

Women's Knowledge and Attitudes on Established Breastmilk Bank in Limpopo Province, South Africa

Mahlatjie Mantji¹, Bopape Makoma¹ & Mothiba Tebogo²

¹School of Health Care Sciences, Department of Human Nutrition and Dietetics, University of Limpopo, South Africa

²Faculty of Health Science, Deans Office, University of Limpopo, South Africa

Correspondence: Mantji A Mahlatjie, Department of Human Nutrition and Dietetics, University of Limpopo, Private Bag X1106, Sovenga 0727, South Africa. Tel: 27-15-268-3376; Fax: 27-15-268-3256. E-mail: mantji.mahlatjie@ul.ac.za

Received: April 13, 2019 Accepted: May 30, 2019 Online Published: July 21, 2019

doi:10.5539/gjhs.v11n9p93 URL: <https://doi.org/10.5539/gjhs.v11n9p93>

Abstract

Background: Breastfeeding is recommended as the best practice which results in normal growth and development of the healthy infants. In cases where the mother is unable to provide adequate breastmilk due to unavoidable circumstances, pasteurised donated breastmilk from the bank should be considered for hospitalized or preterm babies.

Objectives: To explore and describe women's knowledge and attitudes related to established breastmilk bank in Mankweng area.

Methods: An explorative descriptive contextual qualitative research was conducted. Data was collected using semi-structured, one-on-one interviews at the rural hospital and a rural clinic in Limpopo province. Purposive sampling method was used to select participants of this study. Adherence to criteria for trustworthiness was aimed at ensuring that the findings become credible, transferable, confirmable and dependable. Ethical standards were adhered to in order to protect identity, dignity, rights and welfare of the study participants. Data was analysed using Tesch's open coding method.

Findings: Women at the hospital have knowledge related to breastmilk bank whilst the ones at the clinic have insufficient knowledge about breastmilk bank. The participants have shown positive attitudes towards donating breastmilk to the bank, whilst on the other hand negative attitudes towards receiving donated breastmilk from the bank were identified due to fears of contracting infections mainly HIV.

Conclusion: Women at the clinic, have insufficient knowledge and negative attitudes towards the established breastmilk bank. However, they were more willing to donate rather than to accept donated human milk from the bank. On the other hand, women at the hospital are knowledgeable about the breastmilk bank and they revealed positive attitudes towards the established breastmilk bank. It is recommended that the established breastmilk bank should be well promoted and well publicised to the community members in order to utilise the bank effectively and efficiently.

Keywords: attitudes, breastmilk, breastmilk bank, donation, knowledge, women

1. Introduction and Background

The World Health Organisation (WHO) recommends initiation of breastfeeding within one hour of life, and exclusive breastfeeding for the first six months to protect the infant from acquiring infections and to reduce infant mortality (WHO/UNICEF, 2003). In addition, WHO recommends receiving donated milk from another mother as an alternative for babies who are unable to get milk from their own mothers. Breastmilk is the golden standard of infant nutrition because it provides powerful nutritional and immunological protection and decreases mortality due to infections (Goodfellow, Reimers, Israel-Ballard et al., 2016). Breastmilk is important for infant growth, development and overall health, especially for pre-term, low birth weight and other vulnerable infants (Coutsoudis, Adhikarri, Nair et al., 2011a). Studies indicate that breastmilk contains antibodies that help to protect infants from common childhood illnesses such as diarrhoea and pneumonia. It also contains anti-inflammatory and immune-modulatory properties that protect against some infectious diseases and immune-related diseases such as

Type 1 diabetes mellitus, late onset obesity, celiac disease and inflammatory bowel disease later in life (Horta & Victora, 2013a; Biasini, Stella, Malaigia et al., 2013).

According to South African Department of Health (SADoH) Infant and Young Child Feeding Policy mothers who are HIV infected should be supported and they should exclusively breastfeed their infants for six months, with addition of appropriate complementary feeding and continue to breastfeeding for 12 months whilst taking antiretroviral treatment as prescribed (SADoH, 2013). Breastfeeding has been constantly shown to reduce infant mortality and morbidity associated with infectious diseases in both resource rich and resource poor settings, particularly in the first month of life. In the low-income and middle –income countries, only 37% of the children younger than six (6) months of age are exclusively breastfed (Victora, Bahl, Barrois et al., 2016).

