

Determinants of Breast Milk Donation and Use among Postpartum Women at a City Hospital in Nairobi, Kenya

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ABSTRACT

Background: The World Health Organization advocates donor human milk as a superior substitute for newborns unable to obtain their mother's milk. Calls have been made to scale up human milk banks to provide infants without access to mother's milk safe donor human milk. This research sought to assess determinants of breast milk donation and the use of donor human milk among postpartum women.

Subjects and Method: This cross-sectional study was conducted in May 2023 at a government hospital with human milk banking facilities. A consecutive sampling technique was used to recruit a sample of 370 postpartum women admitted to the postnatal wards. A pre-tested interview-based questionnaire was used to obtain participants' socio-demographic data, breastfeeding history, perinatal characteristics, awareness of human milk banking, and other general factors that might influence acceptance to donate breast milk and the use of donated human milk. Data was analyzed using R-4.3.0 software and descriptive statistics were done for all variables. Further inferential statistics including the Chi-Square test and multivariate logistics regression were computed with a significance level set at $\alpha=0.050$.

Results: The mother's willingness to donate breast milk and use donor human milk was 78.1% and 70.8% respectively. The respondent's age (OR=0.42; 95% CI=0.19 to 0.94; $p=0.035$) was significantly associated with willingness to donate breast milk. Religion (OR=0.27; 95% CI=0.10 to 0.72; $p=0.009$) and awareness of human milk banking (OR=0.89; 95%CI= 1.07 to 3.36; $p= 0.029$) were significant predictors of willingness to use donor human milk.

Conclusion: Human milk banking awareness was low among the study population; however, mothers are willing to donate and use donated breast milk. Age in years is significantly associated with willingness to donate while religion and awareness of human milk banking are significant predictors of use.

Keywords: Human milk bank, donor human milk, breastfeeding, breast milk

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BACKGROUND

Breast milk is the optimal nutrition source for every newborn. It contains bioactive

compounds that are fundamental for their developing immune system. This single characteristic of breast milk makes it essential

for the survival of infants, especially premature and underweight newborns who are known to have weak immune systems (Sánchez et al., 2021). Other health advantages associated with the provision of breast milk to infants include the promotion of gastrointestinal health, decreased mortality rates from severe respiratory infections and constipation, enhanced neurodevelopmental outcomes, and lowered risk of infectious illnesses in early childhood (Couto et al., 2020).

Breast milk provision has been considered a foundation for child survival and a viable means of reducing the more than 2.5 million infant mortalities that occur annually across the globe (Rosa-Mangeret et al., 2022). Considering the death risk of a non-breastfed child is significantly greater compared to that of a breastfed infant, especially in developing countries, it is evident human milk has the greatest effect on child health (You et al., 2015). Therefore, to survive and flourish, newborn babies require the greatest care possible, including human milk, one of the most sophisticated forms of tailored medicines available. Following World Health Organization (WHO) recommendations, all infants need to be fed human milk exclusively at least six months after birth (WHO, 2003).

However, not all mothers can provide their babies with breast milk for a variety of reasons, including being too ill to breastfeed, using medications that are not advised during breastfeeding, delayed lactation, and separation from their babies. Furthermore, infants who are at risk—such as those who are orphaned, abandoned, underweight, preterm, or suffering from serious health conditions—might lack access to mother's milk (Victoria et al., 2016). These neonates are susceptible to poorer health outcomes as a result of complications that can be prevent-

ed with simple and economical interventions such as the provision of human milk.

In instances where Mother's Own Milk (MOM) is insufficient or inaccessible, WHO advocates Donor Human Milk (DHM) as a life-saving substitute, particularly for vulnerable, preterm, and Low Birth Weight (LBW) neonates who are considered high-risk populations with high mortality and morbidity rates (WHO, 2011). Evidence strongly suggests that DHM from Human Milk Banks (HMBs) is preferable to infant formula. Systematic analyses comparing DHM to infant formula show that DHM is substantially less likely to cause necrotizing enterocolitis in neonates, it is better tolerated by preterm newborns, and significantly reduces the risk of late-onset sepsis (Altobelli et al., 2020).

