Original Research Article

Knowledge of nursing officers regarding human milk banking at a tertiary care centre of South Rajasthan

Badrilal Meghwal[1,*], Rameshwar Lal Suman[1], Manisha Balai[2], Bhupesh Jain[1]

[1]Dept. of Paediatrics, RNT Medical College, Udaipur, Rajasthan, India
[2]Dept. of Dermatology, RNT Medical College, Udaipur, Rajasthan, India

A B S T R A C T

Background: It is universally accepted that breast milk is the optimum exclusive source of nutrition for the first six months of life and may remain part of the healthy infant diet for the first two years of life and beyond. Sometimes, mothers cannot breast feed their babies due to various causes related to mother and newborn. Human breast milk can be stored and can be used for feeding these newborns and this may help in decreasing neonatal mortality rate. Therefore, nursing officers should have up to date information regarding the human milk banking along with doctors. The aim of this study was to assess the knowledge of nursing officers regarding importance of human milk banking.

Materials and Methods: This quantitative, descriptive research study was used to assess the knowledge of nursing officers regarding the human milk banking and to identify service-related factors associated with the level of knowledge. Two hundred and six participants were enrolled who fulfilled the inclusion criteria of the study. A structured questionnaire was used to assess the knowledge level among the nursing officers. Both descriptive and inferential statistical methods were used for the analysis of data.

Results: Study findings revealed that out of total 206 participants, maximum were in the age group of 31-40 years (63.6%). 57.8% nursing officers have adequate knowledge regarding importance of human milk banking. Knowledge of nursing officers was significantly associated with working department.

Conclusions: Study concluded that knowledge of nursing officers regarding importance of human milk banking is satisfactory. Conduction of regular in-service programs and periodic rotation of nursing officers in each department may also help in upgrading the knowledge about human milk banking.

1. Introduction

Because human milk is still the only milk that is specifically crafted and perfectly matched for a baby, breastfeeding is still the greatest way to feed a baby. It should be emphasised to all women that they should nurse their children.[1] One joint declaration from WHO and UNICEF reads, "Where it is not possible for the biological mother to breastfeed, the first alternative, if available, should be the use of human milk from other sources."[2] The first six months of a baby's life should be spent solely on breastfeeding.[3] As the best unique first source of nutrition, it is acknowledged on a global scale. Due to the physical and psychological benefits of nursing, mothers may not be able to produce a whole volume of milk

When a mother, for some reason, is unable to feed her infant directly, her breastmilk should be expressed and fed to the infant. If mother's own milk is unavailable or insufficient, the next best option is to use pasteurized donor human milk (PDHM). India faces its own unique challenges, having the highest number of low birth weight babies, and significant mortality and morbidity in very low birth weight

* Corresponding author.
  E-mail address: drblmeghwal@gmail.com (B. Meghwal).

(VLBW) population. In our country, the burden of low birth -weight babies in various hospitals is about 20% with significant mortality and morbidities. [4]

1.1. Demand for human donor milk

There are various factors that make a mother's own milk for her kid scarce or unavailable. Included in this are baby illnesses, difficulty latching, maternal illness or death, and abandonment. Due to physical obstacles and psychological strain, a mother may not make enough milk if a baby is preterm or admitted to a neonatal intensive care unit. The World Health Organization and other policy organisations advise donor human milk as a suitable replacement in such circumstances. By selecting and recruiting breast milk donors, collecting, processing, screening, pooling, and giving to newborns in need, a human milk bank serves a key role. [5]

In 1909, the first human milk bank opened in Vienna, Austria and the first in North America opened in 1919 in Boston, USA. [6,7] Worldwide, there are about 517 breast milk banks. However, the Sion Hospital in Mumbai, India, became home to the first breast milk bank in Asia in 1989. [8] In 2013, first public sector breast milk bank was established in Kolkata. [9]

Breast milk banks aim to provide mother's milk to all newborns and hospital patients, avoiding bottle, animal, and formula milk, raising breastfeeding awareness, supporting breastfeeding habits, and promoting Baby Friendly Hospital care. [10]

The best strategy to reduce infant mortality in India is to increase the number of breast milk banks. In order to improve outcomes and promote their health, nutrition optimisation is crucial. Because they are affordable and simple to manage, breast milk banks are highly important. Government and community involvement are crucial in motivating hospitals and non-profit organisations to work towards the development of more breast milk banks. [5]

2. Materials and Methods

This quantitative, non-experimental, descriptive study was conducted at Paediatric department of tertiary care hospital of India. Total sample size was 206 nursing officers working in paediatric, obstetric and gynae departments. Tools used for the study consists of two parts.

2.1. Part A: Socio-demographic data

This part of consists of demographic information of the study participants such as age, gender, professional qualification, working area, working department and working experience.

