

# Knowledge Regarding Human Milk Banking and its Acceptability among Mothers at Bharatpur Hospital, Chitwan, Nepal

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## ABSTRACT

**Background:** Human milk banking is a system that collects, processes, stores and donates breast milk to infants who are unable to receive breast milk from their biological mothers. It promotes optimal nutrition and health for vulnerable infants, particularly those who are premature, ill or have special medical conditions. This study aimed to assess the knowledge regarding human milk banking and its acceptability among mothers at Bharatpur Hospital, Chitwan, Nepal.

**Method:** A hospital based descriptive cross-sectional study carried out among 135 mothers admitted at postnatal ward of the hospital. Data collected from June 15 to July 15, 2023 by using structured interview questionnaires. All collected data entered and analyzed using statistical package for social sciences (SPSS) to assess the knowledge regarding human milk banking and its acceptability among mothers.

**Result:** The finding revealed that the mean age of respondents was 26.27(±4.92) year. Nearly half of respondents (49.6%) had average knowledge, 43% had poor knowledge, and only 7.4% had adequate knowledge regarding human milk banking. Likewise, most of (70.4%) the respondents expressed their acceptability toward human milk banking. There was significant association between ethnicity and level of knowledge. The level of knowledge was strongly correlated (r=0.846, p<0.001) with acceptability regarding human milk banking.

**Conclusion:** The study concluded that near about half of the respondents had average knowledge and few had adequate knowledge regarding human milk banking, though had more acceptability towards human milk banking. The finding suggests that to increase the knowledge on human milk banking to the mothers seen important to the public through health education.

**Key words:** knowledge; acceptability; mothers; human milk banking.

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## INTRODUCTION

Human breast milk is the most critical feeding option for newborns and infants. The World Health Organization recommends infant exclusive breastfeeding for the initial six months of life. WHO recommends the donation and use of human breast milk as the best of other replacement feeding options.<sup>1</sup> The world's first human milk bank was established in 1909, in Vienna, Austria. Asia's first human milk bank was set up at Lokmanya Tilak Municipal Hospital in 1989 and in Pune city in the Deenath Mangeshkar Hospital.<sup>2</sup> In Nepal first Human milk bank 'Amrit Kosh' opened in 2022 at the Paropakar Maternity and Women's hospital in Kathmandu. The center has established in partnership between the Government of Nepal the European Union and UNICEF.<sup>3</sup> Human milk banking refers to the collection, storage and processing of human milk donated by

lactating mothers for infants other than their own. Once pasteurized, milk is placed in small (100-150 mL) containers and is stored frozen for up to 1 year depending on local guidelines.<sup>4</sup> Some of the successful breastfeeding mothers produce breast milk more than the amount needed for their babies. These breastfeeding mothers welcomed the idea of breast milk donation and the establishment of breast milk banking. Therefore, breast milk donation can play an important role to satisfy the needs of those infants and compensate for the inadequate supply from their mothers.<sup>5</sup>

A study to assess the knowledge and attitude regarding human milk donation among 100 postnatal mothers in selected hospitals of Pune city. Among them majority of (66%) postnatal mothers had average knowledge, 26% poor knowledge and only 8% had good knowledge and regarding attitude, 36% postnatal

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mothers are having highly favorable attitude, 34% are having moderately favorable attitude and 30% are having unfavorable attitude regarding human milk donation.<sup>6</sup>