In recognition of the advantages of DHM over infant formula where the use of MOM is not a viable option, the World Health Organization has recommended the expansion of HMBs globally (Darmstadt et al., 2023). HMBs are designed to collect human milk from recruited donors after which, the donated milk is pasteurized, screened, and safely stored to ensure it's free from any form of contamination. Upon prescription, the DHM is distributed to cater to the unique nutritional and health requirements of infants in need (Demarchis et al., 2017). It has been established that the use of DHM over formula feeding in countries around the world, particularly developed countries where donor human milk is commonly utilized in caring for preterm and LBW neonates, considerably lowers Neonatal Mortality Rates (NMRs) (You et al., 2015). The global trend in establishing and maintaining HMBs to meet clinical demand for donor human milk has increased as the advantages of DHM are becoming more widely understood. Over 60 countries throughout the world have now established

human milk banks, with a modest but growing number of HMBs operating in resource-constrained regions (Shenker et al., 2020).

The slow uptake of human milk banking in some countries can be attributed to knowledge gap in the practice. According to research conducted in countries including Turkey, Nigeria, and South Africa, respondents who demonstrated awareness of human milk banking were well-informed about the procedures and hence more likely to donate or utilize DHM (Gürol et al., 2014; Abhulimhen-Iyoha et al., 2015; Goodfellow et al., 2016). Lack of knowledge led to inaccurate information on HMBs which affected the donor pool in that only a few mothers wanted to donate according to studies carried out in Italy and the USA (Virano et al., 2017; Pal et al., 2019). The fear of spreading diseases is considerably high in most developing countries considering they bear the heaviest burden of HIV/AIDS, a factor that drastically constricts the pool of potential donors. Other obstacles include a lack of policy support from the government, unfavorable community and maternal attitudes toward human milk banking, and detrimental traditions that frequently hinder the success of HMBs (McCloskey and Karandikar, 2018).

The Sustainable Development Goals (SDGs) aim to eliminate all preventable infant mortalities by 2030 and lower NMR to at least twelve deaths per one thousand live births. In this regard, additional resources and efforts are required during this crucial neonatal stage. Out of all the known strategies, breast milk has the biggest possible effect on child survival (Wu and Clark, 2016). The improvement of lactation practices and, thus, the availability of MOM depend on the support, promotion, and protection of breastfeeding (Demarchis et al., 2017). Increased lactation assistance and

better lactation counseling would help build a strong breastfeeding culture which would boost the pool of potential donors (Gelano et al., 2018).

Kenya launched a hospital-based model HMB, the first one in Eastern Africa in 2019 at the Pumwani Maternity Hospital. The human milk bank enhances the safe delivery of DHM to newborns unable to obtain mother's milk as well as improving breastfeeding support for lactating mothers. Limited literature is currently available citing awareness and acceptance of human milk banking in the country. This study seeks to address this significant literature gap by determining the awareness and acceptance level of the practice. Furthermore, it will evaluate determinants of breast milk donation and the use of donated human milk among postpartum women.

SUBJECTS AND METHOD

1. Study Design

A cross-sectional study design was used. The study was carried out in May 2023 at the largest hospital in Nairobi County, Kenya. The hospital has an average of one hundred and twenty deliveries per day. The facility is dedicated to maternity and newborn care and mostly serves women from Nairobi and the surrounding counties who are low and middle-income earners.

2. Population and Sample

The study population was postpartum women. Mothers above eighteen years admitted at the postnatal wards including those referred from different hospitals during the research period were considered to be part of the study. Mothers with babies in critical condition, mothers who declined to be part of the study, as well as mothers who were ill and could not answer survey questions were excluded from this research.

The parameters from a feasibility study in Kenya that found 78% of the

sampled population showed willingness to donate human milk was used to determine the sample size for this study (Kimani-Murage et al., 2019). A single population proportion formula was used to estimate the sample size with a 95% confidence level and 5% margin of error. A consecutive sampling technique was used to recruit three hundred and seventy mothers exceeding the necessary minimum sample needed.

3. Study Variables

Data on the dependent variables (willingness to donate breast milk and willingness to use DHM) was collected. Respondents were classified as willing or not willing to either donate breast milk or use DHM to feed their babies. Information on participants' socio-demographic attributes, breastfeeding history, perinatal characteristics, and awareness of human milk banking was collected and analyzed to determine the significance of association with the dependent variables.