2.2. Part B: Structured questionnaire to assess the knowledge of nursing officers regarding importance of human milk banking working in obstetric, gynae and pediatric wards

This part of tool consists of 25 structured multiple-choice questions having one correct answer among four options to assess the knowledge of nursing officers regarding human milk banking. Each item had a score of one (1) mark for correct answer and zero (0) for incorrect answer with overall score range from (0-25). Reliability of the tool was established by split-half method which is 0.83 (highly reliable).

2.3. Inclusion criteria

1. Nursing officers working in pediatric, obstetric and gynae wards.

2.4. Exclusion criteria

1. Nursing officers who are not willing to give consent.

2.5. Ethical considerations

Ethical approval was taken from Institutional Ethical Committee. A written informed consent was taken from each participant.

2.6. Statistical methods

The data was analyzed by using the descriptive statistics by calculating mean, median and standard deviation and inferential statistics by applying chi-square to assess the association of level of knowledge with selected demographic variables under study and karl pearson correlation is used to calculate the reliability of the tool.

3. Results

3.1. Part A: Socio-demographic characteristics of study participants

The frequency and percentage distribution of study participants as per their socio demographic characteristics is shown in Table 1.

More than half of the nursing officers (63.6%) were from the age group of 31-40 years and least number (5.8%) were from the age group 51-60 years. Majority of nursing officers (79.1%) were females whereas (20.9%) were males with M:F ratio of 0.26:1. Majority of nursing officers (93.2%) had professional qualification GNM course followed by (6.3%) BSc. Nursing. Only one (0.5%) had professional qualification of MSc. Nursing.

As per their working department (40.8%) nursing officers were working in neonatal ICU /paediatric ICU. Almost equal number of nursing officers were working in paediatric

(30.1%) and gynae (29.1%) ward. Almost half of the nursing officers (52.4%) had working experience of 5-10 years followed by less than 5 years (25.2%) of experience. 14.1% and 5.8% of nursing officers had working experience of 10 -15 years and more than 20 years respectively. Hence, concluded that majority of nursing officers were females of age group of 31-40 years having professional qualification GNM Course. Maximum of nursing officers were working in neonatal ICU/Paediatric ICU having working experience of 5-10 years.

3.2. Part B: To assess the knowledge of nursing officers regarding importance of human milk banking.

Table 2 shows the frequency and percentage distribution of level of knowledge of nursing officers. More than half of the nurses (57.8%) had adequate knowledge whereas, (42.2%) nursing officers had inadequate knowledge. Thus, more than half of nurses had adequate level of knowledge.

The skewness was calculated by using formula [3(mean - median)/SD] and found to be -0.45 suggesting the distribution is slightly –ve skewed. This implies that number of nurses having adequate knowledge is more towards the right side of the curve than to left, signifying more number of nursing officers have adequate knowledge that is (57.8%). Thus, it can be concluded that the more than half of the nursing officers have adequate knowledge regarding human milk banking.

Table 3 shows that 19 (9.2%) nursing officers in the group 20-30 years had adequate knowledge regarding importance of human milk banking while 19 (9.2%) had inadequate level of knowledge. On the other hand, only 7 (3.4%) nursing officers in age group 51-60 years age group had adequate knowledge. 78 (37.9%) and 15 (7.3%) nursing officers in age group 31-40 years and 41-50 years had adequate knowledge respectively while 53 (25.7%) and 10 (4.9%) nursing officers in age group 31-40 years and 41-50 years had inadequate knowledge respectively. To explore the association of level of knowledge with age, Chi-square 2, test was computed, the value of which was found to be 1.16 with p-value 0.762 which was statistically not significant. Hence, it was concluded that level of knowledge has no association with age.

Table 4 shows that 28 (13.6%) male nursing officers had adequate level of knowledge while 15 (7.3%) had inadequate level of knowledge. On the other hand, 91 (44.2%) female nursing officers had adequate level of knowledge while 72 (34.9%) had inadequate level of knowledge. To explore the association of level of knowledge with gender, Chi-square 2, test was computed, the value of which was found to be 1.2031 with p-value 0.27 which was non-significant at p-value. Hence, it is concluded that level of knowledge has no association with gender.

Table 5 reveals that 111 (53.9%) nursing officers with professional qualification GNM course had adequate

knowledge regarding importance of human milk banking while 81 (39.3%) of them had inadequate level of knowledge. 8 (3.9%) nursing officers with professional qualification BSc. Nursing had adequate knowledge while 5(2.4%) had inadequate knowledge. There was only one nursing officer with professional qualification MSc. Nursing and he had inadequate knowledge. To explore the association of level of knowledge with professional qualification, Chi-square 2, test was computed, the value of which was found to be 1.443 with p-value 0.48 which was statistically not significant. Hence, it is concluded that level of knowledge has no association with professional qualification.

