

Determinants of the Introduction of Pre-lacteal Feeds in Rural Nepal: a Cross-sectional Community Based Study

Vishnu Khanal¹, Kay Sauer^{2,3}

¹MPH (student), School of Public Health, Curtin University;

²School of Public Health, Curtin University

³Centre for Behavioural Research in Cancer Control, Curtin University

Corresponding Author

Vishnu Khanal

MA, MPH (student), School of Public Health, Curtin University, Perth, Australia

63 Jackson Road, Karawara, Western Australia 6152, Australia.

Phone: +61-430961429

Email: khanal.vishnu@gmail.com

Conflict of interest

We declare we have no conflict of interest.

Key Words: Pre-lacteal feeds, Nepal, Cross sectional Study, Exclusive Breastfeeding, Prevalence, Determinants

Determinants of the Introduction of Prelacteal Feeds in Rural Nepal: a Cross-sectional Community Based Study

Dear Editor:

INTRODUCTION. The health benefits of exclusive breastfeeding for infants and mothers are well known. Breastmilk provides nutrition and protection from gastroenteritis, respiratory illness, type II diabetes (1) and leukaemia (2). Further, it can enhance the neuro-cognitive development of the child (3). The World Health Organization (WHO) and United Nations Children's Fund (UNICEF) recommend exclusive breastfeeding for the first six months and the continuation of breastfeeding thereafter (4). They recommend that initiation of breastfeeding should occur within the first hour of birth to increase child survival. WHO and UNICEF guidelines state that nothing should be provided to the child before initiating breastfeeding (5). Despite this, the practice of introducing prelacteal feeds to the newborn is still prevalent in many countries across the South East Asia region (6-9). Prelacteal feeds include any food introduced to the newborn prior to the introduction of mother's milk within the first three days (6, 8). Such foods might include ghee (refined butter), honey, sugar solution, or ghutti (herbal paste) amongst others. (6). The introduction of prelacteal feeds has been shown to adversely affect the duration of breastfeeding, may contribute to the development of infections and cause indigestion in newborns (10, 11). The Nepal Demographic and Health Survey reported that 28% of the children in Nepal are provided prelacteal feeds within first three days of their life (12), however, the social determinants surrounding the introduction of prelacteal feeds in Nepal have not be identified.

To better understand why prelacteal feeding is occurring, a cross-sectional study was undertaken to measure the prevalence of prelacteal feeding and to identify their underlying

determinants in the Kapilvastu district of Western Nepal between November and December 2010.

METHOD. The Kapilvastu district has a population of 570,612 with one hospital, 384 outreach clinics and 1054 female community health volunteers (FCHVs) (13). This study was part of a larger social mobilisation program - Community Action Process which included 10 of the 77 Village Development Committees (VDCs) in the district (13). A list of households was obtained from the local VDC office and households were selected using the WHO "lot quality assurance sampling survey guideline" (14, 15). Only those mothers whose child was between 12 and 23 months were included in the current study. Ethical approval was obtained from the Nepal Health Research Council.

For the purpose of this study any food except for mother's milk or a wet nurse's milk was classified as a prelacteal feed. It excluded medicine, water and oral rehydration solution.

Ethnicity in Nepal is based on a caste system and groups are divided into three distinct ethnic groups: Hill origin (Brahmins, Chhetri and Thakuri); Terai origin (Madhesi, Tharu and Muslim); and Dalit, Janjati and others (16, 17). The term "health workers" refers to a doctor, nurse, health assistant, auxiliary nurse midwife, auxiliary health worker or maternal and child health worker (7). Birth preparedness was defined based on whether the mother had taken some action or planned for at least one of the following for their child's birth : seeking a health worker's help; saving money; identifying a place for the mother after delivery; identifying a place to go for emergency; transportation; identifying a person to donate blood if the mother needed to undergo a caesarean section or make arrangements for a helper at home (18).

RESULTS. Of the 190 mothers interviewed, 39% introduced prelacteal feeds within the first three days of birth. The most common prelacteal foods were sugar water, sugarcane juice and

honey. Only 30% of the births took place in a health facility. The majority (66%) of mothers reported taking at least one action to prepare for the birth of their child. (Table 1)

.....insert table 1 about here.....

