Afghanistan. We found the prevalence of PLF to be 33.3%. Factors significantly associated with PLF practice were women's education level, place of residence, early initiation of breastfeeding, place of delivery, cesarean section, and household wealth status. Moreover, interaction analyses revealed that the effects of wealth and delivery sector, as well as the relationship between cesarean section and private facility delivery, contributed important contextual nuances to PLF patterns in the country.

The prevalence of PLF varies widely, with studies reporting rates of 20% to 65% in LMICs [1, 7, 10, 30]. The prevalence in the current study (33.3%) is comparable to studies conducted in Ethiopia (25.2%) [18], Bangladesh (23%) [8], India (40.1%) [9], and Nepal (30.6%) [10]. Although no prior study has quantified PLF nationally in Afghanistan, existing research indicates that adherence to other optimal breastfeeding indicators, such as early initiation and exclusivity, has historically been low [5, 17, 23]. Moreover, cultural and religious practices in Afghanistan often delay early breastfeeding initiation. Common traditional PLF practices include butter oil, sweet water, boiled herbs, Zamzam water, and Karbala clay (Mohr) [17, 23]. These practices not only deprive infants of colostrum's immunological benefits but also risk exposure to pathogens or inappropriate nutrient substitutes. Given these challenges, there is a pressing need to strengthen culturally appropriate health promotion efforts that respect local beliefs while addressing harmful traditional practices. Engaging community and religious leaders in promoting accurate information can improve breastfeeding behaviors and reduce newborn health risks in Afghanistan.

Consistent with studies from Ethiopia [1, 31, 32] and Pakistan [11], Afghan women with primary or higher education were less likely to practice PLF than women with no formal education. The education level of mothers

Table 2 Likelihood of prelacteal feeding practice by ever-married women, aged 15–49 years

Characteristics	AOR (95%CI) Model I	AOR (95%CI) Model II	AOR (95%CI) Model III **
Women's age (years)			
15–24	Reference	Reference	Reference
25–39	0.93 (0.82–1.06)	0.94 (0.83–1.07)	0.92 (0.78–1.08)
40–49	1.03 (0.85–1.26)	1.05 (0.85–1.28)	1.16 (0.90–1.51)
Women's education			
No formal education	Reference	Reference	Reference
Primary	**0.72 (0.58–0.89)***	**0.73 (0.59–0.90)***	**0.74 (0.58–0.94)***
Secondary/higher	**0.73 (0.58–0.92)***	**0.73 (0.58–0.93)***	**0.75 (0.58–0.97)***
Household head education			
No formal education	Reference	Reference	Reference
Primary	1.11 (0.92–1.33)	1.12 (0.93–1.34)	1.05 (0.84–1.31)
Secondary/higher	1.06 (0.90–1.23)	1.07 (0.92–1.25)	1.02 (0.85–1.23)
Antenatal care (ANC) visits			
No visit	Reference	Reference	Reference
1–3 visits	1.29 (0.40–4.17)	1.22 (0.40–3.79)	1.10 (0.29–4.20)
≥ 4 visits	1.31 (0.41–4.18)	1.24 (0.41–3.82)	1.13 (0.30–4.25)
Type of ANC provider			
Midwife/nurse	Reference	Reference	Reference
Doctor	1.12 (0.96–1.30)	1.12 (0.96–1.31)	1.09 (0.91–1.30)
CHW/TBA	0.68 (0.45–1.03)	0.69 (0.46–1.05)	0.61 (0.34–1.10)
No ANC visit	0.83 (0.26–2.69)	0.78 (0.25–2.44)	0.77 (0.20–2.98)
Place of delivery			
Home	Reference	Reference	-
Public health facility	0.89 (0.78–1.02)	0.80 (0.62–1.01)	Reference
Private health facility	**1.38 (1.11–1.72)***	**1.98 (1.17–3.38)***	**1.69 (1.36–2.11)***
Cesarean section			
No	Reference	Reference	Reference
Yes	**1.72 (1.31–2.25)***	**1.73 (1.33–2.25)***	**2.06 (1.57–2.70)***
Interaction: C-section × Private facility			
Non-private × C-section	-	-	**2.06 (1.57–2.70)***
Private × vaginal birth	-	-	**1.69 (1.36–2.11)***
Private × C-section	-	-	1.48 (0.76–2.86)
Early initiation of breastfeeding			
No	Reference	Reference	Reference
Yes	**0.37 (0.33–0.42)***	**0.37 (0.33–0.42)***	**0.37 (0.32–0.43)***
Immediate postnatal care (PNC) for the newborn			
No	Reference	Reference	Reference
Yes	0.96 (0.82–1.12)	0.96 (0.82–1.13)	0.98 (0.82–1.17)
Sex of infant			
Male	Reference	Reference	Reference
Female	1.01 (0.92–1.12)	1.02 (0.92–1.13)	0.97 (0.85–1.10)
Birth order			
1st child	Reference	Reference	Reference
2nd or higher child	0.92 (0.79–1.08)	0.91 (0.78–1.07)	0.87 (0.72–1.05)
Large-sized baby			
No	Reference	Reference	Reference
Yes	1.18 (0.89–1.55)	1.17 (0.88–1.55)	1.33 (0.97–1.83)
Women's access to media			
No	Reference	Reference	Reference
Yes	1.19 (0.92–1.44)	1.19 (0.91–1.43)	1.11 (0.90–1.38)
Residential area			
Urban	Reference	Reference	Reference

