Acceptability to donate human breast milk among post-natal mothers at St Francis hospital Nsambya Uganda: A mixed method study

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Abstract

Background

Whereas the World Health Organisationrecommends use of donated Human Breast Milk (HBM) as the second best option for preterm babies, whose mothers lack breast milk, HBM donation is not a practice in Uganda. We assessed the level of and factors associated with acceptance to donate HBM among postnatal mothers at St. Francis Hospital Nsambya (SFHN).

Methods

A cross-sectional sequential explanatory mixed method study was used. A questionnaire on socio-demography, awareness and likely acceptability to donate HBM was administered to 410 postnatal mothers at SFHN. Data was entered in Epi Info 7 and analysed using STATA version 13 for multivariate logistic regression to predict factors for acceptance to donate HBM. Focus Group Discussions (4) and Key Informants Interviews (4) were used to explore factors influencing behaviours to donate HBM. Qualitative data was analysed using content thematic approach.

Results

Overall the acceptance to donate HBM was 77.6% and the significant factors were; willingness to express HBM (aOR 7.5,95%CI: 3.01 -18.); wet-nursing knowledge (aOR 2.3,95%CI: 1.1–5.0) and under-5 years clinic visit (aOR 21.3, 95% CI: 2.3–196.9). Emerging themes for accepting to donate HBM were; wet-nursing experience, confidence to donate HBM and its perceived effectiveness. There were concerns about safety and adequacy of HBM, fear to transmit criminality and mental illness through HBM.

Conclusion

Acceptance to donate HBM among postnatal mothers at St. Francis Hospital Nsambya was very high. Willingness to express and store breast milk, prior knowledge about wet nursing and visit to an under five OPD were associated with acceptance. Thus establishing a HBM bank is feasible.

Background

Early breast feeding plays a very important role in the infant immune system development and maturation [1]. Breast fed preterm infants have been observed to display feeding tolerance, develop fewer severe infections and fewer episodes of necrotizing enter colitis (NEC), experience decreased lengths of hospital stay [2]. According to the World Health Organisation, low birth weight (LBW) infants should be fed mother’s own milk and where not possible, expressed breast milk from a donor mother [3].The first method used to address breast milk shortage was “wet nursing method” and later “formal milk banking

”was introduced [4],to use pasteurized donor human milk(PDHM) as standard, since then over 500 human milk banks have been established with most being in Europe and USA with two hundred and six (206) being in Europe, forty four (44) in Asia, four (4) in Australia and seventy (70) in Africa. Of those in Africa, sixty (60) are in South Africa, six (6)in Cameroon, one (1) planned in Kenya and one (1) in Nigeria [5]. There is wide variation of the acceptance of HBM worldwide ranging from 11% in Nigeria to 84% in India. Several factors have been identified to be associated with donating human breast milk. In Ethiopia the acceptance of donor milk banking was 5.8 times more likely among mothers who had heard about donor milk banking previously (AOR 5.8; 95% CI 3.1, 10.72), 4.2 times more likely among mothers who had heard about wet-nurses (AOR 4.2; 95% CI 2.5, 6.99) and 2 times more likely among mothers who had visited a neonatal intensive care unit (AOR 2; 95% CI 1.1, 3.73) [6]. Encouragement of breast milk donation by healthcare professionals, receiving information on breast milk expression by the health care unit, and getting help from the health professionals to breastfeed were also associated with a higher prevalence of HBM donation. Admission of the new-born to the neonatal unit has been associated with a lower prevalence of HBM donation [7]. The most common characteristics of a regular donor were having 4 to 7 pregnancies (relative risk [RR] = 1.9285; 95% confidence interval [CI] = 1.039–3.58) and having obtained a higher education level (RR = 2.06; 95% CI = 1.01–4.21). Commonly reported reasons for donating HBM were "encouragement of a health professional" (61.3%) and "knowing the needs of the babies in the nicu" (25.3%). Most of the donors (49.9%) were introduced during their stay in the hospital to the human milk bank to which they donated, and 25.8% chose the bank recommended by a health professional. Health professionals play an indispensable role in motivating mothers to become human milk donors [8]. Reasons for not accepting DHM included fear to transmit diseases (28%), fear of transfer of genetic traits (22 percent) and religious and cultural taboos (14 percent) [9]. In addition were concerns about the safety of donor breast milk and discomfort about using another mother's milk. Participants believed that education on the importance of breast milk and transparency on the processes involved in sourcing and preparing donor milk would improve the acceptability [10]. At St Francis Hospital Nsambya, donated expressed breast milk for preterm babies has been in use since 2016 by locally improvised methods to get the donated milk and have noted significant reduction in the rate of Necrotizing enterocolitis (Nsambya Hospital, 2018) .With the increasing number of Preterm babies, the local methods may not be able to meet the need of the amount of breast milk required. Therefore, human breast milk bank was proposed at the time of this study. With the advantages of breast milk donation and breast milk banks internationally and regionally infants can receive the ideal food for their growth and development through breast milk banks if it is available. However, there is no official way of breast milk donation for breastfeeding mothers in Uganda. Within the context of the proposed initiation of a breast milk bank at Nsambya Hospital, this study assessed the level of acceptance to donate breast milk as well as the barriers and enablers for breast milk donation. The findings of this study will be used to influence the process of breast milk donation for a future breast milk bank and improving breastfeeding practices at St Francis Hospital Nsambya.

METHODS

Study design

This was a cross sectional, mixed methods study conducted at St. Francis Hospital Nsambya between October 2018 and March 2019. The quantitative part assessed the level of acceptance and factors associated with human breast milk donation while the qualitative part of the study explored enablers and barriers that influence acceptance to donate breast milk.

Study setting

St. Francis Hospital Nsambya is a 361 bed capacity, Private-Not-For-Profit, tertiary and teaching hospital located in Makindye division of Kampala Capital City. The hospital provides both inpatient and outpatient service. St. Francis Nsambya Hospital has an approximate catchment population of 250,000 with about 14,000 admissions and antenatal attendance of 22,000 per year (Hospital records 2018). About 400-500 deliveries are conducted per month which totals to 5500 deliveries annually [11].The Paediatrics department offers neonatal services including neonatal intensive care unit (NICU) with 16 beds and a baby unit of about 60 beds as well as outpatient clinics; preterm, neurodevelopmental, neurology, chest and general paediatrics.

At St. Francis hospital Nsambya, mothers are encouraged to donate human breast milk to be used to feed premature babies admitted in the NICU. For the past two years the hospital has been conducting activities to promote community awareness about the need for breast milk donation as part of the hospital plan to establish a Human Breast Milk Bank. Such activities included; community education through radio, television talk shows, charity walks during celebrations to mark the world prematurity days, health education talks in ANC, immunisation and postnatal wards.

Study population

Postnatal mothers 18 years and above in post-natal wards and department of Paediatrics, St Francis Hospital- Nsambya.

Inclusion criteria: All postnatal mothers above 18 year of age attending postnatal care, immunizations, and department of paediatrics or referred from other health facilities to St. Francis Hospital Nsambya during the study period who consented.

Exclusion criteria: Critically ill mothers who were not able to answer survey questions and those who lost their babies.