The age of mother, their ethnicity, antenatal visits, mother's educational level, initiation of breastfeeding, a household with toilets and degree of birth preparedness were significantly associated with introduction of prelacteal feeds in chi-square analysis (Table 2). However, only time of initiation of breastfeeding and birth preparedness were statistically significant in the final regression model after controlling for mother's age, ethnicity, antenatal visits, education level, and living in a household with a toilet (Table 3). It was found that the mothers who breastfed their children within one hour of birth were significantly less likely to introduce prelacteal feeds to their children [OR=0.072, 95% CI (0.032-0.164)]. The large variation in 95% confidence interval may be due to the small sample size. The mothers who did not prepare for their child's birth were almost three times more likely to introduce prelacteal feeds to their children [OR 2.779, 95% CI (1.325-5.830)] (Table 2).

.....insert table 2 and 3 about here.....

DISCUSSION. Initiation of breastfeeding within the first hour of birth is the recommended practice (4, 5), however, many mothers introduce other foods before introducing breastmilk to their babies (prelacteal feeds (10)). The prevalence of prelacteal feeding in Nepal was reported at 28% during 2011 and 15.2 % during 2006 (12, 19). While these two findings are much lower than the current finding of 39%, a study from less developed communities in Pakistan reported a prevalence of prelacteal feeds of 55% (20). Similarly, a cohort study from China reported 34% (21). Therefore, this finding is comparable to these other Asian and Nepalese studies.

The majority of the deliveries in this study took place at home. Mother-in-laws and other senior women are usually involved in assisting with such deliveries. The importance of an older women's influence on the introduction of prelacteal feeds and the initiation of breastfeeding has been reported in other studies (7, 21, 22). Another important factor to consider in the current study setting is that the subjects were predominantly Hindu with a small proportion of Muslims. Religious practice and traditions could be another explanation for a higher prevalence of prelacteal feeds because *Sushruta Samhita* (Hindu script) promotes prelacteal feeds as a major religious ritual after childbirth (6). Similarly Islam (Muslim) culture also promotes introduction of prelacteal feeds (23).

Initiation of breastfeeding within one hour of birth was associated with lower odds of the introduction of prelacteal feeding. This gives further strength to promoting the practice of putting newborn to their mother's breast as early as possible after birth. Having prepared for the birth of their child was found to be a significant determinant for not introducing prelacteal feeds. Therefore, promoting birth preparedness which encourages face to face counselling during antenatal visits with an emphasis on encouraging exclusive breastfeeding for the first six months could further reduce the prevalence of prelacteal feeds.

The Baby Friendly Hospital Initiative (BFHI) encourages the early initiation of breastfeeding and discourages the introduction of prelacteal feeds and formula feeding (5, 24). This has been shown to be an effective strategy to encourage exclusive breastfeeding and increase the duration of breastfeeding (25). According to the BFHI, promotion of breastfeeding should start from the first antenatal visit. Unfortunately, this study did not find that having antenatal care or giving birth at a health facility a factor in reducing the prevalence of prelacteal feeding practices. It was beyond the scope of this study to determine the degree to which BFHI guidelines was followed.

The current study provides evidence that there is a need to further promote the BFHI guidelines in rural health facilities (deliveries). It also supports the need to include counselling sessions during the prenatal period that discourage prelacteal feeds and encourage early initiation of breastfeeding soon after birth. The effectiveness of such prenatal counselling has been proven in longitudinal studies (26, 27). A health promotion approach on maternal and newborn care commenced in Nepal in 2002. It included the production and distribution of a booklet called “Jeevan Suraksha” (literally *safe life* but called *Birth Preparedness*) for pregnant women (28). Unfortunately, the message to avoid prelacteal feeds was not included. It is recommended that all future breastfeeding promotion in Nepal should stress the importance of avoiding prelacteal feeds. A revision of this booklet should also be considered to reflect such advice.

A relatively small sample size and limited data on socio-demographic variables of participants are two potential limitations of the study. The cross sectional study design also limits drawing causal inference. Nevertheless the findings on prelacteal feeding do identify a need for better breastfeeding promotion in the Nepal. It further highlights the importance of targeting education messages for specific population groups as this study found that Hindus’ may be more likely to introduce prelacteal feeds, possibly due to their religious beliefs.