Table 2 (continued)

Characteristics	AOR (95%CI) Model I	AOR (95%CI) Model II	AOR (95%CI) Model III **
Rural	**1.27 (1.06–1.54)***	**1.25 (1.04–1.51)***	1.22 (0.99–1.51)
Wealth status			
Lowest quintile	Reference	Reference	Reference
Second	0.93 (0.79–1.09)	0.99 (0.79–1.24)	0.88 (0.70–1.11)
Third	**1.24 (1.04–1.47)***	1.08 (0.84–1.39)	**1.35 (1.08–1.68)***
Fourth	**1.34 (1.11–1.61)***	1.30 (0.94–1.78)	**1.38 (1.10–1.74)***
Highest quintile	**1.34 (1.01–1.76)***	1.17 (0.62–2.22)	**1.42 (1.04–1.93)***
Interaction: Government HF × Wealth			
GovHF × Poorest	-	0.80 (0.62–1.01)	-
GovHF × 2nd	-	**0.69 (0.54–0.88)***	-
GovHF × 3rd	-	1.11 (0.88–1.40)	-
GovHF × 4th	-	1.17 (0.93–1.47)	-
GovHF × Highest	-	1.29 (0.95–1.74)	-
Interaction: Private HF × Wealth			
Private × Poorest	-	**1.98 (1.17–3.38)***	-
Private × 2nd	-	**1.75 (1.12–2.73)***	-
Private × 3rd	-	**2.11 (1.39–3.22)***	-
Private × 4th	-	**1.68 (1.09–2.59)***	-
Private × Richest	-	1.28 (0.80–2.03)	-

**Model 3 was estimated among facility births only, as cesarean delivery cannot occur among home births. Models II and III include interaction terms. Reported estimates for these models are stratum-specific adjusted odds ratios derived from the corresponding interaction models

Abbreviations: *AOR* Adjusted odds ratio, *CHW* Community healthcare worker, *CI* Confidence interval, *TBA* Traditional birth attendants

*$p < 0.05$. Significant values are in bold

has been consistently reported to be a strong predictor of IYCF practices [33, 34]. Maternal education likely enhances awareness of colostrum's benefits, correct breastfeeding techniques, and the risks associated with prelacteal feeds [5, 11, 18, 34]. In Afghanistan, multiple studies have demonstrated that maternal schooling correlates with improved maternal, newborn, and child health outcomes [5, 23, 35]. However, the recent restrictions imposed on women's education may have dire consequences in the years ahead [36]. Therefore, the findings of this study reinforce the need to continue advocating for women's education in Afghanistan. Moreover, targeted awareness and educational programs should be given a more prominent place in policy efforts and interventions focused on improving breastfeeding practices in Afghanistan, especially for less-educated women.