Sample size determination

Sample size for quantitative Phase : The sample size for this study was 410 postnatal mothers calculated based on Kish Leisle [12] using single population proportion formula with 95% confident

interval .The percentage, of breast milk donation acceptance among Nigerian women of 39.9% [13], with precision set at 5% was used and 10% non- response was estimated.

For the qualitative component of the study, a total of four Focus Group Discussions (FGDs) that consisted 30 study participants each with a minimum of seven and maximum of eight mothers as well as four key informant interviews were conducted with health workers involved in the care of preterm babies and mothers who had ever donated breastmilk .

Data collection methods and tools

The study begun with providing information about the research to postnatal mothers who were attending the postnatal clinic and department of paediatrics at St. Francis Hospital Nsambya. Those who were willing to participate in the study were then requested to go through a screening process. The research assistant obtained informed consent for mothers who met the inclusion criteria. This was followed by collecting data on socio-demographic characteristics, health service characteristics, and socio-cultural factors using a pretested, interview questionnaire that also contained questions on acceptance to donate breast milk.

For the qualitative data the composition of the FGDs was based on the quantitative findings where mothers who had attended OPD were more likely to accept breast milk donation. Thus we conducted 2 FGDs each for mothers receiving in-patient services (NICU and Baby Unit), and mothers receiving outpatient services (recruited from postnatal care, Immunization and paediatric clinic). The FGDs lasted 1- 2 hours. The key informant interviews were purposively selected based their knowledge and experience of human breast milk donation.. The study team introduced themselves and explained the purpose of the study and obtained written consent from all participants. Trained qualitative researcher moderated the discussions while the principal investigator audio recorded the proceedings and took notes.

Data quality

A structured interview questionnaire was developed in English and translated into the Luganda and back translated into English to ensure consistency. The questionnaire was pretested on 5% of the total sample size at the study site. This data was not included in the final analysis. Data was collected by trained Research Assistants. A two-day intensive training was held for all research assistants on the content, objectives, data collection tools and how to interview the study subjects. At the end of each working day, the principal investigator and research assistants reviewed the collected data for accuracy and completeness.

For qualitative data collection, interviews were undertaken in either Luganda or English language using a semi-structured interview guide. The interviews were conducted in a well-lit, private room that was located in the paediatric outpatient department. A semi-structured interview guide contained questions selected based on review of the literature. The interview guides contained open response format questions that enabled probing to clarify responses. The FGDs and KIIs were facilitated by the study team that was

trained in qualitative research methods. To ensure standardization, all questions on the guide were asked. All interviews and discussions were audio recorded and transcribed by two independent research assistants fluent in both languages. Those done in Luganda, transcripts were later translated to English.

Data analysis

Data was captured in EpiInfo database and exported into STATA version 13.0 software (STATA Corporation, Houston, Texas) for analysis. Statistical analysis was done using a three stage method i.e. uni-variate, bivariate and multivariate respectively. In the uni-variate analysis continuous variables were summarized using means and standard deviation and categorical variables were summarized using frequencies and proportions. In the bivariate analysis, the chi-square tests were used to examine the relationships between the independent variables and dependent variables. Factors associated with a p-value of <0.05 were considered to be statistically significant. All factors with a p-value of 0.25 were taken to multivariate logistic regression analysis. Multivariate logistic regression analysis was used to determine the adjusted odds ratio and factors associated with acceptance to donate human breast milk for banking. We considered the backward stepwise elimination in the multivariate logistic regression analysis to identify factors associated with acceptance at a p-value <0.05.

For qualitative, recorded data were transcribed verbatim by a qualitative research assistant. A second independent research assistant also transcribed and translated the transcripts to ensure validity. Both transcriptions were compared for discrepancies. The transcriptions were analysed and coded by using content thematic approach[14], taking into account both manifest and latent content to determine themes and sub-themes of acceptability for donating breast milk. The PI and another qualitative researcher coded the transcriptions independently to enhance consistency. The researcher and the supervisors jointly compared and finalized the themes and labelled them. The analysis draws on a theoretical framework of acceptability of health care interventions [15]. The key constructs of the frame work are 1) affective attitude (how an individual feels about the intervention), 2) burden (perceived effort required to participate in the intervention), 3) ethicality (intervention's goodness of fit with individual's value system), 4) intervention coherence (participant's understanding of how intervention works), 5) opportunity costs (benefits, profits and values to be given up to engage in the intervention), 6) perceived effectiveness (perception that intervention has achieved purpose), and 7) self-efficacy (participant's confidence that they can perform the intervention) [15]. Perspectives of mothers were triangulated with those of health care workers. Selected quotations from study participants have been used in the presentation of study results.

Study variables

Dependent variable*:* Acceptance to donate of Human breast milk for banking

Independent variables: Postnatal mother factors, Socio-cultural Factors of postnatal mothers

Mediating variables: Health system factors

Operational definitions:

Acceptance of human breast milk donation: Refers to mother's willingness to donate breast milk for banking [16]

Human Breast Milk Banking (HBMB): Refers to services which collect, screen, process, and dispense breast milk to hospitals or recipients [17].

Awareness of mothers about donor human breast milk banking: A mother was considered aware about donor breast milk banking if she had ever heard about donor milk banking [18].

Human breast milk donation: Refers to the act of a lactating mother giving breast milk for human breast milk banking [18].

Wet-nurse: Refers to a mother who breastfeeds another woman's baby [19].

The postnatal period: Refers to the first six weeks after child birth [16]

The postnatal mother: Refers to a mother who had given birth to a baby with in the last six weeks [16].

Results

Socio-demographic and maternal characteristics of the participants

The study was conducted from October 2018 to March 2019, we studied 410 postnatal mothers. Their median age was 29 years (IQR: 26-32), of these; 68.8% their age ranged between 25-34 years and 15.1% were 35 years or older. Majority (62.4%) of the respondents were university graduates, 75.6% of the women were employed and 86.6% of them had attended at least four ANC visits. During their previous pregnancy, 54.6% of the respondents had attended only one PNC visit and the remaining had attended two or more PNC visits. (Table 1)

Acceptance to donate human breast milk

Of the 410 postnatal mothers interviewed, 77.6% (95% CI:73.5%-81.6%) were willing to donate breast milk, the most common reason to donate was if they have excess breast milk (66%).While 63% were willing to donate to help infant in need and 55% to support another mother those lack breast milk(Figure.1). On preference to donate breast milk, 58.1% of the respondents preferred donation to a relative, while on receiving donated breast milk, 94.6% of the respondents did not restrict to a relative. (Table. 2)

Reasons for accepting to donate breast milk

The commonest reasons for accepting to donate among postnatal mothers were having excess breast milk followed by helping infants in need and support mothers who lacked breast milk (Figure 1).While fear of disease transmission, anxiety around safety, genetic mixing, were the major reasons for not accepting to use donated breast milk, others preferred not to donate, non-supportive environments, cultural and religious issues (Table 2).

Acceptance to use donated human breast milk

When asked about the acceptance to use donated breast milk, of the 410 mothers interviewed 69.4% were willing to use and 31.5% were not willing to use donated breast milk. Among those who were willing to use donated breast milk 65.0% said it was because breast milk is the best food for infants, followed by breast milk is better for growth by 62.0%, and 22.0% of them was because breast milk prevents diseases. (Figure 2) Of the 129 (31.5%) mothers who were not willing to use donated breast milk, the most common reason to decline was fear for disease transmission 61.2% , a perception that donated milk is unhygienic (36.4%) and it was not accepted culturally (3.1%) (Table 2).

