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

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**Background:** World Health Organization advocates donor human milk as a superior substitute for newborns unable to obtain mother's milk. Calls have been made for the scale-up of human milk banks to provide infants without access to mother's milk safe donor human milk.

**Research aim:** To assess determinants of human milk donation and use among postpartum women at a city hospital with human milk banking facilities.

**Methods:** This was a cross-sectional study. Consecutive sampling method was used to recruit three hundred and seventy mothers. Data was collected using a pre-tested interview-based questionnaire. Data was analyzed using R-4.3.0 software and descriptive statistics were done for all variables. Further inferential statistics including Chi-Square test and multivariate logistics regression were computed with significance level set at $\alpha=0.05$.

**Results:** The mean age of the participants was 27 years ($\pm 6.3$). A majority (78.6%) of the women were married and slightly above half (57%) had attained secondary school education. Only 27.3% were aware of human milk banking. Mother's willingness to donate human milk and use donor human milk was 78.1% and 70.8% respectively. The respondent's age (OR 0.423; 95% CI 0.19-0.942) was significantly associated with willingness to donate. Religion (OR 0.266; 95% CI 0.097-0.718) and prior knowledge of human milk banking (OR 0.894; 95% CI 1.066-3.364) 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 human milk as well as feed their infants' donor human milk.

## Background

Human 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 human milk makes it crucial especially for premature and underweight newborns, whose weak immune systems are essential to their survival (Sánchez et al., 2021). Other health advantages associated with human milk 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).

Human 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 for a non-breastfed child is six times higher compared to that of a breastfed infant in developing countries, it is evident that 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). The most popular method of giving human milk to infants is through breastfeeding or using expressed mother's milk.

However, not all mothers can breastfeed their babies 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 (Victora et al., 2016). These neonates are susceptible to adverse health outcomes due to complications that are preventable or treatable with simple and affordable interventions such as the provision of human milk.

In instances where mother's milk 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 (World Health Organization, 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 the latter 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 in place of infant formula where utilization of mother's milk is not a viable option, WHO issued a call for the scale-up of HMBs to provide babies who lack access to mother's milk safe DHM (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). For instance, since milk banks were incorporated into Brazil's newborn health strategy, there has been a dramatic 73% decrease in neonatal mortality between 1990 and 2013 (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 on the practice among the public. According to research conducted in countries including South Africa and Nigeria, participants who demonstrated awareness of human milk banking were more conversant with the procedures and hence more likely to donate or utilize DHM (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 (Arianna 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 fragmented institutions, lack of policy support from the government, unfavorable community and maternal attitude towards human milk banking, and detrimental traditions that frequently hinder the success of HMBs (McCloskey & 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, human milk has the biggest possible effect on child survival (Wu & Clark, 2016).The improvement of lactation practices thus, mo-

2

ther's milk availability, 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 recently at 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. The ministry of health also incorporated DHM in its policy framework as the superior alternative to mother's milk.

Promoting awareness of the significant contribution of DHM as well as addressing cultural beliefs and misconceptions among community members through the provision of adequate information is considered a key approach to boosting communities' acceptance of human milk banking. Public sensitization is also an important factor which contributes to the successful establishment and sustainability of HMBs (Gürol et al., 2014).

In Kenya currently, limited literature is available citing the awareness and acceptance of the practice of human milk banking. This study seeks to address this significant evidence gap by determining the awareness and acceptance level of the practice. Furthermore, it will evaluate determinants of human milk donation and use of the donated milk among postpartum mothers. The evidence generated from this research is crucial for guiding the establishment of additional HMBs in the country, including the formulation of operational standard procedures for human milk banking, integration HMBs into the healthcare system, and the creation of effective and focused advocacy and communication campaigns regarding human milk banking (Amundson et al., 2017).

## Method

### Research Design

A cross-sectional study design was used where information was obtained from study subjects at a single point in time. The method provided a snap chat of the current situation and there was no loss to follow-up.

Ethical clearance was sought from Amref Ethical and Scientific Review Committee (Approval number: ESRC P1348/2022). Research permit authorizing the study was granted by the National Council of Science and Technology.