Despite the benefits of breastfeeding, there are however instances where mothers are unable to provide breastmilk to their babies, such as when a baby is in an intensive care unit, when a mother is unable to provide sufficient milk, or when the mother is deceased. Donated milk rather than formula milk becomes the best alternative in such circumstances (Simmer & Hartmann, 2009). Current evidence shows that there are some health advantages to preterm infants being fed pasteurised donor milk over preterm formula (Baker, 2017). Pasteurised donor human milk reduces the incidence of NEC four-fold and improves feeding tolerance, which may be associated with reduced days of parenteral nutrition and reduced hospital length of stay (Simmer & Hartmann, 2009).

The history of human breast milk donation can be outlined back in 1909 and the first human milk bank was established in Vienna (Kim & Unger, 2010). Worldwide countries are establishing human milk banks to collect, pasteurise and provide safe donated human milk to the vulnerable infants (Goodfellow et al., 2016). The WHO and the United Nations Children's Fund (UNICEF) have supported the establishment of human milk banking as part of the international efforts to promote, protect and support breastfeeding.

The National Department of Health South Africa (SADoH), in its consultative meeting together with all stakeholders including Minister of Health, Deputy Minister of Health, members of executive council, director generals, heads of departments, health managers and workers, experts, academics, traditional leaders and traditional health practitioners, non-governmental organisations, civil society, the United Nations Children's Fund (UNICEF) and the WHO on the 11th August 2011 adopted the Tshwane Declaration which committed to support and strengthen efforts to promote breastfeeding, to reduce neonatal and postnatal morbidity and mortality (SADoH, 2011). Milk banks have been set up within a hospital's neonatal unit and run by the neonatal unit staff in most Provinces to provide milk for infants whose mothers cannot breastfeed as per the Tshwane Declaration and IYCFP recommendations (SABR, 2017; UNICEF, 2011). In addition, South Africa (SA) is one of the countries where the most important main concern is the high infant, child and under-five mortality (SADHS, 2003). In response to the high mortality rate, SA has declared itself as a country that keenly promotes, protects and support exclusive breastfeeding (SADoH, 2011). In response to that, a breastmilk bank was established at Mankweng hospital, Limpopo Province and launched in July 2016 (SABR, 2017).

However, research conducted in other countries revealed that mothers were concerned about cultural beliefs, microbial safety, pasteurisation process, screening of donors, and practicalities about transportation and storage of the donated human milk banking (Gürol, Ozkan, & Celebioglo, 2013). Furthermore, another study conducted in Kwazulu-Natal, South Africa showed concerns from mothers about the safety of donated breastmilk, lack of familiarity with its use, and discomfort as well as sensitivity about using a bodily fluid from another mother, thus leading to mothers not accepting donated human milk (Coutsoudis, Petrites, & Coutsoudis., 2011b). Therefore, in light of the above, it was necessary to explore women's knowledge and attitudes towards the established breastmilk bank in the Mankweng area.

2. Methodology

A qualitative approach with exploratory descriptive study design was conducted. The design was appropriate for the study as the researchers aimed to explore and describe the knowledge and attitudes of women towards the established breastmilk bank in Mankweng area.

2.1 Study Site

The study was conducted in a rural tertiary hospital and a rural clinic in the Capricorn District, Limpopo Province of South Africa.

2.2 Population and Sampling

The study was conducted in a rural tertiary hospital and a rural clinic in the Capricorn District, Limpopo Province of South Africa. Participants at the clinic included women who were breastfeeding and women whose infants were

admitted at neonatal ward of Mankweng hospital. A non-probability purposive sampling method was used to select the participants, and the researcher reached saturation after interviewing 18 participants in both the hospital and the clinic.

2.3 Data Collection

Data was collected through one-on- one semi-structured interviews, using an interview guide in a private room that was provided by both institutions. The interviews were conducted in Sepedi and translated to English. The researcher voice recorded all the interviews and transcribed the interview verbatim. Participants were interviewed based on their willingness to participate in the study by signing consent forms voluntarily and permission was obtained in order to voice record the interviews. The researcher asked one central question, followed by probing questions on knowledge and attitudes of women regarding the established breastmilk bank.