Participant’s awareness of human breast milk donation

On the awareness about the wet-nursing, 79.3% of the respondents had ever heard about wet-nursing and 50.2% of the respondents were aware of breast milk banking. 87.1% of mothers in the study had never breastfed another person’s child. 89.0% agreed that collecting and storing breast milk was useful. 68.3% of the respondents had ever visited under 5 OPD ward.

Factors associated with acceptance to donate human breast milk at St. Francis hospital Nsambya

At bivariate analysis acceptance to donate breast milk was affected by women's level of education. Women who were graduates had an OR of 1.94(95% CI 1.22 -3.11) times most likely to accept breast milk donation compared to non-graduates (p-value of 0.006). Acceptance to donate human breast milk was also affected by the level of education of women’s husbands, women who had graduate husbands being 1.8(95%CI: 1.09-3.00) times more likely to accept to donate breast milk (p-value of 0.023). Women who had heard about wet-nursing were 2(95%CI: 1.18-3.40) times more likely to accept breast milk donation compared to those who had not heard about wet-nursing (p-value of 0.010). Whereas women who believed that collecting and storing breast milk was useful were 6.28(95%CI: 3.15-12.52) times more likely to accept breast milk donation (p value <0.001) (Table 3).

At multivariate analysis having ever visited the under-five OPD 21.29 (2.30 - 196.9) p=0.007, heard about wet-nursing 2.33 (1.10 - 4.96), p=0.028 and being one who perceived collecting and storing breast milk useful 7.51 (3.01 - 18.68), p<0.001, were independently associated with accepting to donate breast milk (Table 4).

Qualitative Results:

Most postnatal mothers in the qualitative component of the study were aged 25-34 years, more than a half of the mothers had attained tertiary education and almost all of them were employed see (Table 5).

Summary of quantitative results

The qualitative data explored reasons for acceptance to donate breast milk. And the results are presented using a Theoretical Framework of Acceptability of health interventions [15] and ends with recommendations from participants.(Table 6).

ENABLERS OF BREAST MILK DONATION

Breast milk best food/no substitutes

It was agreed among the FGD participants and KIIs that there was no substitute for breast milk for a new born baby whether preterm or full term. They noted that mothers who didn't breast feed their babies were denying them the best quality food and that it would interfere with the proper development of their children. As one of the mothers stated

"*Breast milk is well balanced with all nutrients whatever the mother eats the baby will get it through breast feeding." (**R1/FGD2, 31 years old, a mother of 3 children).***

While another mother described breast milk as irreplaceable:

*"However expensive the formula can be it is not a replacement to breast milk. Breast milk is very important to baby"**.(R6/FGD1, a 25 years old who is first time mother).***

A health professional also disagreed with the idea of mothers introducing formula milk to their new born babies as this could harm their babies. She considered formula milk as a risk to new-borns especially preterm babies as it may expose them to health complications

"**…Nothing else other than breast milk their intestines can't digest what you are giving them. So they will swell the tummies once you give them formulas." **(KII1 NICU nurse, a mother and frequent breast milk donor at st. Francis Hospital Nsambya).

Self-relief from pain or congestion

Some participants also considered breast milk donation as a way of reducing congestion of breast milk. They looked at it as a relief for the mother who is experiencing painful breasts due to milk engorgement.

"I can donate if I have enough to avoid the pain and swelling of the chest" ***(R5/FGD2, 25years old mother of 3 children).***

"*Most people have much milk like me I have excess and wet my blouses … so I will donate*" ***(R3/FGD2, 25 year old first time mother).***

While some mothers looked at it as a way of regulating breast milk flow to avoid chocking for their own babies especially for the mothers who have a lot of breast milk

"*You would be breast feeding your baby and then you see the milk choking him/her that shows you that you have excess so to reduce it is better option when you donate to needy preterm*". (***R1/FGD2, a 31 year old mother of 3 children).***

Will rather donate breast milk than flash it out

Most of the participant's demonstrated a confidence that they could donate if they have excess, especially due to the fact that the pre-terms are not likely to survive without breast milk. They considered breast milk donation as an act of kindness and a sacrifice to save a life.

*"Really when I have excess and there is another mother who doesn't have I would rather donate it to them than to flash it out. And some can't even afford to buy the formula so there is need to really donate this milk to the needy mothers and pre-terms"****(R5/FGD4, a 30 years old mother of 3 children).***

Some participants attributed the willingness to donate breast milk to having a humane and motherly spirit and understanding that anyone can be in need anytime

"If you have a motherly spirit you will donate because these things are like this today with another person tomorrow it will be you crying and looking for a donor to bless your child. So it is good to donate and I think majority women will be willing to donate" ***(R6/FGD4, 28 years old mother of 3 children).***

Seeing children grow on another woman's milk *(wet-nursing)*

Most women who had seen babies wet nursed grow well or had heard about wet-nursing were willing to donate breast milk as one of the participants explained:

*"I had my friend and her sister went abroad for greener pastures, she left a baby at 2 months and her sister used to breast feed two babies and they grew as if they were twins and they are 3 years…Wet nursing should be stopped completely and we resort to breast milk donation because the mother will have been tested very well at the hospital by the doctors." (****R2/FGD3, 28 years old first time mother).***

Emerging from the above narrative is the appreciation that breast milk donation can help to overcome the limitations of wet nursing mainly the spread of infections and diseases to the baby.

*"I think wet nursing is not good the world has changed and many ladies are sick with HIV and other diseases. It is not good it is better to donate because it is safe they test the donors and breast milk is kept safely."****(R4/FGD1, 23year old, first time mother).***

Positive experience with donated breast milk

A few of the mothers had used donated breast milk and described how breast milk donation worked for babies, as one of them narrated.

"I have gone through a lot myself as a mother of a preterm when they told me to express milk but I totally had nothing until a nursing sister helped me. So I will be willing to help another mother I have learnt the hard way…I later saw my baby responding so well and looking better every other day until I got my own breast milk. So I can be willing to donate having learnt that helping is good and nothing bad another person's breast milk can do to your baby once tested. ***(R4/FGD3, a 28-year-old first time mother).***

While other participants believe that children grow healthy and develop immunity through breast milk as a mother explained:

"Children grow healthy, children gain resistance to diseases when they breast feed there is good immunity for the breast fed baby". ***(R1/FGD3, 34 years old mother).***

Another mother also related children's education performance to breast milk where she said:

"I think the babies should breast feed because the human milk is good and they tell us that we should breast feed our babies well. I have 4 kids they are looking so healthy because of breast feeding and are brilliant in class". ***(R8/FGD3, 33 year old mother of 4 children).***

Breast milk saves lives, especially of premature

A great number of respondents considered breast milk donation as an act of saving the lives of the prematures. They all agreed that the greatest motivation for them to donate breast milk was because they knew that they were saving a life as these preterm babies could only survive on breast milk as a 26-year-old first time mother said:

"*…So you need to be determined to do it [breast milk donation] and save a life*."