### Setting

The research was conducted at the Pumwani Maternity Hospital, a Ministry of Health primary care facility in Nairobi County. With an average of one hundred and twenty deliveries per day, it is Kenya's largest specialized referral hospital dedicated to maternity and newborn care. The facility mostly serves women from Nairobi and the surrounding counties who are low and middle-income earners.

The first HMB in Eastern Africa was established at this hospital as a pilot project to support and promote breastfeeding among nursing mothers while at the same time facilitating the supply of safe DHM to at-risk newborns without access to mother's milk.

### Sample

The study population were postpartum women receiving care at the Pumwani Maternity Hospital. Postpartum women above eighteen years admitted at the hospital's postnatal wards including those referred from different hospitals during the research period were considered to 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 respond to the survey were excluded from this study.

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).

3

Single population proportion formula was used to estimate the sample size with a 95% confidence level and 5 % margin of error. Consecutive sampling technique was used to recruit three hundred and seventy mothers exceeding the necessary minimum sample needed.

**Measurement**

Pre-tested interview-based questionnaire was used to collect participant's socio-demographic data, maternal history (breastfeeding, perinatal characteristics), awareness on human milk banking and other general factors that might influence acceptance to donating human milk and using donated milk in infant feeding. Before the questionnaire was used to collect actual data, it was pretested on 5% of the total sample size in a location other than the actual study site. After pretesting, the questionnaire was reviewed, and corrections were made to better align it with the objectives of the study. The research assistants received training to ensure consistency in recording responses and asking survey questions. Every day, all the questionnaires were reviewed to make sure they had been filled correctly. Before the commencement of the interviews the next day, any missing data was verified.

**Data collection**

Collection of data was carried out between May 2023 and June 2023. The lead researcher together with four research assistants carried out the data collection. The research assistants received training before commencement of data collection on the identification of eligible participants, obtaining informed consent, and conducting the interviews. The inclusion-exclusion criteria were used to identify potential study participants after which the researcher gave a detailed explanation of the aim of the study to the participants and what was required of them. The participants were then asked for their informed consent. After receiving consent, a physical interview was carried out with the research subjects using a pretested questionnaire which captured their bio-data and other relevant information of interest to the study.

**Data analysis**

R-4.3.0 software was used to analyze data. Descriptive statistics were done for all variables. Chi-square test was used to compare categorical data, with any statistically significant differences noted. Using multivariable logistic regression analysis, the odds ratio (OR) at 95% confidence intervals (CIs) for each potential factor influencing willingness to donate human milk and willingness to use DHM were computed. $P < 0.05$ was regarded as statistically significant for this study.

The findings of this study were reported using descriptive statistics including frequencies and percentages. Means and standard deviations served as indicators of central tendency and spread, respectively.

**Results**

**Characteristics of the study population**

The mean age of the respondents was 27 years ($\pm6.3$). Majority (78.6%) of the women 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 ($\pm17618.7$). The socio-demographic, perinatal and breastfeeding characteristics of the respondents are shown in Table 1. Only 27.3% were aware of human milk banking. Sources of information were mainly hospital staff (69.3%) and the media (19.8%). Table 2 provides details on awareness and experience with human milk banking.

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).

**Factors Associated With Acceptance to Donate Human Milk and Use Donor Human Milk**

Participant's characteristics and their association with willingness to donate human milk and use donated milk were investigated. Chi-square analysis was used to test for significant relationships. There was significant association between respondents age (P=0.016), education level (P= <0.001), monthly household income (P=0.025), exclusive breastfeeding of previous infant/s during the first six months (P=0.029), prior knowledge of human milk banking (P=0.007), and religion (P=0.013) with willingness to donate (Table 4). Significant variables at Chi-square analysis (p < 0.05), were entered into the multivariable logistic regression model. Age (P=0.035) remained a significant predictor of willingness to donate human milk as shown in Table 5.