4. Operational Definition of Variables

Willingness to donate breast milk:

Acceptance to give out breast milk to a human milk bank.

Willingness to use donor human milk:

Acceptance to feed infants donated human milk from a human milk bank.

Socio-demographic characteristics:

Attributes of the study population based on their social and demographic factors.

Perinatal characteristics: Number of times a woman has given birth.

Breastfeeding history: Previous infant feeding methods during the first six months after birth.

Awareness of human milk banking:

Prior knowledge of the practice of human milk banking.

5. Study Instrument

A pre-tested interview-based questionnaire was used to collect participants' socio-demographic data, maternal history (breastfeeding, perinatal characteristics), awareness of

human milk banking, and other general factors that might influence acceptance to donate breast milk and DHM use.

6. Data Analysis

Findings for this investigation were reported using descriptive statistics including means, frequencies, and percentages while inferential data was presented as the association between predictor variables and outcome variables.

After collection, data was coded, entered, cleaned then analyzed using R-4.3.0 software. The chi-square test was used to assess the initial relationship between independent and dependent variables, with any statistically significant differences being noted. Using multivariate logistic regression model, the odds ratio (OR) at 95% confidence intervals (CIs) for each potential factor influencing acceptance to donate breast milk and acceptance to use DHM were computed. $p < 0.050$ was regarded as statistically significant.

7. Research Ethics

Ethical clearance was sought from Amref Ethical and Scientific Review Committee (REF: AMREF-ESRC P1348/2022). A research permit authorizing the study was granted by the National Council of Science and Technology (License No: NACOSTI/P/23/23495). Written informed consent was obtained from the study participants before enrollment.

RESULTS

1. Sample Characteristics

The mean age of the respondents was 27 years (± 6.3). The majority (78.6%) of the mothers were married and slightly above half (57%) had attained secondary school education. Over two-fifths (44.1%) of the participants were housewives. Their mean monthly household income was KES 14975.2 (± 17618.7). The respondent's socio-demographic, perinatal, and breastfeeding characteristics are shown in Table 1. Only 27.3%

were aware of human milk banking. Sources of information included healthcare workers (69.3%) and the media (19.8%). Table 2

provides details on awareness and experience with human milk banking. The non-response rate for the study was 2%.

Table 1. Socio-demographic, perinatal, and breastfeeding characteristics of participants

Variables	Category	Frequency (n)	Percentage (%)
Residence	Informal urban	206	56
	Formal urban	156	42
	Rural	8	2
Marital status	Single	72	19.5
	Married	291	78.6
	Separated	7	1.9
Respondents age group	< 25 years	145	39.2
	25 – 29 years	100	27
	30 – 34 years	73	19.7
	35 – 39 years	34	9.2
	> 40 years	18	4.9
Education level	No formal education	9	2.4
	Primary school	82	22.2
	Secondary school	211	57
	Tertiary	68	18.4
Income source	Formal employment	77	20.8
	Housewife	163	44.1
	Self-employed	130	35.1
Monthly household income	< 20000 ksh	247	66.7
	20000 – 40000 ksh	95	25.7
	>40000 Ksh	28	7.6
Religion	Christianity	351	94.9
	Islam	19	5.1
Parity	Primiparous	155	41.9
	Multiparous	215	58.1
Previous infant feeding method during the first six months (n=215)			
Breastfeeding only	Yes	184	85.6
	No	31	14.4

Table 2. Awareness and experience with human milk banking

Variables	Frequency (n)	Percentage (%)
Awareness of human milk banking (n=370)		
Aware	101	27.3
Not aware	269	72.7
Source of information (n=101)		
Information provided by healthcare workers	70	69.3
Information from the media (print, electronic)	20	19.8
Talks within the community	18	17.8
Information from the internet	14	13.9
Experience with human milk human milk banking (n=101)		
Previously donated breast milk at an HMB	11	10.9
Previously used donor human milk	12	11.9
Information on the advantages of human milk provided by	70	69.3

Variables	Frequency (n)	Percentage (%)
HCW Information on opportunities to donate breast milk or use DHM provided by HCW	71	70.3

Note: Different n values have been used to indicate a subset of the study population.