2.4 Data Analysis

The eight (8) steps of Tesch's inductive, descriptive open coding technique was used for data analysis (Creswell, 2014). All interviews were recorded using a voice recorder and transcribed verbatim. The researcher read through transcripts to get the sense of the whole information. Similar topics were grouped together, asking questions about the meaning of the collected data, topics were abbreviated to codes, themes and sub-themes were developed from the coded data. The independent coder compared the results for duplication, initial grouping of all themes and sub-themes and some of the data was recoded.

2.5 Measures to Ensure Trustworthiness

To ensure the quality of the data and findings, the concepts of credibility, dependability, confirmability and transferability were used to describe the truth value of the study. The credibility in this study was ensured through prolonged engagement of the researcher with the participants during data collection. Dependability was ensured by sharing all supporting documents, such as the transcripts, field notes and voice recordings, with the peers who have extensive experience in qualitative research in order to reach consensus on the findings and recommendations of the study. In this study transferability was not possible, because the findings could not be generalised to all the public hospitals and clinics in the Limpopo Province, but were only limited to the Mankweng hospital and Mankweng clinic. Confirmability was ensured through the involvement of the independent coder who is an expert in qualitative research to confirm themes, voice recordings and field notes. The researcher ensured that personal values and beliefs did not influence the research findings.

2.6 Ethical Considerations

Ethical clearance was obtained from Turfloop Research Ethics Committee (TREC/36/2016:PG) of the University of Limpopo, as well as from the Limpopo Department of Health Research Committee and Chief Executive Officer of the participated hospital and operational manager of the clinic. Participants were accessed while they were queuing at the clinic, and at the hospital, they were accessed in their cubicles. They were briefed and informed about the purpose and significance of the study and they were allowed to make informed decision about their participation in the study. The purpose of using voice recorder and taking interview notes were explained to the participants before interview session. Participants who agreed to be part of the study signed a consent form before commencement of data collection. Participants were assured of their right to refuse to participate or to withdraw from the study at any stage if they wished.

The confidentiality of the participants was maintained as much as possible by ensuring that information obtained from the participants was not shared with anyone who was not part of the research team. Codes (WC = woman clinic, WH = woman hospital) were used instead of participant's real names during data collection to protect participants' responses. The interviews were conducted by the researcher in a private room offered by both the hospital and the clinic. Data protection was achieved by ensuring that voice recorder, transcribed verbatim and field notes were kept confidential in a locked cupboard in the researcher's office where no one will have access to except the researcher and the supervisors.

3. Findings

Characteristics of the Participants

Total number of participants in this study was 18 which included 56 % (n= 10) of women who were interviewed at the hospital, and 44% (n = 08) interviewed at the clinic. The majority 61% (n=11), of the participants were aged 25-35 years, while 22% (n = 4) were aged 18-24 years and 17% (n = 3) were aged 36 – 45 years. 78% (n = 14) were single, while 22% (n = 4) were married. Majority of the participants 61% (n=11) completed secondary education, while 39% (n =7) completed tertiary education.

The following three (3) themes reflected knowledge and attitudes of women towards an established breastmilk bank in narrative form describing positive and negative attitudes at a selected tertiary hospital and a rural clinic.

- **Knowledge of women related to breastmilk banks.**
- **Views of women related to having a breastmilk bank and the importance thereof.**
- **Acceptability of donated breastmilk among women.**

Theme 1: Knowledge of women related to breastmilk banks.

Women who were visiting at the clinic gave the impression not to have knowledge about breastmilk banks. Most of the participants mentioned that they had never heard anything about breastmilk banks, and they did not know that there is an established bank in the area.

This was confirmed by the interviewed women at the clinic who said:

"No I don't understand when you say breastmilk bank, I am lost, it is for the first time I hear about it, to be honest I have never heard anything about breastmilk bank, I don't know anything about it" (WC06).

Another interviewed woman at the clinic reiterated:

"Is there a breastmilk bank at Mankweng hospital? I have never heard about it, and I don't even understand when you talk about breastmilk bank (WC02)".

However, women who were interviewed at the hospital were knowledgeable about breastmilk bank. This group of participants were actively involved in the bank as some of them were already donating to the bank while other infants were receiving donated milk from the bank.