Table 6 depicts that 55 (26.7%) nursing officers working in neonatal ICU/paediatric ICU had adequate knowledge while 29 (14.1%) had inadequate knowledge. Nursing officers working in paediatric ward had similar level of knowledge regarding importance of human milk banking. On the other hand, 33 (16%) of nursing officers working in gynae ward had adequate knowledge while 27 (13.1%) had inadequate knowledge. To explore the association of level of knowledge with working department, Chi-square 2, test was computed, the value of which was found to be 3.767 with p-value 0.015 which was significant at p-value < .05. Hence, data shows that nursing officers working in paediatric department had more knowledge regarding human milk banking as compare to nurses working in Gynae department.

Table 7 reveals that 27 (13.1%) nursing officers having working experience less than 5 years had adequate knowledge regarding importance of human milk banking while 25 (12.1%) had inadequate level of knowledge. 62 (30.1%) nursing officers having working experience 5-10 years had adequate knowledge while as 46 (22.3%) had inadequate knowledge. On the other hand, 4 (1.9%) and 7 (3.4%) nursing officers having working experience 15-20 years and more than 20 years respectively had adequate knowledge. To explore the association of level of knowledge with working experience, Chi-square 2, test was computed, the value of which was found to be 3.229 with p-value 0.520 which was non-significant at p-value. Hence, it is concluded that level of knowledge had no association with working experience.

4. Discussion

The findings of the present study reveal that 57.8% of nursing officers had adequate knowledge while 42.2% had inadequate knowledge regarding human milk banking. Study by Kumari P et al[11] showed that 66% had adequate knowledge. Findings in study by Renuka[12] revealed that 15% staff nurses had poor knowledge, 66.66% had average knowledge and 18.37% had good knowledge. Bhat Asha Vinod did a study among B.Sc. Nursing students and found that only 3% had poor knowlegde, 33% had good

Table 1: Frequency and percentage distribution of the nursing officers according to their demographic variables (n=206)

Demographic variables		Number	Percentage (%)
Age	20-30 years	38	18.4
	31-40 years	131	63.6
	41-50 years	25	12.1
	51-60 years	12	5.8
Gender	Male	43	20.9
	Female	163	79.1
Professional qualification	GNM course	192	93.2
	BSc. nursing	13	6.3
	MSc. nursing	1	0.5
Working department	Neonatal ICU/ Paediatric ICU	84	40.8
	Paediatric ward	62	30.1
	Gynae ward	60	29.1
Working experience	Less than 5 years	52	25.2
	5-10 years	108	52.4
	10-15 years	29	14.1
	15-20 years	5	2.4
	More than 20 years	12	5.8

Table 2: Frequency and percentage distribution of level of knowledge of nursing officers

Level of knowledge	Criteria/Range	Number (%)
Adequate knowledge	≥ 20.68	119 (57.8)
Inadequate knowledge	Below mean < 20.68	87 (42.2)

Table 3: Association of level of knowledge with age

Age group	Adequate knowledge N (%)	Inadequate knowledge N (%)	Total	Chi-square value	P- Value
20-30 years	19 (9.2)	19 (9.2)	38		
31-40 years	78 (37.9)	53 (25.7)	131		
41-50 years	15 (7.3)	10 (4.9)	25	1.16	0.762
51-60 years	7 (3.4)	5 (2.4)	12		
Total	119	87	206		

The chi-square statistic is 1.1615. The p-value is .762257. The result is not significant at p < .05.

Table 4: Association of level of knowledge according to gender

Gender	Adequate knowledge N (%)	Inadequate knowledge N (%)	Total	Chi-square value	P- Value
Male	28 (13.6)	15 (7.3)	43		
Female	91 (44.2)	72 (34.9)	163	1.2031	0.27
Total	119	87	206		

The chi-square statistic is 1.2031. The p-value is .2727. The result is not significant at p < .05

Table 5: Association of level of knowledge with professional qualification

Professional qualification	Adequate knowledge N (%)	Inadequate knowledge N (%)	Total	Chi-square value	P- Value
GNM course	111 (53.9)	81(39.3)	192		
BSc. nursing	8 (3.9)	5 (2.4)	13	1.443	0.48
MSc. nursing	0 (0)	1 (0.5)	1		
Total	119	87	206		

The chi-square statistic is 1.443. The p-value is 0.48. The result is not significant at p < .05

Table 6: Association of level of knowledge with working department

Working department	Adequate knowledge N (%)	Inadequate knowledge N (%)	Total	Chi-square value	P- Value
Neonatal ICU/ Paediatric ICU	55 (26.7)	29 (14.1)	84		
Paediatric ward	31 (15.0)	31 (15.0)	62	3.767	0.015
Gynae ward	33 (16.0)	27 (13.1)	60		
Total	119	87	206		