PLF is a significant predictor of delayed initiation of breastfeeding [37]. We also observed that mothers who initiated breastfeeding early had lower odds of practicing PLF. This association has been consistently reported across studies in LMICs [1, 18, 37, 38]. In Afghanistan, cultural and religious practices often delay early breastfeeding initiation [23, 39]. Despite the well-established benefits of early initiation of breastfeeding [40], only 46.9% of Afghan women initiated breastfeeding within the first hour of birth [5]. Since early suckling promotes prolactin release, successful latching, and mother–child bonding, policies should prioritize hospital and community-level initiatives that enable skin-to-skin contact and immediate breast attachment [5]. For instance, training health workers in both public and private facilities to encourage uninterrupted mother–infant contact immediately postpartum can reduce PLF and improve exclusive breastfeeding rates.

The odds of PLF practice were 1.27 times greater in women residing in rural areas than those living in urban areas. Similar rural–urban differentials have been documented in Nigeria [41], Ethiopia [18], and Bangladesh [42]. In some rural communities, prelacteal feeds are considered a family tradition for socialization [11]. Rural-urban disparities in maternal and child healthcare utilization have been documented in earlier Afghan studies [39, 43, 44]. Moreover, lower rates of early initiation of breastfeeding have been reported among Afghan rural women [5]. Such disparities in the Afghan context may be a result of several factors, including health literacy, access to healthcare, and entrenched cultural beliefs, affecting rural populations [23, 45]. A study identified insufficient milk supply and small baby size as key drivers of PLF [46], factors that are highly relevant in the Afghan context. Further studies, especially qualitative research, are needed to explore barriers to early breastfeeding initiation beyond cultural factors and to develop practical, context-specific strategies that address urban-rural disparities in breastfeeding practices in Afghanistan.

We observed that women who delivered in a private health facility were more likely to give prelacteal feeds to their children compared to those who delivered at home, a finding that contrasts with several LMIC studies reporting higher PLF rates among home births [11, 18, 38, 41]. This association warrants careful interpretation. In the Afghanistan MICS, the category "private health facility" encompasses all non-government delivery settings but does not distinguish between accredited private hospitals and smaller or informal private clinics, nor does it capture facility-level quality indicators such as breastfeeding support practices, adherence to Baby-Friendly Hospital Initiative standards, or exposure to breast-milk substitute promotion. As a result, the observed association should not be interpreted as evidence of uniformly poor quality across the private sector. It is also important to consider the limited population share of private-facility births. In this study, approximately 10% of deliveries occurred in private facilities, suggesting that the population-level contribution of private-sector delivery to PLF practice may be modest even when relative odds are elevated. Nonetheless, the consistency of the association across wealth groups, together with the interaction analysis, indicates that the higher prevalence of PLF among wealthier women is largely explained by differential use of private maternity services rather than household wealth itself. Once place of delivery was taken into account, the wealth gradient flattened, indicating that private-sector practices, rather than socioeconomic status per se, may be the primary drivers of PLF among wealthier women. Previous research from Afghanistan suggests heterogeneity in maternal and newborn care practices within the private health sector, with some studies reporting challenges related to adherence to national clinical guidelines, availability of breastfeeding counseling, and opportunities for continuing professional development among providers [39, 45, 47–49]. These findings do not imply that all private facilities provide substandard care but instead point to variability in service quality across diverse private settings. In this context, strengthening supportive regulatory frameworks and professional oversight, such as the roles of national bodies including the Afghanistan Nurses and Midwives Council and the Medical Council, may help promote more consistent standards of maternity and newborn care [49, 50]. Given the continued growth of private healthcare in Afghanistan and existing constraints on health-system oversight, proportionate and targeted approaches are likely to be more feasible and effective than blanket regulatory measures. Stratified monitoring, accreditation-linked supervision, and routine on-site breastfeeding counseling within private maternity facilities may help address early feeding practices without assuming uniform deficiencies across the sector. Such focused quality-assurance strategies may be particularly relevant in the current context of reduced technical support and constrained health-system resources, where prioritization of high-impact, facility-level interventions is essential.

