

Awareness and Perception Regarding Human Milk Donation and Milk Banking among Antenatal Mothers in a Tertiary Hospital of Kathmandu - A Cross - sectional Study

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Abstract

Introduction: Breast milk is universally recognized as the most beneficial source of nutrition for all newborns. World Health Organization (WHO) recommends the use of donor human milk to sick and normal newborns if mother's milk is unavailable to them. The objective of this study was to assess the awareness and perception regarding human milk donation and human milk banking among antenatal mothers.

Methods: A descriptive cross-sectional study was carried out among 165 antenatal mothers. Data were collected via face-to-face interviews after obtaining informed written consent. Descriptive and inferential statistics were used to analyze the findings.

Results: From the study findings, 43.6% antenatal mothers had average awareness level whereas 38.8% had adequate, and 17.6% had an inadequate awareness level. Similarly, 66.7% antenatal mothers had positive perception and 33.3% had negative perception regarding this. The level of awareness and perception was significantly associated with age ($P = 0.001$), educational status ($P = 0.002$), residence ($P = 0.013$) and religion ($P = 0.004$).

Conclusions: Antenatal mothers tend to have average awareness and positive perception regarding human milk donation and milk banking. As there is positive perceptions of human milk donation and milk banking among them, this practice should be promoted to improve the nutritional benefit for infant and non-nutritional benefit for mother.

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INTRODUCTION

Despite worldwide progress in reducing newborn deaths, there are notable regional and national variations in neonatal mortality. According to the Nepal Demographic and Health Survey (NDHS) 2022, the neonatal mortality rate (NMR) is 21 and the infant mortality rate (IMR) is 28 per 1000 live births.^{1,2} WHO and UNICEF recommend to initiate breastfeeding within one hour of birth and provide exclusively until six months of age, which lay the foundations for their optimal growth and development and reduction of mortality rates.^{3,4} However, due to maternal illness or delayed or inadequate lactogenesis, not all mothers are able to give their own milk to their

babies.⁵ WHO recommends obtaining donor milk from another mother and feeding newborns is an alternative to breast-feeding which helps to protect them from various infections and allergies and promote their health and well-being.⁴ Breast-feeding is also beneficial for promoting mother's health.⁶

Paropakar Maternity and Women's Hospital (PMWH) established the first Human Milk Bank (HMB) in 2022 as "Amrit Kosh" to ensure the access to breast milk to every infant.¹ The HMB is responsible for assessing potential donor mothers, collecting, storing and processing donated milk, conducting post-pasteurization tests, storing, and

distributing the processed milk to infants who are not biologically related to the donors.⁷ By donating breast milk to the HMB, they can save the lives of many low birth weight and preterm babies, critically ill newborns and, babies without mothers.

Various research studies have been conducted in different parts of the world but limited research studies have been conducted regarding human milk donation and milk banking in Nepal. Therefore, the researcher designed the present study on this subject. The objective of the study was to find out the awareness and perceptions of human milk donation and human milk banking among antenatal mothers.

METHODS

A descriptive cross-sectional study design was used to assess the awareness and perceptions regarding human milk donation and human milk banking among purposively selected 165 antenatal mothers attending the ANC OPD of Paropakar Maternity and Women's Hospital (PMWH), Thapathali, Kathmandu, Nepal. The required sample size was calculated by using Cochran's formula for an infinite population, at 95% confidence interval and 5% margin of error. Ethical approval for the study was taken from the Institutional Review Committee of Nepalese Army Institute of Health Sciences (Reg. No. 931) and PMWH (Ref. No. 64/723). Prior to data collection, informed written consent was obtained from each respondent after explaining the objectives of the study. Data were collected by taking face to face interview with them in a separate corner at OPD to maintain their privacy. It took about 30 minutes to complete the interview. Data were collected from December 2023 to January 2024. Inclusion criteria set were the primigravida and multigravida mothers in the third trimester of pregnancy who were willing to participate in the study. Those pregnant women who had serology tests positive, taking antiretroviral medicines, suffered from chronic diseases, had assisted fertility, and who had pregnancy-related complications were excluded from this study. Data were analyzed by using the Statistical Package for Social Science (SPSS) software version 16 for windows. Descriptive statistical methods i.e., frequency, percentage, mean, and standard deviation was used to analyze the

findings. The level of awareness was calculated on the basis of a total score, then categorized into adequate, average, and inadequate. For calculating the level of perception, a normality test of the data on perception was done. Data was not normally distributed (identified using Shapiro-Wilk test), so the level of perception was categorized from their score i.e., $\geq 50\%$ as positive and $< 50\%$ as negative perception. An inferential statistical method such as the Chi-square test was used to find out the association of the level of awareness and the level of perception regarding human milk donation and milk banking with selected variables.