Woman at the hospital said:

"About breastmilk bank, I know that breastmilk bank is a place where mothers donate their breastmilk and it is available here at the hospital. When we started, they first ask consent from us before we donate breastmilk. The main aim of the bank is to help babies without mothers and mothers that are critically ill who cannot breastfeed their babies" (WH01).

Another woman at the hospital said:

"The breastmilk bank is available here at the hospital and it is very important because it helps babies whose mothers are unable to breastfeed their babies and it is much appreciated" (WH02).

Theme 2: Views of women related to having a breastmilk bank and the importance thereof.

Participants viewed breastmilk as something valuable, and very important which will save other infant's lives. The findings revealed that participants perceived opening the breastmilk bank as a good idea and further revealed that donated milk will assist infants who are unable to obtain breastmilk from their mothers.

"My feeling is a breastmilk bank is a good thing because it is going to help those babies who do not have breastmilk. Each and every child needs mother's milk to grow and that is the reason it is so important" (WC01).

Another participant added *"I think they did a very good thing by opening this bank, it is functioning well and it's very important, other babies are benefiting a lot from this bank, especially babies whose mothers passed on, they still need breastmilk which is good for their health" (WH05).*

Participants mentioned important point that the babies grow better when fed on breastmilk rather than breastmilk substitutes alluding that breastmilk contains a lot of nutrients that are important for the infants to grow well.

One of the women who participated in the study said:

"I know that my baby will grow well because breastmilk is the best as compared to formula. Babies who feed on formula develop diarrhoea than babies who are breastfeeding, so I believe the bank will help babies and they will not have diseases. Yaa..." (WC06).

The study findings also revealed that other women viewed breastmilk banks as a way to reduce family costs.

This is supported by the following quotation: *"I know that breastfeeding is very healthy for the babies and is cost effective because the breastmilk is readily available. Formula is expensive and it is not 100% like breastmilk. Breastmilk contains everything" (WC05).*

Theme 3: Acceptability of donation and receiving donated breastmilk among women.

Discussions about whether the participants would donate or accept donated breastmilk generated exciting outcomes. Most of the participants would willingly donate breastmilk, however, accepting donated breastmilk

from the milk bank yielded concerns from the participants. The major reason for the women to donate milk freely to the bank was merely to help those babies who are in need and as a way of showing altruism.

One participant said: “*I will donate my milk to the bank. Babies need breastmilk, especially for mothers who deliver through caesarean section they stay for two to three days without pumping out milk so it means the baby will not drink anything. My understanding is, by that time when we do not have milk, donated breastmilk from the bank will be beneficial*” (WC02).

Another woman said: “*It is a good thing to have such a bank at the hospital, other babies do not have milk, for example babies whose mothers passed on, so their babies will not have breastmilk. I am already volunteering to donate milk to the bank*” (WC06).

On the other hand, two women indicated their unwillingness to donate breastmilk.

One said: “*It depends if a mother wants to help, I will not donate, remember when you breastfeed you loose weight? So should I express for a child that I don't know? Let her feed on formula if the mother cannot breastfeed*”. She further said: “*No I will not give my child donated breastmilk, I don't think I am comfortable to give my child breastmilk from another mother*” (WC05).

Another woman said:

“*Yes I might donate but I cannot give my child donated milk from the bank, that is the only challenge, I mean to be honest it is difficult to express breastmilk for your own baby. I think breastfeeding is personal [laughing], I mean breastmilk is for me and my baby. It is not like the milk that we buy from the shop where everyone can drink*” (WC03). The same participants further indicated that she might accept donated breastmilk from the bank only if she knew the donor as a family member or a relative to ensure that she is comfortable with this practice.

She said:

“*No we are not sure that the milk is 100%, who is that person who donated the milk, where is she from, it was going to be better if it was my younger sister or my mother then it is understandable*” (WC03).

Women at the hospital believe that donated breastmilk will decrease the development of negative health conditions in premature babies, thus the reason for their willingness to donate and utilise the milk from the bank unlike the woman whose babies were not admitted as premature in the hospital.

A woman who participated in the hospital said: “*Yes I am donating to the bank and I will feed my baby donated milk from the bank because I know breastmilk protects babies against diseases and my baby will grow well when breastfeeding. I used to feed my first born infant formula while I was still attending school and most of the time he suffered from constipation, that is when I realised that breastfeeding is important*” (WH05). According to health belief model, it is believed that people adapt a new behaviour when they believe that the new behaviour will decrease the development of a disease (Glanz, Rimmer and Lewis, 2002).