Consistent with earlier studies [18, 38, 40], cesarean section was positively associated with PLF; infants born via cesarean delivery were more likely to receive prelacteal feeds than those born vaginally. Prior research in Afghanistan has also documented that cesarean births are linked to delayed initiation of breastfeeding [5] and reduced likelihood of immediate skin-to-skin contact [39]. These patterns are often explained by post-operative maternal and neonatal instability, delayed mother–infant contact due to recovery, positioning challenges, and insufficient breastfeeding support from healthcare providers, all of which can contribute to early supplementation [51]. Evidence indicates that improving breastfeeding outcomes following cesarean delivery requires enhanced post-operative care emphasizing early mother–infant contact, adequate pain management, and skilled lactation support [52]. Our interaction analysis further clarifies this relationship by demonstrating that, although both cesarean delivery and private facility birth independently increased the odds of PLF, the combined effect of cesarean section within private facilities was not significantly different from what would be expected based on their separate effects. This finding suggests that the higher prevalence of PLF observed in private facilities is not attributable to their elevated cesarean rates. Instead, private facilities appear to maintain consistently high PLF levels regardless of mode of delivery, pointing to underlying facility-level practices, such as insufficient breastfeeding counseling, inadequate early lactation support, or the availability and promotion of breast milk substitutes, as more likely drivers of early supplementation in these settings.

Additionally, our findings showed that the relationship between household wealth and PLF was modified by place of delivery. In the main-effects model, women from higher wealth quintiles had greater odds of practicing PLF compared with those from the poorest households. However, the interaction analysis revealed that this socioeconomic gradient did not operate uniformly across delivery settings. Wealth differences were modest among home and public facility births, whereas the strongest associations between wealth and PLF were observed in private health facilities, particularly among women in the middle to fourth wealth quintiles. In Afghanistan, wealthier women may have greater access to refined commodities (such as sugar) or to prepared traditional remedies within wealthier households, rather than a shift to commercial substitutes. Furthermore, adherence to specific urban or elite ritual practices, such as the use of Zamzam water or Karbala clay, may be more financially

or socially accessible to wealthier families [17, 23, 44]. At the same time, private facilities, where wealthier women disproportionately seek care, may reinforce these perceptions through inconsistent breastfeeding counseling or the inappropriate promotion of breast milk substitutes. These results underscore the need for tailored communication strategies that address misconceptions about the desirability of "high-status" feeds and the perceived insufficiency of breast milk, particularly among wealthier urban and peri-urban populations [53, 54].

Finally, although the broader sociopolitical situation has been noted elsewhere in the manuscript, it is important to emphasize that the findings of this study are closely linked to Afghanistan's unique context during the 2022–2023 period. Following the 2021 political transition, substantial reductions in international funding, suspensions of girls' secondary education, and limitations imposed on women's employment may have weakened the national health system and disrupted service delivery [55, 56]. These conditions likely shaped maternal health behaviors, the availability of skilled lactation support, and even the quality of data collection, as women's restricted mobility and limited access to female interviewers may have influenced reporting patterns. Therefore, the patterns of PLF practice observed in this analysis should be interpreted as reflecting both individual- and system-level responses to Afghanistan's post-2021 health environment, rather than as stable national trends.