A study on knowledge and attitude on human milk banking conducted in three community health centers in southeast China, in December 2020 among 305 postpartum women, only 17% of participants had heard of human milk banking prior to this survey. The prevalence of willingness to donate and to receive human milk was 73.4% and 44.6% respectively.<sup>7</sup> A cross sectional study was carried out on 350 antenatal and postnatal women from three hospitals of Bhopal. The knowledge on existence of breast milk bank was 10% while willingness to accept the milk was 85.4% and willing to donate milk was 84.9% among the participants.<sup>8</sup> The concept of Human milk banking has existed worldwide for a long time, in Nepal, has recently introduced. Human milk banking can be a highly effective for those mothers who are unable to engage in exclusive breastfeeding. Therefore, it is importance to assess the knowledge and its acceptability among mothers regarding Human milk banking. In near future, study setting might be a possible center for human milk banking to compensate the needs of those infants who haven't on mothers' exclusive breast feeding, that's the study was carried out. The finding of the study might be useful as a source of baseline information for further researcher. Findings also identified the public view for establishing new human milk bank. It might be also helpful to concerned authorities for the planning and implementation of an awareness program on human milk banking.

## METHODS

A hospital based descriptive cross-sectional study carried out to assess the knowledge regarding human milk banking and its acceptability among mothers admitted at postnatal ward of Bharatpur Hospital, chitwan, Nepal. This hospital is one of the province government hospital where large number of mothers gave birth their child via vaginally or by caesarean section per year. In the study, 135 mothers who had normal vaginal delivery selected as study sample by

using non-probability purposive sampling technique. Ethical approval obtained from Institutional Review Committee Bharatpur Hospital Chitwan. Written consent was taken from each respondents after debriefing the study. Data collected from June 15 to July 15, 2023 by using structured interview questionnaires by face-to-face interview. Throughout the study the anonymity and confidentiality maintained. All collected data entered and analyzed

**Table 1. Socio demographic characteristics of the respondents. (n= 135)**

Characteristics	Frequency (%)
<b>Age (in complete year)</b>	
<20	9(6.7)
20-24	46(34.1)
25-29	41(30.4)
30-34	32(23.7)
35+	7(5.2)
Mean age (SD): 26.27(±4.92)	
<b>Education</b>	
Primary level	38(28.2)
Secondary Level	75(55.6)
Bachelor Level	18(13.2)
Master Level	4(3.0)
<b>Occupation</b>	
Government employee	5(3.7)
Private employee	10(7.4)
Business	12(8.9)
Homemaker	108(80.0)
<b>Ethnicity</b>	
Brahmin/Chhetri	40(29.6)
Janjati	81(60.0)
Madhesi	2(1.5)
Dalit	12(8.9)
<b>Religion</b>	
Hindu	115(85.2)
Christian	10(7.4)
Buddhist	9(6.7)
<b>Residential Area</b>	
Urban	63(46.7)
Rural	72(53.3)
<b>Monthly Income (in Rs)</b>	
Below 5,000	12(8.9)
5,000-20,000	34(25.2)
20,000-40,000	44(33.3)
Above 40,000	45(32.6)
<b>Current Gravidity</b>	
First gravida	58(43.0)
Second gravida	59(43.7)
Third or more	18(13.3)

using statistical package for social sciences (SPSS) to assess the knowledge regarding human milk banking and its acceptability among mothers.

## RESULTS

Out of 135 respondents, more than one third (34.1%) respondents belongs to age group 20-24 years and least 5.2% belongs to age group above 35 years. More than half (55.6%) respondents have completed the secondary level education. Majority (80%) of respondents were involved in homemaker and least (3.7%) were involved in government service. Concerning ethnicity majority of respondents (60%) were from Janjati. Majority of the respondents (85.2%) followed Hindu religion. More than half (53.3%) respondents were from rural area. Likewise, one-third (33.3%) respondents' monthly income was at the range of Rs. 20,000-40,000. Regarding obstetric history, first and second gravida mothers were 43% and 43.75% respectively (Table 1). Majority of respondents (79.3%) knew the meaning of exclusive breastfeeding. About recommended duration of exclusive breastfeeding and its important majority had knowledge on it (Table 2).