Cultural beliefs and myths also emerged from the discussions, as other participants indicated that they will not accept donated breastmilk due to culture that does not allow feeding infants milk from another mother.

Another participant said:

“*What makes me feel not free about breastmilk bank, is the milk healthy? Doesn't it have things like “sekgalaka,”? I think that is what makes me not to feel free about using milk from the breastmilk bank*” (WC08). “Sekgalaka” refers to [rash in the body or vaginal rash], it is a myth in Sepedi which articulates that if a breastfeeding women develops rash while breastfeeding she must stop breastfeeding because the rash will be transferred to the baby.

One woman said:

“*I think is a good thing, although I am not sure if a child can drink someone else's milk {smiling}, by our culture we are not used to giving your milk to someone's else, but I can donate to the bank*” (WC04).

During the discussions, transmission of diseases particularly HIV, was raised as the main concern that made women unwilling to accept donated breastmilk from the bank.

One woman said:

“*It depends on the status of the person who donated breastmilk in terms of diseases. What I know is the most infectious disease is HIV, I don't know others, so I would like to know the status of the mother who donated the milk first before it can be given to my child*” (WC07).

Another woman indicated that:

“With regards to using donated milk, I don’t think my partner will agree that I can give my child milk from another mother; especially with the issue of many diseases these days like HIV, he will say the donor will transfer a disease to our child, so he will not agree” (WH06).

Another woman said: *“I would appreciate and be thankful if my child can receive the milk from the bank as long as the milk is tested and free from HIV, my child would get the opportunity of receiving breastmilk if I am unable to breastfeed her as long as the milk is free from HIV” (WC08).*

4. Discussion of Findings

The findings from the deliberations with the participants, showed that knowledge about the established breastmilk bank is still insufficient, especially from women at the clinic. Most of the women at the clinic did not know that breast milk bank exit in the area. Similarly, the results of this study have validated the findings of research conducted in South Australia indicating that mothers had never heard anything about breastmilk banking or knew that breastmilk banks existed in their country. Participants were not clear about the practicalities of the breastmilk bank, and how the bank is managed, which included how the milk is transported to the bank and to the recipients (Mackenzie et al., 2013). Another similar study conducted at Turkey, indicated that women had not heard anything about breastmilk banking; however, after they were informed about human milk’s banking, most of them appreciated the establishment of the bank in their city and others indicated their willingness to donate milk to the bank if a need arises (Gürol et al., 2014). In order to protect, promote and support all breastfeeding mothers and their infants, awareness campaigns about human milk banks should be increased and emphasise the importance of breastfeeding and donated human milk (DeMarchis, Israel-Ballard, Mansen, & Engmann, 2017.)

Women who were interviewed at the hospital know breastmilk bank and utilise it by donating to the bank. The participants perceived opening the breastmilk bank as a good idea and further showed that donated milk will assist infants who are unable to obtain breastmilk from the biological mothers. Similarly, a study conducted in South Africa, reported that participants appreciated the importance of breastfeeding and its role in promoting infant’s health and well-being (Coutsoudis et al., 2011b). In a qualitative study by Mackenzie et al., (2013) it was revealed that even though some participants did not hear or know about human milk banks, they perceived breastmilk to be the best nutrition for infants and supported milk donation to help other mothers and their babies.

In another study it was also confirmed that breast milk is very important for the infant’s growth and well-being, it is a life-saving and optimal choice. Therefore, infants should not be deprived of all these benefits due to non-availability of the mother, thus donor milk is the optimal nutrition of choice for those vulnerable infants who are admitted at Neonatal Intensive Care Unit (Abhulimhen-Iyoba, Okonkwo, Ideh et al., 2015). In addition to all the benefits of breastmilk and in support of these findings, breastmilk has proven to be a cost-effective and efficient method for providing all the nutritional and immunological properties that an infant needs (Gorry, 2014). Results in a qualitative study by Jahan, Rahman, Chowdhury et al, (2017) suggested that donor milk can be cost effective with significant cost savings to individuals, families and health system by reducing NEC cases, late onset sepsis, food intolerance in infants and length of hospital stay.