Limitations

This study has some limitations. First, we acknowledge that the outcome variable definition in the MICS survey does not fully align with the WHO's definition. However, this is the most pragmatic approach to identifying PLF practice in large national surveys [25–27]. Second, the likelihood of information and recall bias cannot be avoided, as the MICS data were based on self-reports. Third, some factors, such as breastfeeding intention, breastfeeding knowledge, maternal beliefs about milk sufficiency, influence of elders or mothers-in-law, lack of knowledge of PLF risks, and religious interpretations of feeding practices, which have reportedly been associated with PLF practice [1, 7, 10, 30], were not available in the MICS dataset, which should be considered a limitation of the study. Fourth, the wealth index derived from household asset ownership has inherent limitations, as it does not capture income, debt, or consumption and may be subject to reporting bias, including underreporting in anticipation of humanitarian assistance or overreporting to convey higher social status. In addition, the cross-sectional design limits causal inference and precludes establishing temporal relationships between exposures and PLF practice. Early initiation of breastfeeding is temporally and biologically proximate to PLF and may lie on the causal pathway for delivery-related factors such as cesarean section and place of delivery; thus, its inclusion in multivariable models may have resulted in some degree of overadjustment. Nevertheless, sensitivity analyses excluding early initiation of breastfeeding produced consistent findings (Supplementary Table S2), supporting the robustness of the main results. Finally, residual confounding due to unmeasured factors, such as facility-level practices or provider counseling, cannot be ruled out.

Despite the limitations noted above, our study is the first to explore PLF practice in Afghanistan. Moreover, we used data from a nationally representative sample, which makes our findings generalizable to the country.

Conclusion

The 33.3% prevalence of PLF practice in Afghanistan highlights a substantial gap in optimal newborn feeding practices. This study identifies maternal education, early initiation of breastfeeding, rural residence, cesarean delivery, and private-facility birth as key determinants of PLF practice. To reduce PLF practice, interventions should prioritize integrating breastfeeding education into women's literacy and vocational programs, strengthening post-cesarean care bundles that promote immediate skin-to-skin contact and timely lactation support, and enforcing accreditation standards with routine on-site breastfeeding counseling in private maternity facilities. In rural areas, deploying community health workers to address traditional PLF practices and support early breastfeeding initiation is essential. Broader strategies, such as community or religious engagement, may be contextually relevant but should be considered complementary rather than core policy actions, as they were not directly assessed in this analysis. Implementation of these strategies must be considered within Afghanistan's current sociopolitical context, where restrictions on women's education and reductions in international health funding may constrain program reach and sustainability. Strengthening evidence-based, facility- and community-level breastfeeding support remains critical to improving early and exclusive breastfeeding practices in Afghanistan.

Abbreviations

ANC	Antenatal care
AOR	Adjusted odds ratio
APR	Adjusted prevalence ratio
CHW	Community healthcare worker
CI	Confidence interval
IYCF	Infant and young child feeding
LMICs	Low and middle-income countries
MICS	Multiple Indicator Cluster Survey
MNCH	Maternal, newborn, and child health
PLF	Prelacteal feeding
PNC	Postnatal care
TBA	Traditional birth attendant
WHO	World Health Organization

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s40795-026-01258-8.

Supplementary Material 1.

Acknowledgements
We thank the UNICEF for allowing us to access and analyze this data.

Authors' contributions
Conceptualization and design: MHS and ET. Analysis: ET, MHS, FD, and OD. Writing- original draft: MHS, ET, MJ, and ZE. Writing- review & editing: MHS, ET, AWW, FD, NF, ZE, MJ, and OD. All authors have read and approved the final manuscript.

Funding
None.

Data availability
The MICS 2022-23 dataset is publicly available on UNICEF's official website through the following link: https://mics.unicef.org/surveys?display=card&keys=Afghanistan.

Declarations

Ethics approval and consent to participate
Ethical approval for this study was waived by the Research and Ethics Committee of the Department of Public Health, Faculty of Medicine, Kandahar University, as the analysis was based on secondary data obtained from the 2022–2023 Multiple Indicator Cluster Survey (MICS). The original MICS survey received ethical approval from Afghanistan's Ministry of Public Health and UNICEF. The MICS survey protocols included obtaining informed consent from all participants prior to data collection. In the case of children, informed consent was secured from a parent or legal guardian. Moreover, the study adheres to the Declaration of Helsinki.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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Received: 1 June 2025 / Accepted: 16 January 2026
Published online: 22 January 2026

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