Knowledge on exclusive breast feeding	Frequency (%)
Meaning of exclusive breast feeding that infant receives only breast milk	107(79.3)
Recommended duration for exclusive breast feeding is 6 months	115(85.2)
Exclusive breast feeding provides essential nutrients and antibodies	117(86.7)

The finding depicts that majority of (78.5%) respondents knew the meaning of human milk banking. Similarly, near about two third (64.4%) respondents knew the purpose of human milk banking. Regarding process of HMB, 77.8% respondents gave correct response about method of collecting human milk banking. likewise, method of storing human milk in human milk banking more than half of (57.8%) respondents gave correct response. Near about one third (31.1%) respondents knew the method of pasteurization. Similarly, 38.5% respondents were knew the storage period of human milk (Table 3).

The findings reveal that more than half (53.3%)

respondents said that the reason for using donor breast milk is to supplement breast feeding when necessary. In regarding conditions for baby to receive

Variables	Frequency (%)
<b>Meaning and Purpose of Human Milk Banking (HMB)</b>	
HMB means collecting, processing and distribution of donated human breast milk for infants in need	106(78.5)
Providing safe donor breast milk to infants in need is purpose of HMB	87(64.4)
<b>Process of Human Milk Banking</b>	
In method of collecting human milk, donors self-express milk using breast pump	105(77.8)
In method of storing human milk, freezing the milk at extremely low temperature	78(57.8)
In method of pasteurization of human milk used of holder pasteurizer to heat the milk	42(31.1)
Storage period for human milk in milk bank is 6-12 months	52(38.5)

donated milk, 58.5 % answered to the premature baby. Likewise majority (96.3%) said human milk bank can used for exclusive breast-feeding for first 6<sup>th</sup> months. Most of the respondents (84.4%) were said need of human milk banking is, donated breast milk is more nutrients than other milk. Similarly, majority (94.1%) respondents responded about when a mother cannot produce enough milk for her baby HMB can recommended (Table 4).

Variables	Frequency (%)
<b>Main reason for baby to receive donated Milk</b>	
Reason for using donor breast milk is to supplement breast feeding when necessary	72(53.3)
<b>Conditions for baby to receive donated milk*</b>	
To the Premature baby	79(58.5)
To congenital anomalies baby	54(40.0)
To sick baby	28(20.7)
To Immune deficiencies baby	35(25.9)
<b>Need of human milk banking*</b>	
Can used human milk bank for exclusive breast feeding for first 6th months	130(96.3)
Donated breast milk is more nutrients than others milk	114(84.4)
When a mother cannot produce enough milk for her baby HMB can recommended	127(94.1)

\*Multiple response

Majority (87.4%) of the respondents said that proper screening of mothers to rule out health condition is the criteria to become a donor. Regarding condition for mother that cannot donate their breast milk, 67.4% answered infectious disease condition, 28.9% answered milk supply issues related to family stigma, and 19.3% answered consumption of alcohol and smoking (Table 5).

Variables	Frequency (%)
<b>Criteria of donor*</b>	
Proper screening of mothers to rule out health condition	118(87.4)
Health and lifestyle factors should be normal	90(66.7)
No specific age range required	57(42.2)
<b>Condition of mother that can't donate their breast milk*</b>	
Infectious disease condition	91(67.4)
Milk supply issue related to family stigma	39(28.9)
Consumption of alcohol and smoking	26(19.3)
Chronic medical condition	68(87.4)

Note: \*Multiple response

Out of 135, near about half of the respondents (49.6%) had average knowledge, 43% had poor knowledge, and only 7.4% had adequate knowledge. Therefore, it was necessary to increase awareness program on human milk banking, as the concepts of human milk banking is increasing day by day but only limited respondents had adequate knowledge on human milk banking (Table 6).