This investigation found a significant association between participant's education level (P=0.005), prior knowledge of human milk banking (P=0.010) and religion (P= 0.002) with the likelihood of using donor human milk (Table 6). These variables with a P value < 0.05 were considered for multivariable logistic regression analysis. Prior knowledge of human milk banking (P=0.029) and religion (P=0.009) were found to be significantly associated with willingness to use DHM (Table 7).

## Discussion

Overall, we found a low degree of human milk banking awareness among the study population given that only 27.3% of the participants had prior knowledge of the practice. The awareness level observed is slightly higher than what was recorded in a feasibility study in the country which was conducted before the establishment of the only HMB in Kenya. This study reported 23% of the respondents who took part in the quantitative survey knew about the practice of human milk banking (Kimani-Murage et al., 2019). The increase in awareness observed in our study may be due 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 established low human milk banking awareness. A study among postnatal mothers in KwaZulu Natal, South Africa reported that only 18.9% of mothers interviewed had prior knowledge of human milk banking (Bhoola & Biggs, 2021). A study among pregnant women in Uganda indicated that only 24.6% of respondents knew about human milk banking (Namuddu et al., 2023). Additionally, a study in Southeast China revealed that only 17% of postpartum women interviewed knew about human milk banking (Tu et al., 2022).

Accordingly, our study's findings that health professionals were the most popular information source regarding human milk banking are in line with findings from another study conducted in south-south Nigeria (Abhulimhen-Iyoha et al., 2015). Contrarily, a survey in Turkey found that 85.7% of respondents' information sources for human milk banking came from the media (Gürol et al., 2014). These differences might be attributed to mothers in developed countries having greater access to electronic media and internet compared to their counterparts in resource-constrained regions.

Participants with human milk banking knowledge were more inclined to accept DHM compared to those who had no prior knowledge about it. In a comparable mixed-method study conducted in Ethiopia, women who were aware of the practice were 5.8 times more inclined to use DHM in comparison with those without prior knowledge of the practice (Gelano et al., 2018). A cross-sectional survey in Nigeria found that acceptance of donor human milk was significantly predicted by knowledge of human milk banking (Iloh et al., 2018). According to a study conducted in Wuhan, China, being knowledgeable on human milk banking was a significantly associated with acceptance of DHM (Zhang et al., 2020). Furthermore, another research conducted in Southeast China showed prior knowledge of the practice was showed positive association with willingness to accept DHM (Tu et al., 2022).

Most of the women interviewed had minimal experience with the use of DHM and human milk donation. Only 10.9% of mothers had previously donated while 11.9% reported to have used donor human milk to feed their infants. This corresponds to a nationwide survey among women living in America, where it was recorded that 12% of those interviewed had previously donated human milk at an HMB and 6.8% had utilized donor human milk for their newborns through the mom-to-mom milk sharing initiative (O'Sullivan et al., 2018).

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 having used DHM. This conclusion is in line with the rise in DHM use in caring for preterm babies across many developed nations over the previous decade. Based on a nationwide survey conducted in 2013, 45% 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 mother's milk (O'Sullivan et al., 2018). Clinical demand for DHM is anticipated to rise due to the current expansion of DHM use among NICUs and SCNs, which will increase the need for human milk donation. To ensure a steady supply of DHM, it will be crucial to raise awareness of the different settings in which DHM is used including opportunities for donating human milk.

The investigation highlighted the feasibility of human milk banking practice. The majority (70.8%) of the women indicated they would give their infants' donor human milk, while 78.1% were open to the prospect of donating human milk. Kimani-Murage et al reported similar results in the country, stating that 59% of respondents would use DHM to feed their babies and 79% of respondents would donate their breast milk (Kimani-Murage et al., 2019). This observation is similar to that of a research carried out in southeast China among women, which found that 44.6% of the participants were open to using DHM to feed their babies and 73.4% of the participants would donate breast milk at an HMB (Tu et al., 2022). Similar research where 448 mothers in Izmir, Turkey were interviewed revealed that 71.3% would accept DHM and 68.8% would donate human milk to an HMB (Ekşioğlu et al., 2015).