In the current study most of the women reported that they were willing to donate their milk to the bank with the fear of accepting donated milk due to transmission of diseases. Similarly, Senol and Aslan, (2017) reported that most of the women had positive attitude towards human milk donation and milk banking, however transmission of infectious disease and religious beliefs were found to be barriers to milk donation and acceptance. In a study done by Murray et al. (2016) in Indonesia, it was indicated that most mothers would not accept milk from a donor and would rather use formula if they could not breastfeed due to the fear that their infants would contract diseases from a donor mother. A similar study also indicated that most Nigerian mothers were more willing to donate than to accept human milk because of the fear of infecting their babies with diseases, especially HIV (Abhulimhen-Iyoha et al., 2015). A study conducted in Kwazulu-Natal in South Africa found that mothers were concerned about the safety of donated breast milk and expressed discomfort of and sensitivity to using bodily fluids from another person (Coutsoudis et al., 2011b), which is similar to the results of the current study where participants were also concerned about feeding the infants donated breastmilk with the fear of contracting diseases mainly HIV.

Furthermore, a study conducted in Hong Kong indicated that mothers expressed positive opinions on breast milk donation and were willing to contribute to the health of babies by donating safe milk to them (Leung & Yau., 2015). In addition, the findings of this study indicated that mothers whose infants were admitted at the neonatal ward were more willing to donate and to accept donated breastmilk. Similarly research also indicate that women who are unable to breastfeed their babies or who have problems with breastfeeding have more positive attitudes towards breastmilk donation and human milk banking (Senol & Aslan, 2017). In addition, another study reported that mother’s attitudes toward informal human milk sharing was positive in New York. They were open to the idea of

providing human milk to other babies and would possibly share their milk with people they knew or any other people in their community (O'Sullivan, Geraghty, & Rasmussen, 2016).

The findings of this study brought in the issue of culture as an obstacle to acceptability of donated breastmilk. Women were more willing to donate rather than to accept breastmilk due to cultural beliefs. Different cultures and religions have different perspectives on the issue of human milk sharing; therefore, cultural and religious beliefs should be implied regarding milk donation (Gürol et al., 2014). Wet-nursing has been widely acceptable in many cultures; however, in the Muslim society anonymised donor is not acceptable, due to the religious belief that the recipient infant would be considered to be the donor's child (Karadag, Ozdemir, Muhamrem et al., 2015).

Participants in this study also highlighted the cost effectiveness of using donated milk rather than buying infant formula which is costly. Michael et al. (2016) indicated that, despite the fact that donated human milk reduces morbidity and mortality rates in premature infants, it also improves neurodevelopmental outcomes and most significantly decreases the incidence of NEC, which is a devastating condition that is responsible for healthcare costs. Research also further indicated that within the vicinity of a new donor milk bank, costs were reduced in Neonatal Intensive Care Unit with particularly reduction of NEC (Arslanoglu et al., 2010; Sullivan et al., 2010). Research also indicates that donor milk is cost effective to the individuals, society, family and also health care systems by improving the health of both mothers and infants (Mackenzie et al., 2013; Yadav & Rawal, 2015). In support of these findings, breastmilk has proven to be a cost-effective and efficient method for providing all the nutritional and immunological properties that an infant need (Gorry, 2014).

4.1 Limitations of the Study

The study was limited to only two health facilities, one tertiary hospital and one feeder rural clinic in the Capricorn district. This population may not be a representative of all community members, especially those in more rural setting. A further limitation is that this study comprised of women who were breastfeeding therefore, the findings of the study cannot be generalised to all hospitals and clinics in Limpopo Province.

4.2 Recommendations

The study recommend that the established breastmilk bank should be well promoted and well publicised in Mankweng area for its effective utilisation. The study further recommends that information about breastmilk banks should be given to anyone involved in infant feeding e.g. grandparents, partners, community local leaders, in order to support, promote breastfeeding, to increase donor recruitment and utilisation of the established breastmilk bank effectively. Women, particularly at the community clinics should be educated about safety issues regarding donated breastmilk in order to dispel any misconceptions about contracting diseases from donated breastmilk. This could strengthen breastfeeding and increase number of donors and recipients in the area and reduce barriers to donation which will make an established breastmilk bank a success.