The majority (78.1%) of the respondents indicated they would be willing to donate human milk while 70.8% indicated they would feed their babies' donor human milk. Willingness to donate breast milk was primarily (89.1%) attributed to the positive feeling

the mothers would get by helping other babies. Slightly more than half (55.9%) of the respondents who were reluctant to feed their infants donor human milk cited fear of disease transmission (Table 3).

Table 3. Acceptance to donate breast milk and use donor human milk

Variables	Frequency (n)	Percentage (%)
Willingness to donate breast milk at an HMB	289	78.1
Willingness to use donor human milk from an HMB	262	70.8
Reasons Encouraging Breast Milk Donation		
Information received from healthcare workers on human milk banking	299	80.8
Positive feeling for helping other babies in need	303	81.9
Knowing HMBs need breast milk	271	73.2
Support from family/ friends to donate breast milk	278	75.1
Other reasons	36	9.7
Reasons Against Use of Donor Human Milk		
Fear of disease transmission	207	55.9
Fear of genetic mixing	158	42.7
Preference for infant formula	104	28.1
Unhygienic milk collection	178	48.1
Lack of support from family/friends to use DHM	186	50.3
Other reasons	75	20.3

2. Factors Associated with Acceptance to Donate Breast Milk and Use Donor Human Milk

Participant's characteristics and their association with a willingness to donate breast milk and use donated milk were investigated. Chi-square analysis was used to test for significant relationships. There was significant association between respondents age (OR= 12.14; 4df; p=0.016), education level (OR= 16.27; 3df; p=0.001), monthly household income (OR= 7.36; 2df; p=0.025), exclusive breastfeeding of previous infant/s

during the first six months (OR= 4.77; 1df; p=0.029), awareness of human milk banking (OR= 7.27; 1df; p=0.007), and religion (OR= 6.17; 1df; p=0.013) with willingness to donate (Table 4). Significant variables at Chi-square analysis (p<0.050), were considered for multivariate analysis. Age remained a significant predictor of willingness to donate breast milk (OR=0.42; 95% CI= 0.19 to 0.94 p=0.035). Mothers over forty years were less willing to donate as shown in Table 5.

Table 4. Relationship between participant's characteristics and acceptance to donate breast milk

Variable	Willingness to donate				OR	p
	No		Yes			
	N	%	N	%		
Residence						
Informal Urban	47	22.8	159	77.2	1.62	0.446
Formal Urban	31	19.9	125	80.1		
Rural	3	37.5	5	62.5		
Marital status						
Single	18	25.0	54	75.0	0.70	0.704
Married	62	21.3	229	78.7		
Separated	1	14.3	6	85.7		
Age group						
< 25 years	43	29.7	102	70.3	12.14	0.016
25 – 29	13	13	87	87		
30 – 34	16	21.9	57	78.1		
35 – 39	4	11.8	30	88.2		
> 40 years	5	27.8	13	72.2		
Education level						
No formal education	5	55.6	4	44.4	16.27	0.001
Primary school	30	36.6	52	63.4		
Secondary school	37	17.5	174	82.5		
Tertiary	9	13.2	59	86.8		
Income source						
Formal employment	14	18.2	63	81.8	1.38	0.501
Housewife	40	24.5	123	75.5		
Self-employed	27	20.8	103	79.2		
Monthly household income						
< 20000 ksh	64	25.9	183	74.1	7.36	0.025
20000 – 40000	12	12.6	83	87.4		
> 40000 ksh	5	17.9	23	82.1		
Religion						
Christianity	72	20.5	279	79.5	6.17	0.013
Islam	9	47.4	10	52.6		
Parity						
Primiparous	40	25.8	115	74.2	2.01	0.156
Multiparous	41	19.1	174	80.9		
Awareness of human milk banking						
Yes	12	11.9	89	88.1	7.27	0.007
No	69	25.7	200	74.3		
Exclusively breastfed previous infant/s						
Yes	40	21.7	144	78.3	4.77	0.029
No	1	3.2	30	96.8		