Level of knowledge	Frequency (%)
Poor knowledge (<60%)	58(43.0)
Average knowledge (60-79%)	67(49.6)
Adequate knowledge (80-100%)	10(7.4)
Mean (SD):15.78(±3.21)	

Regarding acceptability on human milk banking, more than two third of (71.9%) respondents were willing to donate human milk; majority of the respondents (91.9%) were give the reason to donate human milk is helping other infants. Most of (87.4%) had willing to accept donor milk for their baby if needed because it is nutritionally superior to formula milk. Some of (28.1%) were unwilling to donate human milk. The reason for unwilling to donate milk was they had

insufficient milk to donate others. A few (12.6%) who did not want to accept donor human milk due to the fear of inadequate health screening of donor. If they do not have enough breast milk, 83% respondents answered that they will feed their baby with someone else. Some (29.6%) received milk for their baby from other mothers and 28.9% had feed breast milk for other baby. Majority of (94.8%) respondents expressed the need to established HMB in health care institute and said that medical examination should be mandatory before accepted as a milk donor (Table 7). Majority (70.4%) of respondents had acceptability on human milk banking though most of them have average knowledge level regarding human milk banking. It suggests that human milk banking is need

Acceptability on	Frequency (%)
<b>Human milk donation</b>	
Willing to donate human milk	97(71.9)
Reason to willing to donate human milk is helping other infants	91(91.9)
Unwilling to donate human milk	38(28.1)
<b>Reason to unwilling to donate human milk* (n=38)</b>	
Milk is sufficient only for her baby	24(63.2)
Having no time	1(2.6)
Unknown about human milk banking	13(34.2)
<b>Willing to accept donor milk for their baby if needed</b>	
Reason to willing to accept donor human milk is, it is nutritionally superior to formula milk(n=118)	118(100)
Unwilling to accept donor human milk	17(12.6)
<b>Reason to unwilling to accept donor human milk*(n=17)</b>	
Formula milk is healthy compare to donate milk	7(5.2)
Inadequate health screening of donor	10(58.8)
Contamination of donor milk in the process of expressing	11(64.7)
<b>Other statement related to acceptability</b>	
Feed their baby with someone else if they don't have enough breast milk	112(83.0)
Require spousal consent before receiving donating breast milk	89(65.9)
Factors that affect the acceptability of HMB are safety and quality standards	81(60.0)
Need to established HMB in health care institute	128(94.8)
Important to establish HMB is valuable resource for babies who cannot receive their mother's milk	112(83)
Received breast milk for their baby from other mothers	40(29.6)
Donated their breast milk for other baby	39(28.9)
Medical examination is mandatory before being accepted as a milk donor	128(94.9)

Note: \*Multiple response



to establish in tertiary level hospital increasing the public awareness on it (Table 8).

Table 8. Level of acceptability regarding human milk banking. (n=135)	
Level of acceptability	Frequency (%)
Acceptability (> mean score)	95(70.4)
Not acceptability(≤ mean score)	40(29.6)
Mean SD: 9.21(±2.31)	

It showed that level of knowledge is statistically significant with ethnicity(  $p=0.010$ ) (Table 9).

Table 9. Association between level of knowledge and socio-demographic variables. (n=135)					
Variables	Adequate	Average	Poor	$\chi^2$	p-value
	f (%)	f (%)	f (%)		
<b>Educational qualification</b>					
Primary level	-	6 (9)	8 (13.8)	2.032	0.362
Secondary and above	10 (100)	61 (91)	50 (86.2)		
<b>Religion</b>					
Hindu	9 (90)	59 (88.1)	47 (81)	1.414	0.493
Other than Hindu	1 (10)	8 (11.9)	11 (19)		
<b>Ethnicity</b>					
Brahmin/Chhetri	7 (70)	20 (29.9)	13 (22.4)	9.266	0.01
Others	3 (30)	47 (70.1)	45 (77.6)		
<b>Residential area</b>					
Urban	6 (60)	34 (50.7)	23 (39.7)	2.308	0.315
Rural	4 (40)	33 (49.3)	35 (60.3)		
<b>Income</b>					
Below 40,000	5(5.6)	43(48.3)	41(46.1)	1.806	0.405
Above 40,000	5(10.9)	24(52.2)	17(37)		
<b>Number of children</b>					
First children	4 (40)	28 (41.8)	30 (51.7)	1.388	0.5
Two or more	6 (60)	39 (58.2)	28 (48.3)		
<b>Gravidity</b>					
Primigravida	4 (40)	27 (40.3)	27 (46.6)	0.535	0.765
Multigravida	6 (60)	40 (59.7)	31 (53.4)		

The level of acceptability is statistically not significant with sociodemographic variables (Table 10).