Mother's primary reason for acceptance to donate human milk was to help babies in need. Many participants were against the financial compensation of human milk donors. Similar findings from Southeast China (Tu et al., 2022) show that mothers' motivation to donate 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 participants were positive about human milk donation, some were reluctant to feed their babies milk donated by other lactating women citing fear of disease transmission. The worry about the safety of DHM corresponds to findings from studies in South Africa, and Turkey (Coutsoudis et al., 2011; Ekşioğlu et al., 2015) where concerns about the safety of DHM especially in settings with high HIV/AIDs prevalence were singled out as major obstacles to DHM acceptance. Similar to our study findings, most mothers in Australia reported they would give their infants' DHM if they had the surety it was safe (Mackenzie et al., 2013).

Mother's preference for donating breast milk over using human donor milk is noteworthy, nevertheless. This can be explained by the maternal protective instinct; while the satisfaction of helping another infant in need makes them inclined to donate human milk, their worry of spreading disease to their babies discourages them from using DHM.

Highly educated participants were more inclined to donating human milk as well as using DHM for infant feeding. These results are comparable to those of a New York study that examined postpartum women's attitude towards DHM and found that 64% 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 mothers who are educated are more likely to know about DHM and to participate in human milk banking (Iloh et al., 2018; Tian et al., 2021)

## Limitations

This investigation was carried out in a government hospital that mostly serves women who are low and middle-income earners. As such, the findings might not be generalizable to other Kenyan contexts. Additionally, the high acceptance level recorded in our study could be explained by the current human milk banking activities at the study site which may have exposed mothers to the practice.

Given that this research was conducted at a hospital, the opinions of women in other setups may differ. We recommend further research at the community level with all relevant stakeholders involved.

## Conclusions

Although mothers surveyed were highly likely to accept the practice of human milk banking, awareness, knowledge, and experience with this topic was limited. Given that donor human milk is becoming a more popular alternative feeding option for newborns without access to mother's milk, it is paramount to promote 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 administrating successful promotional campaigns on human milk banking. The inclusion of healthcare providers in championing not only for breastfeeding but also human milk banking could positively impact the number of potential donors and users as well as the sustainability of HMBs.

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

| Variables | Category |
| --- | --- |
| Residence | Informal urban |
| | Formal urban |
| | Rural |
| Marital status | Single |
| | Married |
| | Separated |
| Respondents age group | < 25 years |
| | 25 – 29 years |
| | 30 – 34 years |
| | 35 – 39 years |
| | > 40 years |
| Education level | No formal education |
| | Primary school |
| | Secondary school |
| | Tertiary |
| Income source | Formal employment |
| | Housewife |
| | Self-employed |
| Monthly household income | < 20000 ksh |

| Variables | Category |
|---|---|
|  | 20000 – 40000 ksh |
| Religion Parity | Christianity Islam |
| **Previous infant feeding method during the first six months (n=215)** Exclusive breastfeeding | Yes No |

Table 2: **Awareness and experience with human milk banking**

| Variables | n (%) |
|---|---|
| Prior knowledge of human milk banking (n=370) | 101 (27.3) |
| **Source of information on human milk banking (n=101)** Staff at clinics/hospitals | 70 (69.3) |
| Media (print, electronic) | 20 (19.8) |
| Talk within the community Internet | 18 (17.8) 14 (13.9) |
| Previously donated human milk at an HMB | 11 (10.9) |
| Previously used donor human milk | 12 (11.9) |
| Information on advantages of human milk provided by healthcare worker | 70 (69.3) |
| Information on opportunities to donate human milk and use of DHM provided by HCW | 71 (70.3) |

Table 3: **Acceptance to donate human milk and use donor human milk**

| Variables | n=370 |
|---|---|
|  | n (%) |
| Willingness to donate human milk at an HMB | 289 (78.1) |
| Willingness to use donor human milk from an HMB | 262 (70.8) |