Table 5. Multivariate analysis of factors associated with acceptance to donate breast milk

Independent Variable	Categories	OR	CI 95%		P
			Lower limit	Upper Limit	
Age group	< 25 years	Ref	-	-	-
	25 – 29	2.08	0.82	5.27	0.121
	30 – 34	0.60	0.26	1.38	0.229
	35 – 39	0.89	0.35	2.26	0.809
	> 40 years	0.42	0.19	0.94	0.035
Education	No formal education	Ref	-	-	-
	Primary school	2.39	0.80	7.16	0.119
	Secondary school	1.15	0.49	2.72	0.746
	Tertiary	0.70	0.39	1.28	0.244
Monthly household income	< 20000 ksh	Ref	-	-	-
	20000 – 40000	0.76	0.33	1.76	0.517
	> 40000 ksh	0.72	0.35	1.46	0.363
Religion	Christianity	Ref	-	-	-
	Islam	0.39	0.12	1.27	0.118
Awareness of human milk banking	No	Ref	-	-	-
	Yes	2.09	0.99	4.41	0.055

N observation = 370
Log likelihood = -150.48

This study found a significant association between participant’s education level (OR = 12.84; 3df; p=0.005), awareness of human

milk banking (OR = 6.64; 1df; p=0.010), and religion (OR= 9.55; 1df; p=0.002) with acceptance to use donor human milk (Table 6).

Table 6. Relationship between participant’s characteristics and acceptance to use donor human milk

Variable	Willingness to use DHM				OR	p
	No		Yes			
	N	%	N	%		
Residence						
Informal Urban	64	31.1	142	68.9	1.26	0.533
Formal Urban	41	26.3	115	73.7		
Rural	3	37.5	5	62.5		
Marital status						
Single	25	34.7	47	65.3	1.96	0.375
Married	82	28.2	209	71.8		
Separated	1	14.3	6	85.7		
Age group						
< 25 years	48	33.1	97	66.9	3.47	0.483
25 – 29	25	25	75	75		
30 – 34	18	24.7	55	75.3		
35 – 39	10	29.4	24	70.6		
> 40 years	7	38.9	11	61.1		
Education level						
No formal education	6	66.7	3	33.3	12.84	0.005

Variable	Willingness to use DHM				OR	p
	No		Yes			
	N	%	N	%		
Primary school	31	37.8	51	62.2		
Secondary school	49	23.2	162	76.8		
Tertiary	22	32.4	46	67.6		
Income source						
Employed	21	27.3	56	72.7		
Housewife	47	28.8	116	71.2	0.30	0.859
Self-employed	40	30.8	90	69.2		
Monthly household income						
< 20000 ksh	78	31.6	169	68.4		
20000 – 40000	20	21.1	75	78.9	4.30	0.116
> 40000 ksh	10	34.7	18	64.3		
Religion						
Christianity	96	27.4	255	72.6	9.55	0.002
Islam	12	63.2	7	36.8		
Parity						
Primiparous	45	29.0	110	71.0		
Multiparous	63	29.3	152	70.7	0.00	1.000
Awareness of human milk banking						
Yes	19	18.8	82	81.2		
No	89	33.1	180	66.9	6.64	0.010
Exclusively breastfed previous infant/s						
Yes	54	29.3	130	70.7		
No	9	29.0	22	71.0	0.00	1.000

Table 7. Multivariate analysis of factors associated with acceptance to use donor human milk

Independent Variable	Categories	OR	CI 95%		P
			Lower limit	Upper Limit	
Education	No formal education	Ref	-	-	-
	Primary school	2.34	0.85	6.48	0.101
	Secondary school	0.51	0.23	1.14	0.102
	Tertiary	0.75	0.44	1.26	0.273
Religion	Christianity	Ref	-	-	-
	Islam	0.27	0.10	0.72	0.009
Awareness of human milk banking	No	Ref	-	-	-
	Yes	0.89	1.07	3.36	0.029

N observation = 370
Log likelihood = -210.19

Table 7 shows variables with a $p < 0.050$ were considered for multivariate analysis. Awareness of human milk banking was significantly associated with willingness to use donated breast milk (OR=0.89; 95% CI= 1.07 to 3.36; $p=0.029$). Respondents who were aware of human milk banking were less willing to use

DHM compared to those who were unfamiliar with the practice. Additionally, religion remained a significant predictor of willingness to use donated breast milk (OR =0.27; 95% CI= 0.10 to 0.72; $p=0.009$). Muslim mothers were less willing to use donated milk compared to Christian mothers.