The finding showed that level of knowledge is strongly correlation (0.846) with acceptability regarding human milk banking (Table 11).

## DISCUSSION

This study was done to assess the knowledge and acceptability regarding human milk banking among mothers admitted in postnatal ward of Bharatpur hospital. In the study, among 135 respondents most of the respondents (34.1%) belongs to age group 20-24 years and least (5.2%) belongs to age group above 35 years and mean age was 26.27(±4.92)year whereas on the study by Kimani-Murage et al(2019),<sup>9</sup> majority (31.6%) of respondents were age group between

Table 10. Association between level of acceptability and socio-demographic variables. (n=135)				
Variables	Not acceptable	Acceptable	$\chi^2$	p-value
	n(%)	n (%)		
<b>Age (in complete year)</b>				
<20	3(7.5)	6(8.3)	2.44	0.486
20-24	17(42.5)	29(30.5)		
25-29	9(22.5)	32(33.7)		
≥30	11(27.5)	28(29.5)		
<b>Educational qualification</b>				
Primary level	4(10)	10(10.5)	0.08	0.927
Secondary and above	36(90)	85(89.5)		
<b>Religion</b>				
Hindu	31(77.5)	84 (88.4)	2.66	0.103
Other than Hindu	9(22.5)	11 (11.6)		
<b>Ethnicity</b>				
Brahmin/Chhetri	11 (27.5)	29 (30.5)	0.12	0.725
Others	29 (72.5)	66 (69.5)		
<b>Residential area</b>				
Urban	18 (45)	45 (47.4)	0.06	0.801
Rural	22 (55)	50 (52.6)		
<b>Income</b>				
Below 40,000	27 (67.5)	62 (65.3)	0.06	0.802
Above 40,000	13 (32.5)	33 (34.7)		
<b>Number of children</b>				
First children	23 (57.5)	39 (41.1)	3.06	0.8
Two or more	17 (42.5)	56 (58.9)		
<b>Gravidity</b>				
Primigravida	20 (50)	38 (40)	1.15	0.284
Multigravida	20 (50)	57 (60)		

Table 11. Correlation between level of knowledge and acceptability regarding human milk banking. (n=135)		
Variables	Correlation	p-value
Knowledge and acceptability	0.846	<0.001

30-34 years. Regarding education level, majority (55.6%) had secondary level it was supported by the findings of Pareshkumar and Mahadalkar(2020),<sup>6</sup> majority(28%) of respondents has received secondary level of education. Additionally, the study shows majority (80%) of respondents were involved in homemaker which was supported the study conducted by Kaur, Jain and N(2022),<sup>2</sup> most of the (88.3%) respondents involved in homemaker. Furthermore, the study shows majority (43.7%) of respondents was multipara which is similar to the study conducted by Sheela and Shasikala (2020),<sup>10</sup> in which majority (57%) were multipara respondents. In the study shows that only few (7.4%) had adequate knowledge, near to half (49.6%) had average knowledge and 43% respondents had poor knowledge regarding human milk banking. It was supported by the study conducted by Kaur, et al(2022) Which reported that 48% had average knowledge, 40% had