5. Conclusion

Women at the clinics have insufficient knowledge and negative attitudes towards breastmilk bank. Women who were unable to breastfeed their babies and having difficulties with breastfeeding in the neonatal ward were knowledgeable about the breastmilk bank and revealed more positive attitudes towards the established breastmilk bank. However, most of the women viewed the established breastmilk bank as a good idea and were more willing to donate rather than to receive donated milk from the bank.

Acknowledgements

The authors would like to convey gratitude and acknowledgement to women who participated in the study, and grateful thanks to the supervisors, family and colleagues for the support and encouragement they provided throughout the study.

Competing Interest Statement

The authors would like to declare that there is no financial or personal relationship(s) or benefit which may have influenced us on writing this article.

References

- Abhulimhen-Iyoha, B. I., Okonkwo, I. R., Ideh, R. C., & Okolo, A. A. (2015). Mother's perception of the use of banked human milk for feeding the infants. *Niger Journal of Paediatrics*, 42(3), 223-227. <http://dx.doi.org/10.4314/njp.v42i3.10>
- Arslanoglu, S. A., Bertino, E., Tonetto, P., Ambruzzi, A. M., Biasini, A., Profeti, C., Spreghini, M. R., & Moro, G. E. (2010). Guidelines for the establishment and operation of donor human milk. *The Journal of*

- Maternal-fetal and Neonatal Medicine*, 23(S2), 1-20. <http://doi.org/10.3109/14767058.2010.512414>
- Baker, L. D. (2017). Donor Breast Milk for the Preterm Infant. *Science & Sensibility*. Retrieved 12 December, 2018, from <https://www.scienceandsensibility.org/p/bl/et/blogid=2&blogaid=438>
- Biasini, A., Stella, M., Malaysia, L., China, M., Mazzalli, M., Laguardiao, M. C., & Rizzo, V. (2013). Establishment, operation, development of a donor human milk bank. *Early Human Development*, 89, S7-S9. <https://doi.org/10.1016/j.earlhumdev.2013.07.005>
- Coutsoudis, I., Adhikarri, M., Nair, N., & Coutsoudis, A. (2011a). Feasibility and safety of setting up a donor breastmilk bank in a neonatal prem unit in a resource limited setting: An observational, longitudinal cohort study. *BioMed Central Public Health*, 11, 356. <https://doi.org/10.1186/1471-2458-11-356>
- Coutsoudis, I., Petrites, A., & Coutsoudis, A. (2011b). Acceptability of donated breastmilk in a resource South African setting. *International Breastfeeding Journal*, 6, 3. <https://doi.org/10.1186/1746-4358-6-3>
- Creswell, J. W. (2014). *Research design: Qualitative, Quantitative and Mixed methods approach*. SAGE Publication, California
- DeMarchis, A., Israel-Ballard, K., Mansen, K. A., & Engmann, C. (2017). Establishing an integrated human milk banking approach to strengthen newborn care. *Journal of Perinatology*, 37, 469-474. <https://doi.org/10.1038/jp.2016.198>
- Department of Health, Medical Research Council, OrcMarco.2007. *South Africa Demographic Health Survey 2003. Full Report*. Pretoria: Department of Health
- Glanz, K., Rimmer, B. K., & Lewis, F. M. (2002). Health behaviour and health education. *Theory, Research and Practice*. San Francisco: Wiley & sons
- Goodfellow, H. E., Reimers, P., Israel-Ballard, K., & Coutsoudis, A. (2016). Perceptions of community-based human milk banks before and after training in a resource-limited South African setting. *South African Journal of Child Health*, 10(1), 83-86. <https://doi.org/10.7196/SAJCH.2016.v10i1.1103>
- Gorry, C. M. A. (2014). Cuba's human breastmilk bank. *Medical Education Cooperation with Cuba Review*, 16(1).
- Gürol, A., Ozkan, H., & Celebioglo, A. (2013). Turkish women's knowledge and views regarding mother's milk banking. *Collegian*, 21(3), 239-244. <https://doi.org/10.1016/j.colegn.2013.05.002>
- Horta, B. L., & Victora, C. G. (2013a). *Long term effects of breastfeeding: A systematic Review*. World Health Organisation. Geneva
- Jahan, Y., Rahman, S. M. A., Chowdhury, A. S., Chowdhury, S., & Rahman, M. M. (2017). Mother's knowledge and attitudes toward breast milk bankings in developing countries. *Annals of Pregnancy and Care*, 1(1), 1002
- Karadag, A., Ozdemir, R., Muhamrem, A. K., Ozer, A., Dogan, D. G., & Elikiran, O. (2015). Human milk banking and milk kinship: perspectives of mothers in Muslim country. *Journal of Tropical Pediatrics*, 61, 188-19. <https://doi.org/10.1093/tropej/fmv018>
- Kim, J. H., & Unger, S. (2010). Human milk banking. *Paediatric Child Health*, 15(9), 595-598. <https://doi.org/10.1093/pch/15.9.595>
- Leaf, A., & Winterson, R. (2009). Breast-milk bankings: Evidence of benefit. *Paediatric and Child Health*, 19(9):395-399. <https://doi.org/10.1016/j.paed.2009.05.013>
- Leung, J. C. Y., & Yau, S. Y. (2015). Perception of breastfeeding mothers on breastmilk donation and establishment of human breastmilk in Hong Kong: A qualitative study. *International Journal of Nursing*, 2(2), 72-80. <https://doi.org/10.15640/ijn.v2n2a9>
- Mackenzie, C., Javanparast, S., & Newman, L. (2013). Mothers' knowledge and attitudes toward human milk banking in South Australia: A qualitative study. *Journal of Human Lactation*, 29(2), 222-229. <https://doi.org/10.1177/0890334413481106>
- Michael, G., Antunes, M., Shaik, S., & Turner, J. (2016). Health practitioners' knowledge, beliefs, and attitudes regarding the use of donor human milk in neonatal intensive care. *Maternal and Paediatric Nutrition Journal*, 2(2), 108. <https://doi.org/10.4172/2472-1182.1000108>
- Murray, L., Anggrahini, S. M., Ayton J. E., & Beggs, S. (2016). Exclusive breastfeeding and the acceptability of donor breastmilk for sick, hospitalised infants in Kupang, Nusa Tenggara Timur, Indonesia: A mixed-methods study. *Journal of Human Lactation*, 32(3), 448-445.