While BFHI is an agreed policy of the health system of Nepal; therefore there appears to be considerable scope for the strengthening and providing better support of the policy in health facilities.

Acknowledgement: Respondents, UNICEF Nepal and District Health Office, Kapilvastu.

References

1. Pettitt DJ, Forman MR, Hanson RL, Knowler WC, Bennett PH. Breastfeeding and incidence of non-insulin-dependent diabetes mellitus in Pima Indians. *Lancet*. 1997;350(9072):166-8. Epub 1997/07/19.
2. Jones ME, Swerdlow AJ, Gill LE, Goldacre MJ. Pre-natal and early life risk factors for childhood onset diabetes mellitus: a record linkage study. *Int J Epidemiol*. 1998;27(3):444-9. Epub 1998/08/11.
3. Kramer MS. "Breast is best": The evidence. *Early Human Development*. 2010;86(11):729-32.
4. The World Health Organization. Indicators for Assessing Infant and Young Child Feeding Practices. Part 2. Measurements. . Geneva: The World Health Organization, 2008.
5. UNICEF. Baby Friendly Hospital Initiative (BFHI). 2012 [13 August, 2012]; Available from: http://www.unicef.org/nutrition/index_24806.html.
6. Laroia N, Sharma D. The Religious and Cultural Bases for Breastfeeding Practices Among the Hindus. *Breastfeeding Medicine*. 2006;1(2):94-8.
7. Osrin D, Tumbahangphe KM, Shrestha D, Mesko N, Shrestha BP, Manandhar MK, et al. Cross sectional, community based study of care of newborn infants in Nepal. *BMJ*. 2002;325(7372):1063. Epub 2002/11/09.
8. Chandrashekhara TS, Joshi HS, Binu VS, Shankar PR, Rana MS, Ramachandran U. Breast-feeding initiation and determinants of exclusive breast-feeding - a questionnaire survey in an urban population of western Nepal. *Public health nutrition*. 2007;10(2):192-7.
9. Duong DV, Binns CW, Lee AH. Breast-feeding initiation and exclusive breast-feeding in rural Vietnam. *Public Health Nutr*. 2004;7(6):795-9. Epub 2004/09/17.
10. Qiu L, Xie X, Lee A, Binns CW. Infants' first feeds in Hangzhou, PR China. *Asia Pacific journal of clinical nutrition*. 2007;16 Suppl 1:458-61. Epub 2007/03/30.

11. Rogers NL, Abdi J, Moore D, Nd'iangui S, Smith LJ, Carlson AJ, et al. Colostrum avoidance, prelacteal feeding and late breast-feeding initiation in rural Northern Ethiopia. *Public health nutrition*. 2011;14(11):2029-36. Epub 2011/05/12.
12. Ministry of Health and Population (MOHP) [Nepal], New ERA, ICF International Inc. Nepal Demographic and Health Survey 2011. Kathmandu, Nepal :Ministry of Health and Population, New ERA, and ICF International, Calverton, Maryland: 2012.
13. Central Bureau of Statistics. District Profile Kapilvastu. Kathmandu (Nepal): Central Bureau of statistics, 2010 Contract No.: 10 Nov.2010.
14. The World Health Organization. Monitoring Immunization Services Using Lot Quality Techniques. Technical Guide. Geneva: WHO 1996 Contract No.: WHO/VRD/TRAM/96.01.
15. The World Health Organization. Training for mid-level managers (MLM) The EPI coverage survey Geneva: 2008 Contract No.: WHO/IVP/08.07.
16. Bhandari R, Sharma R. Epidemiology of chronic obstructive pulmonary disease: a descriptive study in the mid-western region of Nepal. *Int J Chron Obstruct Pulmon Dis* 2012;7:253-7.
17. Suvedi BK, Pradhan A, Barnett S, Puri M, Rai Chitrakar S, Poudel P, et al. Nepal Maternal Mortality and Morbidity Study 2008/2009,. Kathmandu [Nepal]: Family Health division, Department of Health Services, Ministry of Health, Government of Nepa, 2009.
18. McPherson RA, Khadka N, Moore JM, Sharma M. Are birth-preparedness programmes effective? Results from a field trial in Siraha district, Nepal. *J Health Popul Nutr*. 2006;24(4):479-88. Epub 2007/06/27.
19. Sreeramareddy CT, Joshi HS, Sreekumaran BV, Giri S, Chuni N. Home delivery and newborn care practices among urban women in western Nepal: a questionnaire survey. *BMC Pregnancy Childbirth*. 2006;6:27. Epub 2006/08/25.