DISCUSSION

Overall, we found a low degree of awareness on human milk banking among the study population. The awareness level observed is slightly higher than what was recorded in a feasibility study in the country which was conducted before the start of the only HMB in Kenya (Kimani-Murage et al., 2019). The increase in awareness observed in our study might be attributed to the current human milk banking activities at the study site which may have exposed mothers to the practice. Similar studies conducted in other countries have also established low human milk banking awareness (Abhulimhen-Iyoha et al., 2015; Iloh et al., 2018; Bhoola and Biggs, 2021; Namuddu et al., 2023). Given that DHM is becoming a more popular feeding substitute for babies with no or limited access to MOM, it is crucial to raise awareness of human milk banking and the advantages of DHM to attract donor mothers and potential recipients. Proper characterization of potential donors and recipients is essential for administering successful promotional campaigns on human milk banking.

Accordingly, our study's findings that health professionals were the most popular information source on human milk banking corresponds with a survey conducted in south-south Nigeria (Abhulimhen-Iyoha et al., 2015). Contrarily, other studies conducted in developed countries have reported the media as the primary information source on the practice (Gürol et al., 2014; Zhang et al., 2020). These differences might be based on the fact that human milk banking has not yet received much attention from mainstream media in most developing countries. Promoting awareness of the significant contribution of DHM as well as addressing cultural beliefs and misconceptions among community members is a key approach to boosting communities' acceptance of human milk banking

practice (Gürol et al., 2014). Considering the speed and ease of reach of the target population, credible media sources should be fully utilized to promote human milk banking. The inclusion of healthcare providers in championing not only breastfeeding but human milk banking as well might have a very favorable impact on the number of donor mothers and recipients as well as the sustainability of HMBs.

This research established that participants who were aware of human milk banking were less willing to use DHM compared to those who were unfamiliar with the practice. A possible explanation for hesitance to use DHM would be fear of disease transmission to their infants. As much as these participants knew about human milk banking, most probably they weren't knowledgeable about the process hence concerns regarding the efficacy of donor human milk. Contrary, studies conducted in Ethiopia, southeastern Nigeria, and Wuhan, China found that acceptance of DHM was positively associated with awareness of human milk banking (Gelano et al., 2018; Iloh et al., 2018; Zhang et al., 2020). This shows that with the right information regarding DHM processing and the safety of donated human milk, more women would probably utilize DHM. Although a rare practice, some communities in the country are familiar with wet nursing, hence donation of breast milk and its use is not a new practice. This could be used to support and strengthen human milk banking advocacy campaigns emphasizing the fact that HMBs make sure donated breast milk undergoes a rigorous procedure making it safer for babies with no access to MOM.

Most of the women interviewed had minimal experience with DHM use and breast milk donation. A small proportion of mothers had previously donated breast milk as well as used DHM for their babies. This

corresponds to a nationwide survey among women living in America, where it was found most women interviewed had not previously donated breast milk or utilized donor human milk for their newborns through the mother-to-mother milk sharing program (Parker et al., 2013). We were able to establish that mothers who had infants at the Special Care Nursery (SCN) at our study site had a higher likelihood of DHM use. This conclusion is in line with the rise in DHM use in caring for preterm babies over the previous decade (Kim and Unger, 2010). According to a national survey conducted in 2013, nearly half of Neonatal Intensive Care Units (NICUs) in America used DHM largely to lower the incidence of necrotizing enterocolitis in premature babies who were unable to access their mother's milk (Parker et al., 2013). The need for DHM is anticipated to rise due to the current expansion of DHM use among NICUs and SCNs, which will increase the need for breast milk donation. To ensure a steady supply of DHM, it would be crucial to raise awareness of the different settings in which DHM is used including opportunities for donating breast milk.