RESULTS

Among 165 antenatal mothers, more than half (57.6%) were belonged to 25 - 34 years age group, with mean age of 28.24 ± 6.15 years. Majority (69.1%) of the respondents followed Hinduism, and 49.7% were from Janajati ethnicity. Similarly, more than half (67.9%) of respondents were housemakers, 92.7% of them could read and write and 53.3% were from urban areas. Almost all (99.4%) of the respondents were aware on importance of maintaining personal cleanliness while giving breast milk and 98.2% of them were aware on donating human milk can be helpful for newborns' growth and development as well as to save their lives. Similarly, 92.1% of the respondents said that breast milk from donors boosts immunity and helps prevent malnourishment in babies. Around 25% were aware that donor mothers could donate their breast milk after delivery at a health care center. Most (87.9%) of the respondents were unaware on keeping pasteurized human milk in a freezer for six months (Table 1). Overall, 43.6% of respondents had average level of awareness, 38.8% had adequate level of awareness, and 17.6% had inadequate level of awareness on human milk donation and milk banking (Table 2).

In this study, the level of awareness of respondents regarding human milk donation and milk banking was significantly associated with age ($P = 0.001$), educational status ($P = 0.002$), residence ($P = 0.013$) and religion ($P = 0.004$), whereas, ethnicity and occupation were not associated with their level of awareness ($P > 0.05$) (Table 3).

Table 1: Respondents' awareness on human milk donation and milk banking (N = 165)

Statements	True No. (%)	False No. (%)
Breast milk donation is voluntary act without any monetary benefits to the donors	135 (81.8)	30 (18.2)
Donated breast milk is recommended by Government of Nepal for newborn babies	103 (62.4)	62 (37.2)
Lactating mothers can donate their excess breast milk to human milk banks without compromising their babies	110 (67.7)	55 (33.3)
Donated breast milk is nutritionally superior to formula milk	146 (88.5)	19 (11.5)
Donor mothers can donate their breast milk after delivery at health care center	42 (25.5)	123 (74.5)
Nepal Government has laws and policies to ensure the quality of donated human milk	63 (38.2)	102 (61.8)
Human milk donation can save the lives of newborn babies	162 (98.2)	3 (1.8)
Donated breast milk can boost immunity of newborns which prevents infections to them	152 (92.1)	13 (7.9)
Donated breast milk helps for growth and development of newborn babies	162 (98.2)	3 (1.8)
Donated breast milk helps to prevent malnutrition to the newborns	152 (92.1)	13 (7.9)
Human milk bank provides processed human milk to needy hospitalized newborn babies	91 (52.2)	74 (44.8)
Human milk donors should maintain their personal hygiene while donating breast milk	164 (99.4)	1 (0.6)
Eligible human breast milk donors are selected and screened by personnel from human milk bank	105 (63.6)	60 (36.4)
Donors' human milk is collected by trained personnel from human milk bank	81 (49.1)	84 (50.9)
After collection, pasteurized human milk is stored in a freeze for six months in Nepal	20 (12.1)	145 (87.9)

Table 2: Respondents' level of awareness on human milk donation and milk banking

Level of awareness	Number	Percent
Inadequate (< 50% marks)	29	17.6
Average (50% - 75% marks)	72	43.6
Adequate (> 75% marks)	64	38.8
Total	165	100

Table 3: Association of the level of awareness with socio-demographic variables of respondents