A staff and a mother also described the importance of breast milk and by seeing the vulnerable babies you will need to do good saying:

*"But after learning about the superiority of breast milk over the formula then you get a heart to help someone who lacks, to save a life".****(KII2, a doctor at st. Francis Hospital Nsambya and a mother who ever donated).***

Another health care professional stated that by breastmilk donation pre-terms can survive and they cannot tolerate formula.

"I am a mother so seeing someone's babies die and also a healthy worker taking care of those babies I knew what could help those babies to survive. I knew what they could feed on and survive once such

preterm babies are put on formula milk they will die".***(KII1 NICU nurse , a mother and frequent breast milk donor at st. Francis Hospital Nsambya).***

Barriers to breast milk donation

The most common barriers to accept breast milk donation among participants were fear of: not having time, breast milk may not be enough for own baby, loss of body image, fear to test for HIV and know ones HIV status, and negative social cultural beliefs.

Mother may not have time to donate

Participants agreed that though most of them would be willing to donate, they were afraid that they may not have the time to come to the hospital to do it because of competing responsibilities. Others wondered if there would be mechanisms for collecting donated breast milk from home to relieve the donors the time of moving to the hospital.

"*Some will be willing to donate but time. Some mothers are too busy to come to hospital to donate".* ***(R6/FGD2, a 25 years old of 3 children****).*

Some participants who are working suggested that it would be time saving if the milk could be collected from their places of work

"*To add on that we working mothers we have no time you tend to forget your baby*".(***R4/FGD1, 23 year old first time mother).***

Fear the milk may not be enough for own baby

Some of the participants were afraid of not having enough breast milk for their own babies if they decided to donate. They looked at this as depriving their own babies at the expense of those who needed the milk as one mother noted.

*"You might donate and then you end up lacking enough for your baby. There was a time I wanted to donate for a lady in ICU and before a short while something came up and stressed me and pressure short up and my breast milk disappeared for a whole day and a half …So for me I have that worry as you can donate but fail to produce enough for your baby"****(R3/FGD1, a 33 year old mother with 3 children).***

May lead distorted body image /breast sagging

The worry of women losing their body image as a result of donating breast milk was mentioned in all the four group discussions. The participants feared that pressing or pumping their breasts to produce milk would cause their breasts to sag and their bodies to lose shape yet this was a big concern to most women.

"*Some people will wonder how they can breast feed their babies as well donate, will they fear to lose weight and be bum less and breasts grow floppy. So it might not work well."****(R2/FGD2 a 19 years old first time mother).***

Other participants further noted that sagging breasts was not only a concern for the women but for their husbands as well as most men prefer to have women with firm breasts.

*"Our spouses also don't like floppy boobs (breasts) they keep looking for young shooting boobs. That is why women breast feed for a short while and then put them on the formula due to the demands of men."(****R7/FGD1,23 year old a mother of 2 children).***

Some study participants argued that having a breast milk bank will be a means for women to escape breast feeding and opt to buy milk just to keep their breasts firm

*"…While other say women will totally stop breast feeding their children totally in the guise that there is free breast milk in the breast milk bank, they can buy or follow all procedures to get it. That they would rather keep their boobs looking good and nice than breast feeding babies and they look old."(****R2/FGD2, 19 years old first time mother).***

Implied in the above narrative is potential for likely misuse of donated breast milk and requires strict guidelines to attain the intended goal.

Fear to test for HIV and know ones sero-status/fear to transmit infections

One of the greatest fears that all the participants mentioned was the fear for testing or being tested for HIV before breast milk donation. This was a concern that potential donors would be afraid of being tested for HIV since it is a requirement for one to donate

"*Most young mothers don't like to test and know their sero-statuses. Instead they worry much and say they will also spread to the rest or kill themselves once they are told they have HIV.*" ***(R5/FGD1, a 26 year old a donor and mother with 1 child).***

Another participant also noted

"*People don't want to go for check- ups to know their HIV status that will hinder very many mothers from donating breast milk. And I feel if they were just taking breast milk without checkups the lines would have been very lon****g" .(R6FGD2, 25 years old of 3 children).***

Negative Cultural beliefs

Cultural beliefs and myths about breast milk donation were cited as one of the hindrances

Some of the participants noted that women will be suspicious about where exactly they are taking their breast milk and ill-intentioned people may harm the donor through breast milk donation

"*Like some will be asking now they are asking for my breast milk and they take it where or do what with it?* ***(R5/FGD4, a 30 years old mother of 3 children).***

The fears and cultural beliefs were compounded by the limited information about breast milk donation.

"They will be conservative. It is something they have never heard of, they will think they are going to kill women or make them never to produce children. That kind of stuff is likely to come up as a fear from the traditional leaders. That kind of fear will be put in women and they will fear to donate milk" ***(R5/FGD4, a 30 years old mother of 3 children).***

Health care workers also mentioned that some mothers may fear transmission of criminality such as theft, murder as well as mental illnesses through the breast milk as one of them explained:

*"There are some genetic issues everything is to do with a DNA thing. Some people fear their babies to feed on the breasts of thieves, murderers, mentally disturbed people and the like, that their children will end up like that. Then another thing as Africans we respect totems, in Ankole there is a clan where by their wives can't breast feed another person's baby because if you do it the child will die. In Buganda I hear you don't eat or move close to the clans or totems."****(KII1 NICU nurse, a mother and frequent breast milk Donor at st. Francis Hospital Nsambya).***

Partner/Spouse refusal

The other critical aspect that was brought up through the discussions was partner refusal for mothers to donate breast milk for banking. Most women believed that their spouses would not agree to it. Some actually shared their experiences where their spouses refused them from donating as noted;

"*Mine was good and supported me but others refuse their wives to donate their babies' milk, it will be reduced and it is not enough for their baby"* ***(KII4, frequent donor and staff at Nsambya hospital).***

Another one added:

*"One time my hubby asked me, don't you think you are depleting for our baby. And I would tell him let us share. He was hesitant first but later had to allow me. But then another friend of mine the husband refused her to give his son's milk" (****Mother of one, and a frequent donor at Nsambya hospital).***

However, it was noted that for some of the participants their spouses were supportive of the idea of breast milk donation which had been a great motivation for them.

"My husband was good and supported me to donate breast milk to those who were in need of it" ***(KII4, frequent breast milk donor at Nsambya hospital).***

Suggestions to improve accepting to donate

Throughout the discussions and interactions with the participants, a number of suggestions were made on how to overcome the barriers and get women to donate breast milk to those who are in need.