poor knowledge and only 12% had good knowledge regarding human milk banking.<sup>2</sup> In the study, least of the respondents had adequate knowledge though more acceptability (70.4%) regarding human milk banking. These findings also supported on the study conducted by Sethia and Melwani (2018) that least respondents (10%) have adequate knowledge and (85.4%) have highly acceptability regarding human milk banking.<sup>8</sup> Additionally, the study also shows that there was statistically significant with only one socio-demographic variable which is ethnicity ( $\chi^2=9.266$ ,  $p$  value=0.010) and it indicated that level of knowledge is statistically not significant with the others socio-demographic variables. The study finding was almost similar with the study conducted by Hussainbi and Gavishiddhayya(2021), which revealed that there is no statistically significant with socio-demographic variables.<sup>11</sup> The study reported higher percent of acceptability which was 70.4% regarding human milk banking whereas this finding was supported by the study conducted by Sethia and Melwani (2018), Where Most of the women were willing to donate (84.9) and accept (85.4) donor's breast milk.<sup>8</sup> In this study, maximum (71.9%) respondents were willing to donate human milk, the most common reason to donate was helping other infants (91.9%),it was comparable with the study conducted by Chagwena et al(2020), majority (77.6%) were willing to donate breast milk, the most common reason to donate was if they have excess breast milk (66%).<sup>12</sup> Furthermore, out of 135 respondents 28.1% were unwilling to donate human milk the most common reason was lack of breast milk (63.2%), 34.2% were unknown about human milk banking and 2.6% were have not enough time, this finding was contrary with the study of Sethia and Melwani (2018) in which only 15.1 % were unwilling to donate breast milk and most of them (54.7%) have not provided a reason. <sup>8</sup> Similarly, maximum ( 87.4%) respondents were willing to receive donor milk for baby if needed and all of the (100%) respondents said that donor human milk is formula nutritionally superior to formula milk. Least (12.6%) of respondents were unwilling to accept donor human milk where majority (64.7%) of respondents were said concerns

about contamination of donor milk in the process of expressing, more than half (58.8%) of respondents were concerns about inadequate health screening of donor and only few (5.2%) respondents said formula milk is healthy compare to donate milk, which was distinct to findings of Chagwena et al (2020) in which 31.5% were not willing to use donated breast milk, the most common reason to decline was fear for disease transmission 61.2% , a perception that donated milk is unhygienic (36.4%) and it was not accepted culturall (3.1%).<sup>12</sup> In the study reported higher percent (83%) respondents were feed their baby with someone else if they don't have enough breast milk which finding was differ to the study of Varer Akpinar et al (2022) where least (34.3%)of respondents reported that other people could breastfeed their babies if they did not have enough milk.<sup>13</sup> Additionally, most of (60%) respondents think that safety and quality standards is the main factor that affect the acceptability. But in the study conducted by Kimani-Murage et al., (2019) found that more than half (51.1%) respondents said main factor is risk of disease transmission.<sup>9</sup> Majority (94.8%) of respondents were said human milk banking need to establish in our health care institute and maximum (83%) respondents said because it provides a valuable resource for babies who cannot receive their mother's milk. In the study 29.6% respondents received breast milk for their baby from other mother and 28.9% were feed breast milk for other baby. It is comparable to previous study conducted by Varer Akpinar et al(2022) reported the finding of more than half (53.1%) respondents want a human milk bank, similarly, 7.7% respondents were received breast milk for their baby from other mothers and 12.5% were breastfed other people's babies.<sup>13</sup>

The study shows that level of knowledge is strongly correlation (0.846) with the acceptability regarding human milk banking and statistically it was significant as P value was <0.001. This study is contrary with the study conducted Pareshkumar and Mahadalkar(2020), which was negative correlation (-0.118) with knowledge and attitude scores regarding human milk donation.<sup>6</sup>

## CONCLUSIONS

The study concluded that least of respondents had good knowledge and majority had acceptability on Human milk banking though having inadequate knowledge. Majority expressed that human milk banking need to establish in the health care institute because it provides a valuable resource for babies who cannot receive their mother's milk. It suggests that it is necessary to provide detailed information on human milk banking through various channels

to improve their knowledge on human milk banking and expansion of human milk bank center by the government.

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**Conflict of Interest:** None

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