Variables	Awareness level			Value	
	Inadequate (N = 29) No. (%)	Average (N = 72) No. (%)	Adequate (N = 64) No. (%)	χ^2 value	P - value
Age (in years)					
< 25	5 (10.4)	24 (50.0)	19 (39.6)	20.739	0.001*
25 - 34	14 (14.7)	37 (38.9)	44 (46.3)		
≥ 35	10 (45.5)	11 (50.0)	1 (4.5)		
Educational status					
Can't read and write	6 (50.0)	5 (41.7)	1 (8.3)	7.749	0.002*
Can read and write	23 (15.0)	67 (43.8)	63 (41.2)		
Religion					
Hinduism	12 (10.5)	56 (49.1)	46 (40.4)	15.281	0.004*
Buddhism	8 (29.6)	7 (25.9)	12 (44.4)		
Others	9 (37.5)	9 (37.5)	6 (25.0)		
Ethnicity					
Brahmin / Chhetri	9 (15.5)	30 (50.8)	20 (33.9)	1.942	0.379
Others	20 (18.9)	42 (39.6)	44 (41.5)		
Occupation					
House maker and Agriculture	24 (17.8)	57 (42.2)	54 (40.0)	0.639	0.727
Others	5 (16.7)	15 (50.0)	10 (33.3)		
Residence					
Urban	9 (10.2)	38 (43.2)	41 (46.6)	8.763	0.013*
Rural	20 (26.0)	34 (44.2)	23 (29.9)		

*Significant at P value < 0.05

In this study, almost all (91.5%) respondents disagreed with the statement that they would only donate their breast milk to the newborns of their relatives and friends. Antenatal mothers' perception on various statements regarding human milk donation and milk banking is shown in Table 4.

The majority (66.7%) of the antenatal mothers had a positive perception and 33.3% had a negative perception regarding human milk donation and milk banking (Table 5).

Table 4: Respondents’ perception on human milk donation and milk banking

Statements	Disagree No. (%)	Neutral No. (%)	Agree No. (%)
Excess breast milk donation does not harm mothers and their newborn babies	13 (7.9)	31 (18.8)	121 (73.3)
Like to donate excess breast milk	12 (7.3)	47 (28.5)	106 (64.2)
Human milk donation can be influenced by culture, caste and religion	130 (78.8)	10 (6.1)	25 (15.2)
Only donate breastmilk to the newborns of own relatives and friends	151 (91.5)	8 (4.8)	6 (3.6)
Certain amount of money should be given to donor mothers	152 (92.1)	8 (4.8)	5 (3.0)
Milk donation is difficult process and need assistance	134 (81.2)	18 (10.9)	13 (7.9)
There is a risk of transmission of infectious diseases through donated breast milk	96 (58.2)	16 (9.7)	53 (32.1)
Breast milk donation is selflessness and humanism	13 (7.9)	20 (12.1)	132 (80.0)
Willing to donate breast milk if human milk bank is easily accessible	13 (7.9)	53 (32.2)	99 (60.0)
In future if not having enough breast milk after delivery, will reach out to the milk bank for support	13 (7.9)	39 (23.6)	113 (68.5)

Table 5: Level of perception on human milk donation and milk banking

Level of perception	Number	Percent
Positive perception	110	66.7
Negative perception	55	33.3
Total	165	100

The level of perception of respondents on human milk donation and milk banking was significantly associated with age ($P = 0.001$), educational status ($P = 0.011$) and religion ($P = 0.005$) of antenatal mothers, whereas

residence and ethnicity were not associated with their level of perception on human milk donation and milk banking ($P = 0.05$) (Table 6).

Table 6: Association of the level of perception with socio-demographic variables

Variables	Level of perception		Value	
	Negative (N =55) No. (%)	Positive (N =110) No. (%)	χ^2 value	P value
Age (in years)				
< 25	13 (27.1)	35 (72.9)	17.728	0.000*
25 - 34	26 (27.4)	69 (72.6)		
≥ 35	16 (72.7.)	6 (27.3)		
Education status				
Can read and write	47 (30.71)	106 (69.28)	6.47	0.011*
Can't read and write	8 (66.66)	4 (33.33)		
Religion				
Hinduism	29 (25.4)	85 (74.6)	10.552	0.005*
Buddhism	13 (48.1)	14 (51.9)		
Others	13 (54.2)	11 (45.8)		
Ethnicity				
Dalit	8 (57.1)	6 (42.9)	5.663	0.129
Janajati	25 (30.5)	57 (69.5)		
Brahmin / Chhetri	17 (28.8)	42 (71.2)		
Others	5 (50.0)	5 (50.0)		
Residence				
Urban Area	26 (29.5%)	62 (70.5%)	1.218	0.270
Rural Area	29 (37.7%)	48 (62.3%)		