Saving time for the donors by collecting breast milk from home or work place

Throughout the discussions the aspect of time was very critical as most participants wondered where they would get the time to keep going to donate breast milk since most of the potential donors are working and have other obligations to fulfil. Participants expressed the need for people to collect the milk from their homes or places of work

"How I wish there will be some people who will keep passing through to collect donated breast milk from the willing mothers. I think people should endeavor to find us at our places of work or homes" ***(R6/FGD2, a 25 years old mother of 3 children).***

Doctors to asses those suitable to donate

The participants felt that the health workers had an important role to play in getting mothers accept to donate breast milk. They noted that health professionals were better placed to explain to the potential donors the importance of donating breast milk and to get the women to participate. They also felt that the health professionals needed to use their expertise to assess those who qualify to donate and those who don't as one of the participants noted

"*So doctors need to assess well whether the mothers have enough for their babies and then donate like they do during blood donation."****(R3/FGD1, a 33 year old mother with 3 child).***

Screening breast milk donors for infections

Participants noted that some mothers may refuse the donated milk for fear of passing on infections to their children. They suggested thorough screening of the milk so that the mothers of the pre-terms can have confidence to give their babies that milk

"But I request the doctors to test so well, the donors to see that the milk is so free from any diseases. HIV has an incubation process how shall we know that the milk is so free from HIV. Let us know within what duration should a lady be tested again? Because at any time one can acquire a disease. So I pray and request that the milk is well scrutinized before it is taken to the bank to save the lives of the preterm" ***(R2/FGD3, 28 year old mother).***

Community Education about breast milk donation

Participants noted that many people are not aware of the possibility of breast milk donation. People have many beliefs about it yet there are thousands of potential breast milk donors. They further noted that when people are sensitized about the importance of breast milk donation, they will do it

*"I think ladies should be taught about it and they will be willing to donate it is about awareness creation. They need to know that some mothers lack breast milk or some preterm have lost their mothers. When they learn and see what happens in the NICU then they will be kind to donate."**(R6/FGD2, 25 years old mother of 3 children).***

"*Awareness creation is very important to these ladies now like my other baby I had a lot of breast milk and I would just waste it I didn't know that some people look for breast milk for their preterm when they don't have. I could leave it to pour so that it reduces had I known I would have come and donate"**(R5/FGD4, a 30 years old mother of 3 children).***

Involvement of community leaders

It was noted from the discussions that involvement of community leaders and the elderly people would facilitate the acceptance of breast milk donation. Participants noted that if the community leaders and elders understood the idea and its importance, they will influence the women to do it. Some participants noted that community leaders/elders were not conversant with formula feeds; they knew breast milk and its importance. These were considered to be facilitators if sensitized.

*"Some might be young and might not understand these issues well, but traditional leaders I think will encourage us to donate some breast milk. They know the values of breast milk and always encourage us to breast feed our babies longer. So I feel what they need is sensitization and have information about donation. They will support the idea". **(R8/FGD1, 23 years old, a mother of 5 children).***

*"…we need to train the traditional and community leaders about breast milk donation. What they know most of is wet nursing, so we need to sensitize them and de-campaign that exercise of another mother breast feeding another's baby and promote donation of breast milk." **(R4/FGD1, 23year old first time mother).***

One of the participants shared her experience on the role of her grandmother during her experience with a premature

*"I think the community leaders will buy the idea because traditional leaders know less of formulas, so they know that breast feeding is on point for babies. I had a premature baby at 7 months and I had no milk. They called my granny and they told her about it she told them that they should call my aunt and she gets tested and she helps me to get breast milk for my baby."**(R2/FGD1, 29 year old, mother of 2 children).***

Discussion

Our study sought to determine the level of acceptance to donate breast milk and also assessed factors associated with mothers' acceptance to donate human breast milk. Over three quarters of mothers were willing to donate breast milk. Hence the acceptance to donate human breast milk was high. This high level of acceptance correlated with the positive perception of breast milk as useful, awareness about wet-

nursing and visiting under five OPD. This could be because mothers at the hospital had been exposed to breast milk donation. In the past five years, the neonatal unit at St. Francis Hospital Nsambya has improvised pairing mothers who are breastfeeding with mothers who have very low birth weight preterm babies as breast milk donors. In line with promoting breast milk donation for babies in need and laying ground for the establishment of the breast milk bank. Similar studies that found high acceptance rate were Turkey (64%) and India (84.9%)[20, 21]. Similar to India and Turkey, the study results are most likely influenced by the availability of information about the need for breast milk bank in the care of premature babies shared through various forums.. Our results (77.6%) are better than those observed in Nigerian and Ethiopian studies in which acceptance was 11% and 39%[6, 9] respectively. The low levels of accepting to donate breast milk was linked to lack of awareness about breast milk banking and mother's fears and traditional myths associated with human milk banking that are prevalent in the community[13].

In this study, factors associated with the acceptance to donate breast milk were being positive towards breast milk expression and storage, knowledge and awareness about wet-nursing and visiting under five OPD.

Mothers who had knowledge and were aware about wet-nursing were 2.33 times more likely to donate breast milk when compared to mothers without wet-nursing knowledge and awareness. It is likely that the practice of wet-nursing exists in the communities and mothers with knowledge about this wet-nursing practice have an increased tendency to accept to donate breast milk to children in need. This was also supported by qualitative finding where mothers who had seen babies grow on other women's milk (wet-nursing) were supportive of breast milk donation. The experience with wet-nursing had increased women's confidence that they can perform the practice in line with what Sekhon describes as self-efficacy [15]. Similarly, mothers who heard about wet-nursing in Ethiopia were more likely AOR 4.2 (95% CI 2.5, 6.99) to accept breast milk donation [6]. In Brazil, it was also found that awareness about donor breast milk banking and wet-nursing were significantly associated with acceptance to donate breast milk for banking [7]. In our study, awareness of breast milk bank was not significant possibly because there is no breast milk bank in Uganda currently.

According to our study findings, mothers who visited the under-five OPD were 21(AOR 95%CI: 2.30–196.9) times more likely to accept to donate their breast milk. This is most likely that in our setting, information about breast feeding new-borns is mostly provided during antenatal, postnatal and at the under-five outpatient departments. Whereas our finding indicate a wide confidence interval, they are similar to those observed in Ethiopia in which mothers were twice as likely to donate their breast milk after visiting a children's ward [6]. Visiting units will expose mothers to knowledge about breastfeeding. It may be that as mothers receive information related to breastfeeding and the importance of breast milk to the infants their acceptance to donate breast milk increases.

In our study, mothers who thought collecting and storing breast milk was useful were 7.51 (95% CI: 3.012–18.681) times more likely to accept to donate their breast milk. This can be partly explained by the fact that working class mothers who practice expression of breast milk for their own babies have no

objection to donate their excess milk to another baby. This was comparable to a study conducted by in Brazil which showed that information about breast milk expression was significantly associated with human milk donation AOR 3.6 (95% CI of 1.48–8.9).[7].

In our study the commonest reasons for accepting to donate breast milk among postnatal mothers were having excess breast milk (66%), followed by helping infants (63%) in need and support mothers who lack breast milk (55%). This is supported by findings from the FGDs and KIIs where most of the participants were willing to donate especially due to the fact that the pre-terms are not likely to survive without breast milk, they considered breast milk donation as an act of kindness and a sacrifice to save a life. Most participants urged that there was no substitute for breast milk for a new born baby whether preterm or full term. They noted that mothers who didn't breast feed their babies were denying them of the best quality food and that it would interfere with the proper development of their children. Some of the mothers also considered breast milk donation as a way of reducing congestion of breast milk, they looked at it as a relief for the mother who is experiencing painful breasts due to milk engorgement. In line with [15] acceptability framework, our participants generally were positive about breast milk donation, felt it is feasible to undertake and is effective for new born care especially for premature.