**Reasons encouraging human milk donation at HMB**

| Information received from hospital staff on human milk banking | 299 (80.8) |
|---|---|
| Positive feeling for helping other babies in need | 303 (81.9) |
| Knowing HMBs need human milk | 271 (73.2) |
| Support from family/ friends to donate human milk Other reasons | 278 (75.1) 36 (9.7) |
| **Reasons against use of donor human milk from HMB** |  |
| Fear of disease transmission | 207 (55.9) |
| Fear of genetic mixing | 158 (42.7) |
| Preference of infant formula | 104 (28.1) |

10

| Information received from hospital staff on human milk banking | 299 (80.8) |
|---|---|
| Unhygienic milk collection | 178 (48.1) |
| Lack of support from family/friends to use DHM Other reasons | 186 (50.3) 75 (20.3) |

Table 4: **Relationship between participant's characteristics and acceptance to donate human milk**

| Variables | Category | Willingness to donate Yes | No | Total | Chi square Value | p |
|---|---|---|---|---|---|---|
| Residence | Informal urban | 159 (77.2) | 47 (22.8) | 206 | 1.615 | 0.446 |
| Marital status Age group Education level | Formal urban Rural Single Married Separated < 25 years 25 – 29 30 – 34 35 – 39 > 40 years No formal education Primary school Secondary school Tertiary | 125 (80.1) 5 (62.5) 54 (75.0) 229 (78.7) 6 (85.7) 102 (70.3) 87 (87) 57 (78.1) 30 (88.2) 13 (72.2) 4 (44.4) 52 (63.4) 174 (82.5) 59 (86.8) | 31 (19.9) 3 (37.5) 18 (25.0) 62 (21.3) 1 (14.3) 43 (29.7) 13 (13) 16 (21.9) 4 (11.8) 5 (27.8) 5 (55.6) 30 (36.6) 37 (17.5) 9 (13.2) | 156 8 72 291 7 145 100 73 34 18 9 82 211 68 | 0.702 12.139 16.266 | 0.704 0.016 <0.001 |
| Income source Monthly house hold income Religion Parity Prior knowledge of human milk banking Exclusively breastfed previous infant/s | Formal employment Housewife Self-employed < 20000 ksh 20000 – 40000 > 40000 ksh Christianity Islam Primiparous Multiparous Yes No Yes No | 63 (81.8) 123 (75.5) 103 (79.2) 183 (74.1) 83 (87.4) 23 (82.1) 279 (79.5) 10 (52.6) 115 (74.2) 174 (80.9) 89 (88.1) 200 (74.3) 144 (78.3) 30 (96.8) | 14 (18.2) 40 27 (24.5) 64 (20.8) 12 (25.9) 5 (12.6) 72 (17.9) 9 (20.5) 40 (47.4) 41 (25.8) 12 (19.1) 69 (11.9) (25.7) 40(21.7) 1 (3.2) | 77 163 130 247 95 28 351 19 155 215 101 269 184 31 | 1.382 7.364 6.169 2.013 7.273 4.768 | 0.501 0.025 0.013 0.156 0.007 0.029 |

Table 5: **Multivariable analysis of factors associated with acceptance to donate human milk**

| Variables | Categories | OR | C.I Lower Upper | C.I Lower Upper | C.I Lower Upper | C.I Lower Upper | P value |
|---|---|---|---|---|---|---|---|
| Age group | < 25 years | Reference | Reference | - 0.823 | - 5.271 | | - 0.1214 |
| Education | 25 – 29 30 | 2.083 | 2.083 | 0.262 | 1.377 | | 0.2286 |
| Monthly | – 34 35 – | 0.601 | 0.601 | 0.352 0.19 | 2.261 | | 0.8093 |
| household | 39 > 40 | 0.892 | 0.892 | - 0.799 | 0.942 - | | 0.0351 - |
| income | years No | 0.423 | 0.423 | 0.488 | 7.158 | | 0.1193 |
| Religion | formal | Reference | Reference | 0.385 - | 2.721 | | 0.7455 |
| Prior | education | 2.391 | 2.391 | 0.326 | 1.275 - | | 0.2438 - |
| knowledge | Primary | 1.153 0.7 | 1.153 0.7 | 0.354 - | 1.757 | | 0.5169 |
| of human | school | Reference | Reference | 0.12 - | 1.463 - | | 0.363 - |
| milk | Secondary | 0.757 | 0.757 | 0.986 | 1.268 - | | 0.1175 - |
| banking | school | 0.719 | 0.719 | | 4.41 | | 0.0545 |
| | Tertiary < | Reference | Reference | | | | |
| | 20000 ksh | 0.39 | 0.39 | | | | |
| | 20000 – | Reference | Reference | | | | |
| | 40000 > | 2.085 | 2.085 | | | | |
| | 40000 ksh | | | | | | |
| | Islam | | | | | | |
| | Christian- | | | | | | |
| | ity No | | | | | | |
| | Yes | | | | | | |