- <https://doi.org/10.1177/0890334416649152>
- O'Sullivan, E. J., Geraghty, S. R., & Rasmussen, K. M. (2016). Informal human milk sharing: A qualitative exploration of the attitudes and experiences of mothers. *Journal of Human Lactation*, 32(3), 416-424. <https://doi.org/10.1177/0890334416651067>
- Senol, D. K., & Aslan, E. (2017). Women's opinions about human milk bank donation and human milk banking. *Biomedical Research – India*, 28(15)
- Simmer, K., & Hartmann, B. (2009). The knowns and unknowns of human milk banking. *Early Human Development*, 85, 701-704. <https://doi.org/10.1016/j.earlhumdev.2009.08.054>
- South African Breastmilk Reserve (SABR). (2017). <https://www.sabr.org.za/news.html>. (Accessed on 21 March 2018)
- South Africa. National Department of Health. (2011). Tshwane declaration of support for breastfeeding in South Africa. Breastfeeding Summit. *South African journal of clinical nutrition*, 24(4):214-216.
- South Africa. National Department of Health, Nutrition Directorate. (2014). Guidelines for the establishment and operations of Human milk bank in Kwazulu-Natal. Province of Kwazulu-Natal.
- South African Department of Health. (2013). South African Infant and Young Child Policy. Directorate Nutrition. National Department of Health.
- United Nations Children's Fund (UNICEF). (2011). Improving Newborn Care in South Africa. Improving Newborn Care in South Africa: Lesson learned from Limpopo Initiative for Newborn Care (LINC)
- Victora, C. G., Bahl, R., Barros, A. J. D., França, G. V. A., Horton, S., Krusevec, J., Rollins, N. C. (2016). Breastfeeding in the 21st century: epidemiology, mechanisms and lifelong effect. *Lancet*, 387, 475-90. [https://doi/ 10.1016/S0140-6736\(15\)01024-7](https://doi/ 10.1016/S0140-6736(15)01024-7)
- World Health Organization/UNICEF. (2003). *Global strategy for infant and young child feeding*. World Health Organization. Geneva
- Yadav, S., & Rawal, G. (2015). Human breast milk bank. *International Journal of Health Sciences & Research*. 5(6), 592-597

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).