The most common barrier to accept breast milk donation among participants were fears of not having enough milk, not having time for the donation process, stress affecting milk flow, fear to transmit diseases and knowing ones HIV status; loss of body image secondary to breast milk expression and donation. There were also negative cultural beliefs such as a belief that criminal behaviours and mental illness can be transmitted to the baby through breast milk if the donor happens to have such. Sekhon et al have stated that acceptability of healthcare interventions depends on the appropriateness of the intervention in terms of anticipated or experienced cognitive and emotional responses [15] they stated 7 constructs for Theoretical Frame work of Acceptability (TFAs)which include: affective attitude (how an individual feels about the intervention), burden (perceived effort required to participate in the intervention), ethicality (intervention's goodness of fit with individual's value system), intervention coherence (participant's understanding of how intervention works), opportunity costs (benefits, profits and values to be given up to engage in the intervention), perceived effectiveness (perception that intervention has achieved purpose), and self-efficacy (participant's confidence that they can perform the intervention). Our participants generally felt good about breast milk donation, but may be burdened by the time spent in the process of breast milk donation, this finding is not new, and has been reported in other study in Honkong [22] where mothers mentioned time as major obstacle to breast milk donation. Plans to start breast milk banks should incorporate strategies to ensure that the process of donating is devoid of delays. Some participants suggested to consider home and work place pick-up of breast milk. Most study participants were confident of the effectiveness of breast milk donation especially those who had donated before and those who had seen babies survive and grow on donated breast milk in line with the construct of perceived effectiveness in the acceptability framework [15]. Most mothers perceived breast milk to be effective in prevention of disease and improving Childs immunity, mental and physical development [23]. Mothers who had sufficient breast milk viewed donating excess milk as valuable to

save babies without breast milk. On the contrary, there was fear among most study participants that donating breast milk may deprive their own babies of adequate nutrition.

This requires awareness rising but also for health care workers to be involved in assessing and advising mothers suitable to donate. The concern that mothers may not be having enough milk for their own babies in order to donate, has also been raised in some studies [13, 22]. Our study revealed negative cultural beliefs such as criminal behaviours and illness can be transmitted to the baby through donated breast milk reflecting value conflict in acceptance to donate breast milk and require community education and dialogue to counter. In addition, some mothers were concerned that some male partners would not approve breast milk donation for fear that it would deprive their babies of adequate milk. This finding is not surprising given that men in many African settings are key decision makers on issues related to child and maternal health [24]. It is important that health care professionals target community leaders and male partners as key stakeholders in health education regarding breast milk donation and decision making.

5.3 Strength /Limitations

To our knowledge this is the first study to assess acceptability of breast milk donation in Uganda at the time when St. Francis Hospital Nsambya is planning to start a breast milk bank. The study had quantitative and qualitative components findings of which complemented each other in understanding acceptability of breast milk donation and factors at play. In the qualitative part we obtained data from mothers and health care workers and thus provided an opportunity for data triangulation which improved trustworthiness of our study findings. The study was conducted in a hospital which is a private non- for profit. Most postnatal mothers attending the hospital have better access to health education and income than ordinary Ugandans. Thus results may not be generalizable to other Ugandan settings. In addition, the high acceptability documented in our setting may be attributed to the exposure of mothers to breast milk donation which is a practice to feed very low birth weight preterm at St. Francis Hospital Nsambya using locally improvised methods. At the time of the study, St. Francis Hospital Nsambya was conducting community education in preparation to start a breast milk bank which is not the case in other Ugandan settings. Recall bias cannot be excluded in interview process however our study participants were those within 6 weeks from delivery which helped to minimise the effect of recall bias. This was a hospital based study thus views of mothers outside the hospital setting about breast milk donation may vary. We recommend community level studies involving all stake holders including community leaders, elders and spouses/partners.

Conclusion

The level of acceptance to donate human breast milk among mothers at St. Francis Hospital Nsambya is high (77.6%). Thus establishing a Human Breast Milk bank is feasible. Being positive to breast milk

expression and storage, awareness of wet-nursing and visit to an under five OPD were associated with acceptance of breast milk donation.

Breast milk was in general considered as the best food for infants especially premature babies. Key barriers to accepting breast milk donation were; fear of delays during breast milk donation, not having enough breast milk, spousal refusal and a belief that criminality and mental illness can be transmitted through donated breast milk. Making the process of donation quick, pick up services for donors, and community education and male partner engagement about breast milk donation could further increase acceptability of breast milk donation.

Declarations

Practical implication:

The information obtained will guide messages for the particular women in the postnatal wards. The stakeholders can use the information to setup a breast milk bank at St Francis Hospital Nsambya.

Ethics approval and consent to participate

Ethical approval was obtained from Nsambya Hospital research and ethics committee, and permission was also obtained from management of St Francis Hospital Nsambya. Consent to participate in the study was obtained from all study participants.

Consent for publication

Not applicable

Availability of data and material

The datasets generated during and/or analyzed are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

MAMA, conceived the study, collected data, analysed and wrote the first draft of the manuscript. NCP, Writing Review and editing. WLM, Analysis writing review and editing. NVK, Writing Review and editing

and RJ, writing review and editing. ALL authors provided substantial inputs to the initial draft of the manuscript, All authors have read and approved the final version of the manuscript.

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Tables

Table 1. Socio-demographic and maternal characteristics of the participants N=410

Variable	Freq	(%)
Age		
Mean(SD)	29 (4.93)	
Age groups		
< 25	66	16.1
25-34	282	68.8
35+ yrs	62	15.2
Level of Education		
Non-graduates	154	37.6
Graduates	256	62.4
Participant occupation		
Unemployed	100	24.4
Employed	310	75.6
Participant religion		
Christians	345	84.1
Muslim	65	15.9
Marital Status		
Unmarried	152	37.1
Married	258	62.9
Husband Education n=406		
Non-graduates	100	24.6
Graduates	306	75.4
Household monthly Income		
< 500,000	133	32.4
> 500,000	277	67.6
Number of pregnancies carried		
<1 pregnancy	118	28.8
1 + Pregnancies	292	71.2
Parity		

<=3	322	78.5
4+	88	21.5
ANC previous pregnancy		
Not applicable	159	38.8
<=3 ANC	23	5.6
4+ ANC	228	55.6
ANC last pregnancy(current baby)		
<=3 ANC	55	13.4
4+ ANCs	355	86.6
Participant has ever received breastfeeding counselling *n*=402		
No	128	31.8
Yes	274	68.1
PNC visit previous pregnancy		
Not pregnant	130	31.7
1 Visit	224	54.6
2+ visits	56	13.7

Table 2: Level of acceptance and reasons of donating human breast milk

Variable	Freq	(%)
Acceptance to donate breast milk n=410		
Yes	318	77.6
No	92	22.4
Acceptance to use donated Breast milk		
No	129	31.5
Yes	281	68.5
Reasons for accepting to use DHBM n=281		
Best food for infants	182	64.8
Breast milk better for growth	174	61.9
Breast milk prevents diseases	62	22.1
Help infant in need	20	7.1
Expensive formula milk	18	6.4
Reason for not accepting to use DHBM n=129		
Fear of disease transmission	79	61.2
Fear unhygienic milk	47	36.4
Idea not liked	44	34.1
Fear genetic mixing	18	14.0
Spouse/family not supportive	9	7.0
Not accepted culturally	4	3.1
Religious issues	2	1.6
Infant formula preference	2	1.6
Preference to donate breast milk		
Not relative	172	42.0
Relative	238	58.1
Preference to receive breast milk		
Not relative	388	94.6
Relative	22	5.4

Table 3: Factors associated with acceptance to donate human breast milk at St. Francis hospital Nsambya.