20. Khadduri R, Marsh DR, Rasmussen B, Bari A, Nazir R, Darmstadt GL. Household knowledge and practices of newborn and maternal health in Haripur district, Pakistan. *J Perinatol*. 2008;28(3):182-7. Epub 2007/12/07.
21. Zhao Y, Niu AM, Xu GF, Garrett MJ, Greiner T. Early infant feeding practices in Jinan City, Shandong Province, China. *Asia Pac J Clin Nutr*. 2003;12(1):104-8.
22. Masvie H. The role of Tamang mothers-in-law in promoting breast feeding in Makwanpur District, Nepal. *Midwifery*. 2006;22(1):23-31.
23. McKenna KM, Shankar RT. The Practice of Pre-lacteal Feeding to Newborns Among Hindu and Muslim Families. *The Journal of Midwifery & Women's Health*. 2009;54(1):78-81.
24. Haiek LN. Measuring compliance with the Baby-Friendly Hospital Initiative. *Public health nutrition*. 2012;15(05):894-905.
25. Labbok MH. Breastfeeding and Baby-Friendly Hospital Initiative: more important and with more evidence than ever. *J Pediat*. 2007;83(2):99-101.
26. Aidam BA, Pérez-Escamilla R, Lartey A. Lactation Counseling Increases Exclusive Breast-Feeding Rates in Ghana. *The Journal of Nutrition*. 2005;135(7):1691-5.
27. Imdad A, Yakoob MY, Bhutta ZA. Effect of breastfeeding promotion interventions on breastfeeding rates, with special focus on developing countries. *BMC Public Health*. 2011;11(3):S24. Epub 2011/04/29.
28. McPherson RA, Tamang J, Hodgins S, Pathak LR, Silwal RC, Baqui AH, et al. Process evaluation of a community-based intervention promoting multiple maternal and neonatal care practices in rural Nepal. *Bmc Pregnancy and Childbirth*. 2010;10.

Table 1. Description of the study variables

Variables	Categories	N	%
Prelacteal feeds	No	116	61.1
	Yes	74	38.9
Age of Mothers (188)	Less than 20	7	3.7
	20-32 years	145	77.1
	33 and above	36	19.1
Religion	Muslim	13	6.8
	Hindu	177	93.2
Ethnicity	Hilly Origin	48	25.3
	Dalit Janjati	109	57.4
	Terai origin	33	17.4
Sex of child =182	Male	97	53.3
	Female	85	46.7
Place of delivery	Health Facilities	57	30.0
	Others	133	70.0
Delivery assistance	Health Workers	75	39.5
	Others	115	60.5
Antenatal visit n=189	One to three visits	111	58.7
	4 or more visits	64	33.9
	No visit at all	14	7.5
Involvement in Community Based Organisation =186	Yes	64	34.4
	No	122	65.6
Education level	No school education	91	47.9
	Some school up to high school	76	40.0
	Higher secondary school	23	12.1
Initiation of breastfeeding after birth	Not Within one hour	86	45.3
	within one hour	104	54.7
Household having toilets	Yes	83	43.7
	No	107	56.3
Birth preparedness	Yes	124	65.3
	No	66	34.7

Table 2. Factor associated with introduction of prelacteal feeds: Univariate analysis