Table 6: **Relationship between participant's characteristics and acceptance to use donor human milk**

| Variables | Category | Willingness to use DHM Yes | No | Total | Chi square value | p |
|---|---|---|---|---|---|---|
| Residence | Informal urban | 142 (68.9) | 64 (31.1) | 206 | 1.258 | 0.533 |
| | Formal urban | 115 (73.7) | 41 (26.3) | 156 | | |
| | Rural | 5 (62.5) | 3 (37.5) | 8 | | |

| Variables | Category | *Willingness to use DHM* Yes | No | Total | Chi square value | p |
|---|---|---|---|---|---|---|
| Marital status Age group Education level Income source Monthly household income Religion Parity Prior knowledge of HMBs | Single Married Separated < 25 years 25 – 29 30 – 34 35 – 39 > 40 years No formal education Primary school Secondary school Tertiary Employed Housewife Self-employed < 20000 ksh 20000 – 40000 > 40000 ksh Christianity Islam Primiparous Multiparous Yes No | 47 (65.3) 209 (71.8) 6 (85.7) 97 (66.9) 75 (75) 55 (75.3) 24 (70.6) 11 (61.1) 3 (33.3) 51 (62.2) 162 (76.8) 46 (67.6) 56 (72.7) 116 (71.2) 90 (69.2) 169 (68.4) 75 (78.9) 18 (64.3 255 (72.6) 7 (36.8) 110 (71.0) 152 (70.7) 82 (81.2) 180 (66.9) | 25 (34.7) 82 (28.2) 1 (14.3) 48 (33.1) 25 (25) 18 (24.7) 10 (29.4) 7 (38.9) 6(66.7) 31 (37.8) 49 (23.2) 22 (32.4) 21 (27.3) 47 (28.8) 40 (30.8) 78 (31.6) 20 (21.1) 10 (34.7) 96 (27.4) 12 (63.2) 45 (29.0) 63 (29.3) 19 (18.8) 89 (33.1) | 72 291 7 14 100 73 34 18 9 82 211 68 77 163 130 247 95 28 351 19 155 215 101 269 | 1.962 3.469 12.838 0.304 4.301 0.00 9.55 6.635 | 0.375 0.483 0.005 0.859 0.116 0.002 1.000 0.010 |
| Exclusively breastfed previous infant/s | Yes No | 130 (70.7) 22 (71.0) | 54 (29.3) 9 (29.0) | 184 31 | 0.00 | 1.000 |

Table 7: **Multivariable analysis of factors associated with acceptance to use donor human milk**

| Variables | Categories | OR | C.I Lower Upper | C.I Lower Upper | C.I Lower Upper | C.I Lower Upper | P value |
|---|---|---|---|---|---|---|---|
| Education Religion Prior knowledge of human milk banking | No formal education Primary school Secondary school Tertiary Islam Christian-ity No Yes | Reference 2.343 0.51 0.745 Reference 0.2663 Reference 0.894 | Reference 2.343 0.51 0.745 Reference 0.2663 Reference 0.894 | - 0.848 0.228 0.44 - 0.097 - 1.066 | - 6.476 1.143 1.261 - 0.718 - 3.364 | | - 0.1006 0.1019 0.2726 - 0.0091 - 0.0294 |

13