	Acceptance to donate		Bivariate	
Participant Characteristics	**No number(%age)**	**Yes number(%age)**	**cOR(95% CI)**	**p-value**
Age groups<25	14 (15.2)	52 (16.4)	1	
25-34	63 (68.5)	219 (68.9)	0.94 (0.49-1.80)	0.842
35+ yrs	15 (16.3)	47 (14.8)	0.84 (0.368-1.93)	0.687
Level of Education				
Non-graduates	46 (50)	108 (34)	1	
Graduates	46 (50)	210 (66)	1.94 (1.21-3.11)	0.006
Marital Status				
Unmarried	29 (31.5)	123 (38.7)	1	
Married	63 (68.5)	195 (61.3)	0.73 (0.45-1.20)	0.212
Husband Education				
Non-graduates	31 (33.7)	69 (22)	1	
Graduates	61 (66.3)	245 (78)	1.8 (1.09-3.00)	0.023
Parity				
<=3	70 (76.1)	252 (79.3)	1	
4+	22 (23.9)	66 (20.7)	0.78 (0.46-1.33)	0.364
ANC current pregnancy				
<=3 ANC	15 (16.3)	40 (12.6)	1	
4+ ANCs	77 (83.7)	278 (87.4)	1.35 (0.71-2.58)	0.357
PNC visit after last pregnancy				
2+ visits	16 (17.4)	40 (12.6)	1	
1 Visit	52 (56.5)	172 (54.1)	2.42 (1.05 - 5.61)	0.038
Not pregnant	24 (26.1)	106 (33.3)	3.31 (1.38 - 7.95)	0.007

Ever visited under five OPD wards				
No	32 (36.8)	87 (30.2)	1	
Yes	55 (63.2)	201 (69.8)	1.34 (0.81-2.22)	0.249
Counselled on breast feeding at under-5 OPD				
No	31 (35.6)	90 (31)	1	
Yes	56 (64.4)	200 (69)	1.23 (0.74-2.04)	0.421
Experienced breast feeding difficulty				
No	69 (78.4)	247 (82.1)	1	
Yes	19 (21.6)	54 (17.9)	0.79 (0.44-1.43)	0.441
Acceptance to use donated Breast milk				
No	87 (94.6)	301 (94.7)	1	
Yes	5 (5.4)	17 (5.3)	0.98 (0.35-2.74)	0.973
Heard about wet-nursing				
No	28 (30.4)	57 (17.9)	1	
Yes	64 (69.6)	261 (82.1)	2 (1.18-3.40)	0.010
Human Breast Milk Banking				
No	52 (56.5)	152 (47.8)	1	
Yes	40 (43.5)	166 (52.2)	1.42 (0.89-2.27)	0.142
Have you ever breastfed another mother's child				
No	80 (87)	277 (87.1)	1	
Yes	3 (3.3)	22 (6.9)	2.12 (0.618-7.26)	0.232
Is collecting and storing breast milk useful				
No	23 (25)	16 (5)	1	
Yes	68 (74)	297 (93.4)	6.28 (3.15-12.52)	<0.001

Table 4: Factors associated with acceptance to donate human breast milk at St. Francis hospital Nsambya

Variable	Bivariate		Multivariate	
Age groups	**cOR(95% CI)**	**p-value**	**aOR(95% CI)**	**p-value**
< 25	1		1	
25-34	0.94 (0.49-1.80)	0.842	0.63 (0.22 - 1.82)	0.397
35+ yrs	0.84 (0.37-1.93)	0.687	0.44 (0.11 - 1.77)	0.250
Level of Education				
Non-graduates	1		1	
Graduates	1.94 (1.22-3.11)	0.006	1.30 (0.62 - 2.73)	0.482
Husband Education				
Non-graduates	1		1	
Graduates	1.8 (1.09-3.00)	0.023	1.35 (0.60 - 3.05)	0.463
Ever visited under five OPD wards				
No	1		1	
Yes	1.34 (0.81-2.22)	0.249	21.29 (2.30 - 196.9)	**0.007**
Heard about wet-nursing				
No	1		1	
Yes	2 (1.18-3.40)	0.010	2.33 (1.10 - 4.96)	**0.028**
Is collecting and storing breast milk useful				
No	1		1	
Yes	6.28 (3.15-12.52)	0.000	7.51 (3.01 - 18.68)	**<0.001**

Table 5: Characteristics of mothers in the FGDs and KII

Characteristics	Number
Age range (yrs)	
18- 24	6
25-34	24
35+ yrs	4
Education level	
Graduate	18
Non-graduate	16
Employment status	
Employed	26
Un-employed	8
Participant categories	
FGD at IPD	# mothers
First FGD	8
Second FGD	7
FGD at OPD	
First FGD	7
Second FGD	8
KII	4
KII- Key Informant Interviews, FGD-Focus Group Discussion, IPD-Inpatient Department, OPD Outpatient Department	

Table 6: A Summary of results from the acceptability to donate human breast milk study, reported using constructs

TFA construct	Definition	Findings(Sub theme)	Major theme	Suggestions
Affective attitude	Affective attitude implies how an individual feels about the intervention	Breast milk best food/no substitutes Breast Milk is irreplaceable Self-relief from pain or congestion	Enablers of breast milk donation	Build on the enablers to educate and sensitize people about breast milk donation
Self-efficacy	Participant's confidence that they can perform behaviour required by intervention	Will rather donate breast milk than flash it out		
Intervention Coherence	Extent to which the participant understands the intervention and how it works	*'I have seen babies wet nursed grow well'* Breast fed babies grow healthy Positive experience with donated breast milk		
Perceived effectiveness	Extent to which intervention is perceived to achieve its purpose	Breast milk saves lives/ especially of premature		
Burden	The perceived amount of effort required to participate in the intervention	May not have time to donate	Barriers of breast milk donation	Process of breast milk donation should be quick Consider pick up services from home
Opportunity costs	Extent to which benefits, profits, or values must be given up to engage in the intervention	Fear the milk may not be enough for own baby May lead to distorted body image /breast sagging		Doctors to asses those suitable to donate Community education about breast milk

		Fear to test for HIV and know ones sero-status Fear to transmit infections	donation to address those fears.
Ethicality	Extent to which the intervention has good fit with an individual's value system	Negative socio-cultural beliefs (a belief that criminality and mental illness can be transmitted through donated breast milk & fear that mother can be harmed through donated breast milk) Partner/spouse refusal	Provide health education & counselling Involvement of male partner in education and decision making in breast milk donation