This research highlighted the potential acceptance of human milk banking. This could be attributed to a sizable proportion of respondents who supported the practice of breast milk donation as well as the many positive responses regarding the utilization of DHM as the preferred alternative nutrition source where MOM was inadequate or unavailable. Kimani-Murage et al reported similar results in the country in a study conducted before the HMB establishment (Kimani-Murage et al., 2019). Similar observations were reported in studies conducted in Turkey, China, and India (Ekşioğlu et al., 2015; Tu et al., 2022; Melwani et al., 2018). Mother's primary motivation for donating breast milk was the positive feeling they would get by helping other babies in need.

Many participants were against the financial compensation of donor mothers. Similar reports from France (Azema and Callahan, 2003) and Southeast China (Tu et al., 2022) show that mothers' motivation to give breast milk was primarily altruistic rather than motivated by financial gain.

Considering human milk banking is uncommon in many developing countries, the bright outlook regarding the practice was not without drawbacks. Even though most mothers were positive regarding donating human milk to an HMB, some were reluctant to utilize breast milk donated by other lactating women citing the potential spread of diseases. The worry about the safety of DHM corresponds to observations from studies done in Nigeria, South Africa, Australia, and Turkey (Ighogboja et al., 1995; Coutsoudis et al., 2011; Mackenzie et al., 2013; Ekşioğlu et al., 2015) where concerns about the efficacy of the DHM was singled out as major obstacles to DHM acceptance. To ensure the efficacy of DHM, the use of standardized hazard management practices to inform the development of operating protocols for donor mother screening, DHM processing, and appropriate use of donated milk is needed (De Nisi et al., 2015; Hartmann et al., 2007; NICE, 2010).

Findings of our study indicated older mothers were less willing to donate breast. Furthermore, education level did not influence willingness to either donate or utilize donated breast milk. Contrary, the results of a New York study that examined postpartum women's attitudes toward DHM found that the majority of participants with higher education agreed that DHM is more advantageous to babies (Pal et al., 2019). Studies conducted in southeast Nigeria, and China showed that highly educated mothers had a greater likelihood of knowing about DHM and participating in human milk banking practice (Iloh et al., 2018; Tian et al., 2021).

Our study indicated parity had no significant influence on participants' likelihood of either donating human milk or using DHM. These findings correspond to the results of similar studies carried out in KwaZulu Natal, South Africa, and Southeast China (Bhoola and Biggs, 2021; Tu et al., 2022).

Human milk banking is a relatively new health practice and one that involves sensitive biological fluids. It is critical to assess the influence of socio-cultural concerns, especially in the African setup where diverse cultures and religions may interfere with its applicability. In our study, religion was a significant predictor of willingness to use DHM. The belief that infants less than two years old who receive breast milk from the same mother are regarded as her biological children despite their lack of kinship could be attributed to the smaller percentage of Muslim women who would feed their infants DHM compared to Christian mothers (Ramli et al., 2010). These limitations were also observed in studies conducted in Turkey (Ekşioğlu et al., 2015; Gürol et al., 2014). In an investigation carried out in predominantly Muslim countries, religious authorities stated that the use of DHM could only be approved if it originated from one known donor or a donor pool of not more than three mothers (Khalil et al., 2016). This demonstrates how important socio-cultural beliefs are in determining acceptance of DHM use and breast milk donation (Kimani-Murage et al., 2019). As a result, a collaborative strategy involving all stakeholders, including the community, health professionals, and religious leaders is needed to create effective and focused advocacy and communication campaigns regarding human milk banking (Amundson et al., 2017).

AUTHOR CONTRIBUTION

Conceptualization of the study: Jane Wanjiku Kanyi, Alice Sipiyan Lakati,

Theresa Odero. Methodology: Jane Wanjiku Kanyi, Alice Sipiyan Lakati, Theresa Odero. Data collection, analysis, and interpretation: Jane Wanjiku Kanyi. Drafting of the manuscript: Jane Wanjiku Kanyi. Review of the draft manuscript: Alice Sipiyan Lakati, Theresa Odero. Final proofreading and approval of manuscript: Jane Wanjiku Kanyi, Alice Sipiyan Lakati, Theresa Odero.

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CONFLICT OF INTEREST

There are no conflicts of interest.

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