The chi-square statistic is 3.767. The p-value is 0.015. The result is significant at $p < .05$

Table 7: Association of level of knowledge with working experience

Working experience	Adequate knowledge N (%)	Inadequate knowledge N (%)	Total	Chi-square value	P- Value
Less than 5 years	27 (13.1)	25 (12.1)	52		
5-10 years	62 (30.1)	46 (22.3)	108		
10-15 years	20 (9.7)	9 (4.4)	29	3.229	0.520
15-20 years	4 (1.9)	1 (0.5)	05		
More than 20 years	7 (3.4)	5 (2.4)	12		

The chi-square statistic is 3.229. The p-value is 0.520. The result is not significant at $p < .05$

knowledge and rest had average knowledge.[13] On contrast to these studies, Safeena Beevi et al[14] reported that only 6.82% of nursing officers had adequate knowledge about human milk banking.

In our study 37.9% nursing officers in the age group 31-40 years had adequate knowledge human milk banking. This observation was similar to other study.[11] Pankaj Ray et al[15] showed slightly higher (80%) incidence in this age group. Nursing officers with professional qualification GNM course had adequate knowledge regarding importance of human milk banking which is similar in other studies also.

Data from our study showed that nursing officers working in paediatric department had more knowledge regarding human milk banking as compare to nurses working in Gynae department. This was observed in other studies also. Nursing officers having working experience 5-10 years had more adequate knowledge than more than 10 years of experience this was in contrast to study by Poonam Kumari et al.

5. Conclusion

Study concluded that knowledge of nursing officers regarding importance of human milk banking is satisfactory. Conduction of regular in-service programs and periodic rotation of nursing officers in each department may also help in upgrading the knowledge about human milk banking.

6. Conflict of Interest

None.

7. Source of Funding

None.

References

1. Das BK, Mishra RN, Mishra OP, Bhargava V, Prakash A. Comparative outcome of low birth weight babies. *Indian Pediatr*. 1993;30(1):15–21.
2. Baby Chakra App. Milk Banks: Mining the Precious 'Liquid Gold' For Moms and Babies; 2017. Available from: https://www.babychakra.com/learn/1328-milkbanks-mining-the-precious-liquid-gold-for-momsand-babies.Accessed04.
3. Donna M. The Composition of Breast Milk. Explore the Nutritional Benefits and Components of Breast Milk. Very Well Family; 2016. [Accessed 05 Dec 2016]. Available from: https://www.verywellfamily.com/whats-in-breastmilk-4047820.
4. Bharati P, Pal M, Bandyopadhyay M, Bhakta A, Chakraborty S, Bharati P. Prevalence and causes of low birth weight in India. *Malayasian J Nutr*. 2011;17:301–314.
5. Yadav S, Rawal G. Human breast milk bank. *Int J Health Sci Res*. 2015;5(6):592–7.
6. Jones F. History of North American donor milk banking: One hundred years of progress. *J Hum Lact*. 2003;19(3):313–8. doi:10.1177/0890334403255857.
7. Human Milk Banking Association of North America. [cited 2015 April 16]. Available from: https://www.hmbana.org/.
8. Khadse S, Hiremath A. Human milk bank: where every precious drop counts. *Med J Western India*. 2013;41:45–52.
9. Kumar A. Policy made for human milk banks. [cited 2015 April 16]. Available from: http://www.thehindu.com/news/cities/Delhi/policy-made-for-human-milkbanks/article6206080.
10. Fernandez A. Indian Experience of Setting a Human Milk Bank. [cited 2015 April 16]. Available from: http://worldbreastfeedingconference.org/images/128/DR_%20ARMIDA%20FERNANDZ.pdf.
11. Kumari P, Vandna. Nurse's knowledge regarding importance of human milk and milk banking. *Int J Res Med Sci*. 2019;7(12):4715.
12. Nangia S, Sachdeva RC, Sabharwal V. Human milk banking: An Indian experience. *Neo Rev*. 2018;19(4):201–11.

13. Siddiqui SA. Human Milk Banking in India: Still in Infancy. *Indian Pediatr*. 2017;54(11):975–6.
14. Beevi SS, Shanu A, Akila, Geethan A, Suryan A, Kuma A, et al. Assessment of Knowledge regarding Human Breast Milk Bank among the Nursing Officers. *Medicon Med Sci*. 2021;1(2):13–20.
15. Ray P, Thakali S. Knowledge of Nurses about Human Milk and Milk Banking. *Acta Scientific Med Sci*. 2021;5(10):25–30.

Author biography

Badrilal Meghwal, Associate Professor

Rameshwar Lal Suman, Senior Professor

Manisha Balai, Assistant Professor

Bhupesh Jain, Associate Professor