Figures

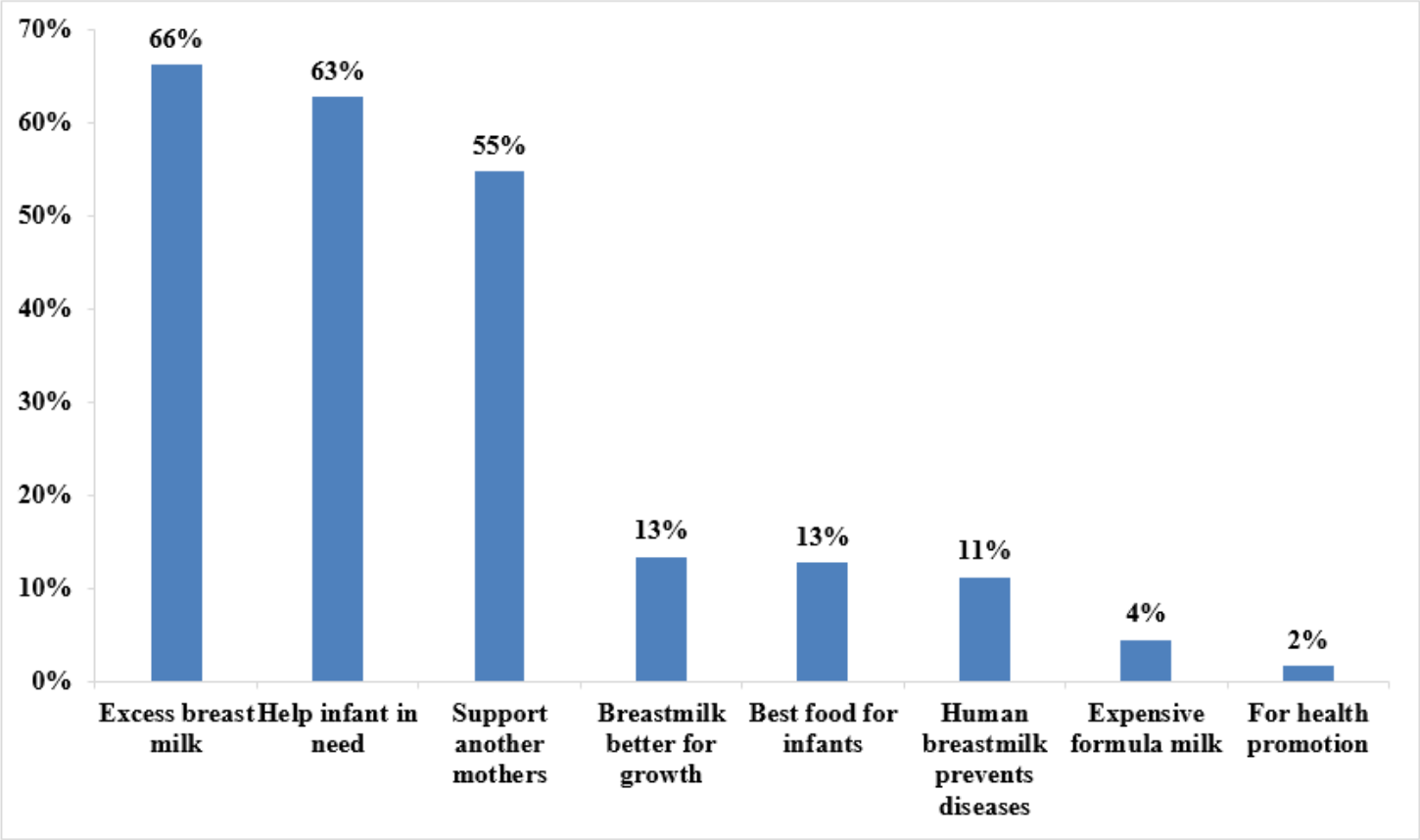

Figure 1

Reason for accepting to donate breast milk

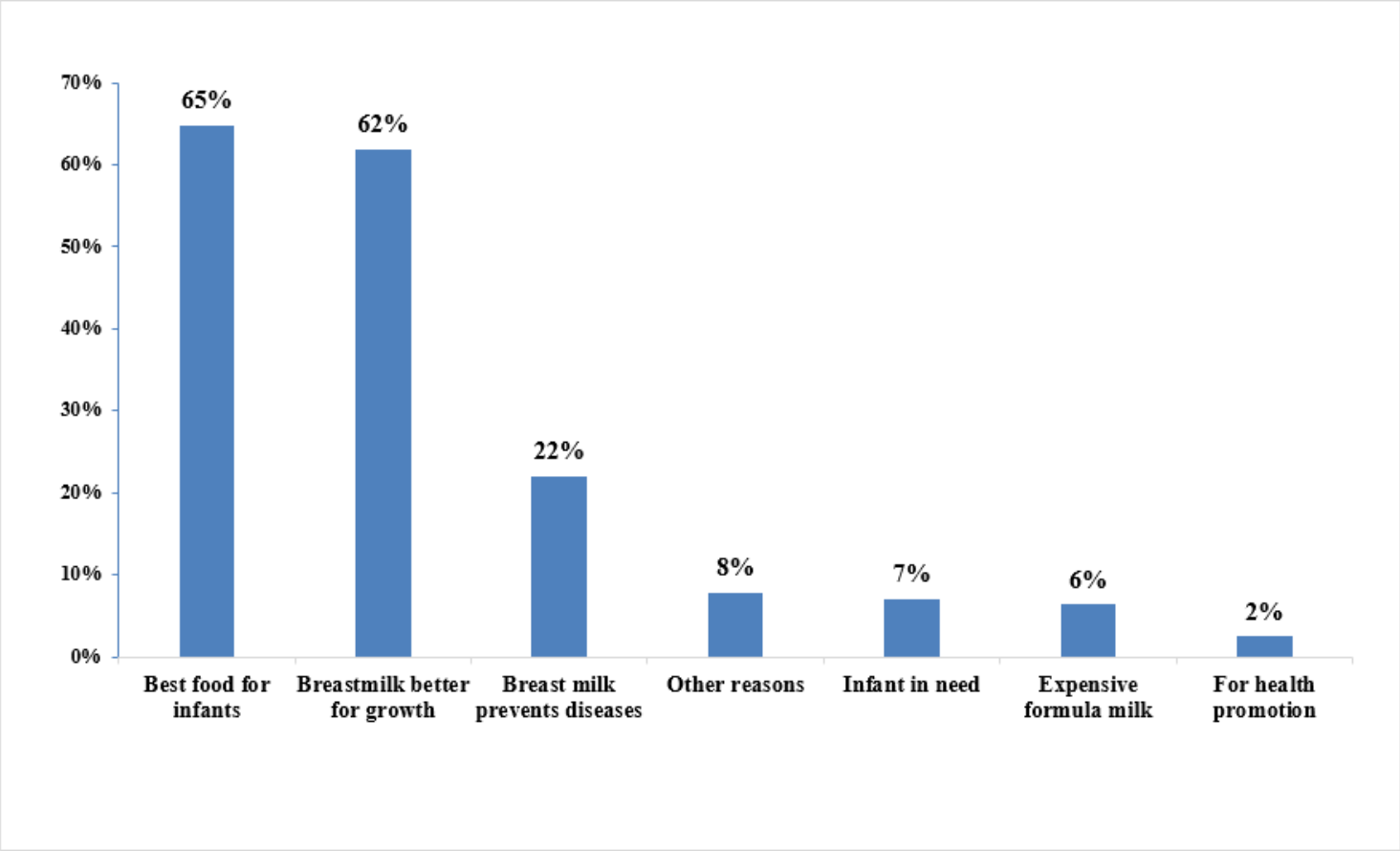

Figure 2

Reasons for accepting to use donated breast milk