*Significant at P value < 0.05

DISCUSSION

In the present study, almost all (98.2%) antenatal mothers told that donated human milk could help newborn's growth and development and save their lives. Ninety-two percent of mothers said that donated breast milk boosts immunity and avoids malnourishment in babies, and 88.5% of antenatal mothers said that donated breast milk is nutritionally superior to formula milk which all are correct responses. These findings are in concordance with a similar study conducted in USA among 73 postnatal mothers, where 73% of mothers said that donated human milk is a primary source of nutrition for all infants and helps in a new born's growth and development.⁸ However, another study conducted in Hyderabad, India, is in contrast to our findings where 57.3% mothers said that donor breast

milk provides certain immunity, while 46% said that donor milk had higher nutritional contents compared to formula feed.⁹

In the present study, 38.8% antenatal mothers had adequate awareness, 43.6% had average level of awareness and, 17.6% had inadequate awareness regarding human milk donation and milk banking. This is in agreement with another study conducted in Nigeria among 317 breast-feeding mothers.¹⁰ Another study conducted among 100 antenatal mothers in Maharashtra, India found that 55.5% mothers had good awareness and 37% had average awareness.¹¹ The disparity in the finding may be due to difference in study setting and sample size in different geographic regions.

As per the present study findings, 80% of the antenatal mothers agreed that donation of breast milk as a selfless and humanistic process. This finding is consistent with findings from a study conducted in the USA.⁸ Similarly, almost all antenatal mothers from the current study agreed that they would donate their breast milk only to the newborns of their relatives and friends, which is comparable to the study findings from Turkey where 90.7% of mothers disagreed on giving their breast milk to the strangers.¹² In the current study, 64.2% of antenatal mothers were willing to donate their excess breast milk to the human milk bank, and 68.5% agreed that they would reach out to the milk bank if they did not have enough breast milk after delivery. But in a study conducted among 324 refugee women in Turkey, only 57.9% women were willing to donate breast milk, and 27.7% were willing to use donor milk for their babies.¹³ Consistent findings were reported in another study conducted in Izmir among 404 postnatal mothers where 68.8% of them were willing to donate their breast milk.¹⁴

In the current study, 78.8% antenatal mothers agreed that human milk donation could not be influenced by culture, caste, or religion. Similarly, about 32.1% of antenatal mothers believed that infectious diseases could be transmitted from donated breast milk. These findings were notably higher compared to the two study findings from Turkey. In one study among 231 breast-feeding women, only 23.6% of respondents agreed that human milk donation was inconvenient because of cultural norms, individual preferences, concerns about hygiene, perceptions of insufficient milk for donation, and fear of disease transmission.¹⁵ In another study among 244 postnatal mothers, only 19.8% of respondents believed that infectious diseases could be transmitted from donated breast milk.¹⁶ This disparity in findings may be due to differences in sampled population, sample size and geographical variation.

The current study identified that the majority (66.7%) of antenatal mothers had a positive perception, while 33.3% had a negative perception regarding human milk donation and milk banking. These findings were consistent with the study findings from India among 100 postnatal mothers, where 71% had a positive perception.¹⁷ Another study conducted among 868 mothers in Nairobi, Kenya, revealed 91% of mothers had positive perception regarding human milk donation and milk banking because there was provision of sufficient information and awareness programs related to human milk donation and milk banking for postnatal mothers.¹⁸

Present study indicated that the level of awareness about human milk donation and milk banking is significantly associated with age ($P = 0.001$), educational status (P

$= 0.002$), religion ($P = 0.004$), and residence ($P = 0.013$). These findings are contradictory to the findings of a study conducted in Pune, India, which reported that there was no significant association identified between the level of awareness and the age and educational status of the respondents.¹⁹

The present study revealed that there was a significant association identified between the level of perception of antenatal mothers regarding human milk donation and milk banking with the age ($P = 0.001$), educational status ($P = 0.011$), and religion ($P = 0.005$). These findings are contradictory to the findings of a study conducted among 150 breast-feeding mothers in Hyderabad, India, which showed that there was no significant association between age, educational status, and religion, which might be due to the differences in study setting and sampled population.¹¹

CONCLUSIONS

The study concludes that antenatal mothers tend to have average awareness and a positive perception regarding human milk donation and milk banking. Age, educational status, religion and residence tend to influence their level of awareness. Similarly, their age, education and religion tend to influence their level of perception regarding human milk donation and milk banking.

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