Variables	Categories	Prelacteal feeds [%]		Chi square test
		Yes	No	
Age of mothers 188	Less than 20	3 [42.9]	4 [57.1]	P=0.003*
	20-32 years	48 [33.1]	97 [66.9]	
	33 and above	23 [63.9]	13 [36.1]	
Religion	Muslim	6 [69.2]	4 [30.8]	P=0.02*
	Hindu	65 [36.7]	112 [63.3]	
Ethnicity	Hilly Origin	8 [16.7]	40 [83.3]	P<0.001*
	Dalit Janjati	54 [49.5]	55 [50.5]	
	Terai origin	12 [36.4]	21 [63.6]	
Sex of child =182	Male	35 [36.1]	62 [63.9]	P=0.305
	Female	37 [43.5]	48 [56.5]	
Place of delivery	Health Facilities	19 [33.3]	38 [66.7]	P=0.299
	Others	55 [41.5]	78 [58.6]	
Delivery assistance	Health Workers	46 [40.0]	69 [60.0]	P=0.713
	Others	28 [37.3]	47 [62.7]	
Antenatal visit n=189	One to three visits	55 [49.5]	56 [50.5]	P=0.001*
	4 or more visits	14 [21.9]	50 [78.1]	
	No visit at all	4 [28.6]	10 [71.4]	
Involvement in Community Based Organisation =186	Yes	21[32.8]	43 [67.2]	P=0.159
	No	53 [43.4]	69 [56.6]	
Education level	No school education	43 [47.3]	48 [52.7]	P=0.023*
	Some school up to high school	27 [35.5]	49 [64.5]	
	Higher secondary school	4 [17.4]	19 [82.6]	
Initiation of breastfeeding after birth	Not Within one hour	64 [61.5]	40 [38.5]	P<0.001*
	within one hour	10 [11.6]	76 [88.4]	
Household Having toilets	Yes	19 [22.9]	64 [77.1]	P<0.001*
	No	55 [51.4]	52 [48.6]	
Birth Preparedness	Yes	39 [31.5]	85 [68.5]	P=0.004*
	No	35 [53.0]	31 [47.0]	

*statistically significant at $p<0.05$

Table 3. Factor Associated with Introduction of Prelacteal Feeds: Multivariate Analysis

Factors	Categories	Prelacteal Feeds	Unadjusted Odd ratio			Adjusted Odd ratio		
			OR	95 %CI	P value	OR	95 %CI	P value
		Yes						
Age of mothers 188	Less than 20	3 [42.9]	1.00		P=0.005*	1.00		P=0.241
	20-32 years	48 [33.1]	0.660	0.142-3.067		0.637	0.078-5.193	
	33 and above	23 [63.9]	2.395	0.456-12.212		1.437	0.157-13.147	
Religion	Muslim	6 [69.2]	1.00		P=0.029*	1.00		P=0.487
	Hindu	65 [36.7]	0.258	0.076-0.871		0.553	0.104-2.943	
Ethnicity	Hilly Origin	8 [16.7]	1.00		P=0.001*	1.00		P=0.314
	Dalit Janjati	54 [49.5]	4.909	2.105-11.450		1.575	0.439-5.655	
	Terai origin	12 [36.4]	2.857	1.011-8.074		0.744	0.179-3.090	
Antenatal visit n=189	One to three visits	55 [49.5]	1.00		P=0.001*	1.00		P=0.410
	4 or more visits	14 [21.9]	0.285	0.142-0.574		0.743	0.278-1.987	
	No visit at all	4 [28.6]	0.407	0.121-1.376		0.382	0.088-1.663	
Education level	No school education	43 [47.3]	1.00		P=0.030*	1.00		P=0.42
	Some school up to high school	27 [35.5]	0.615	0.329-1.149		1.396	0.582-3.346	
	Higher secondary school	4 [17.4]	0.235	0.074-0.745		0.745	0.162-3.430	
Initiation of breastfeeding after birth	Not within one hour	64[61.5]	1.00		P<0.001*	1.00		P<0.001*
	Within one hour	10 [11.6]	0.082	0.038-0.177		0.072	0.032-0.164	
Household having toilets	Yes	19 [22.9]	1.00		P<0.001*	1.00		P=0.778
	No	55 [51.4]	3.563	1.884-6.737		1.183	0.423-3.305	

Birth preparedness	Yes	39 [31.5]	1.00		P=0.004*	1.00		P=0.007*
	No	35 [53.0]	2.461	1.331-4.548		2.779	1.325-5.830	

Asterisk (*) denotes significant at $p < 0.05$

-2likelihood ratio of final model: 186.926, df; 3, Nagelkerke R square;0.384

Independent variables entered in initial model: Age of mother, religion, ethnicity, antenatal visits, educational status of mother, initiation of breastfeeding, households having toilets and birth preparedness.