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RESEARCH PAPER

WILLINGNESS TO DONATE AND UTILIZE HUMAN BREAST MILK AMONG PREGNANT WOMEN IN THE KORLE KLOTTEY MUNICIPALITY, GHANA.

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ABSTRACT

Human breast milk is well acknowledged as the ideal source of nutrients for the optimal growth of infants. The World Health Organization recommends that infants should be exclusively breastfed for the first six months of their lives. However, infants without mothers or who cannot breast feed need the services of Human Milk Banks (donor human breast milk). This study determined women's willingness to donate and/or utilize donor human breast milk to feed their infants and the associated factors in the Korle-Klottey Municipality of Ghana. A cross-sectional study was conducted involving 384 pregnant women obtained by a systematic sampling technique. The data were collected using a researcher administered semi-structured questionnaire and analyzed using descriptive and inferential statistics with the aid of SPSS software version 21.0. From the results, 43.2% of the participants were aware of human milk banking services. Meanwhile 64.6% showed good knowledge on aspects of human milk banking. Also, 55.5% and 33.6% respectively indicated a willingness to donate and utilize services of human milk banks. Factors associated with willingness to donate breast milk were awareness of human milk banking ($p < 0.001$) and knowledge of human milk banking ($p < 0.001$). Also, maternal age ($p = 0.006$), awareness ($p = 0.012$), and knowledge of human milk banking ($p < 0.001$) were associated with willingness to utilize donor human milk. Our study showed that there is a likelihood that the concept of human milk banking (both donation and consumption) will be successful in Ghana if there is appropriate education and awareness-building about it.

Keywords: Human Breast milk, Women, Willingness, Donation, Utilization.

INTRODUCTION

Human Breast Milk (HBM) is the optimal source of nutrition for infants. It can reduce infant morbidity and mortality, and this can partly be attributed to the fact that it is vital to the development of the immature immune system of newborns, as it comprises many bioactive ingredients (Lawrence, 2007; Furman *et al*., 2003). Research documents the various compelling benefits mothers, infants, and families derive from the practice of using human breast milk for infant feeding (Kramer *et al*., 2001). It is uniquely engineered for human infants and is the recommended way to feed infants (World Health Organisation, 2016). The benefits of breast milk include supporting the development of healthy brains in infants and young children (Martin *et al*., 2005), protecting them against infections, decreasing their risk of obesity and other diseases, and protecting nursing mothers against breast cancer and ovarian cancer (Martin, Gunnell & Smith, 2005). The World Health Organization (WHO) thus recommends exclusively breastfeeding infants for the first six (6) months of life, and breastfeeding supplemented for at least 2 years (World Health Organization & UNICEF, 2003).

Notwithstanding the progress made over the past few decades to reduce child mortality globally, an estimated 5.3 million children under age five died in 2018, and approximately half of these occurred in sub-Saharan Africa (UNICEF, 2019). The greatest number of neonatal deaths happens at the very beginning of life with three-quarters of them happening within the first week of birth (Lawn *et al*., 2005; Singh, Brodish & Suchindran (2014). The major causes of neonatal deaths worldwide include; infections, pre-term birth complications, and birth asphyxia, according to the World Health Organization (WHO, 2019). The 2019 report on child mortality in sub-Saharan Africa by UNICEF estimated neonatal mortality to be 28 deaths per 1000 live births (Muhe, McClure & Mekasha, 2019). In Ghana, the estimated infant mortality rate and neonatal mortality rate were 35 and 24 per 1000 live births respectively (Kirkwood *et al*., 2013). The WHO guidelines on reducing infant mortality stressed that exclusive breastfeeding for the first six months of the life of an infant is significant for the survival of the child.

Despite the immense evidence available on the benefits exclusive breastfeeding provides, its practice continues to be low or declining in both developing and developed countries (Alemayehu, Haider & Habte, 2009). It was reported that almost 60% of the world's infants are not receiving the six months of exclusive breastfeeding as recommended (Odom, Li & Scanlon, 2013). Ghana's exclusive breastfeeding rates for instance declined from 63% in 2008 to 52% in 2014 (World Bank, 2017). This figure is below the optimal exclusive breastfeeding rate set by the WHO/ UNICEF for developing countries, which is 90% for infants less than 6 months (World Health Organization & United Nation Children's Fund, 2009).

The prevalence of exclusive breastfeeding in developing countries is reported to be 36 percent among infants below 6 months (Khamis *et al*., 2017). Many factors, including lack of Human Milk Banks (HMBs) account for the decreasing practice of exclusive breastfeeding. Human Milk Banking is the process through which donor breast milk is collected, screened, processed, and stored, thus providing a source of human breast milk for infants who would otherwise not receive it (Haiden & Ziegler, 2016). The largest group of recipients is premature infants who derive substantial benefits from it. Human milk protects premature infants from devastating medical conditions such as necrotizing enterocolitis and sepsis (Haiden & Ziegler, 2016). The main function of milk banks is to serve as repositories of donor milk so it

is available when needed (Haiden & Ziegler, 2016). There is a multitude of evidence detailing the benefits and safety of HMBs worldwide and the role they play in increasing the rates of exclusive breastfeeding thereby reducing infant morbidity and mortality. For example, Hanson *et al*. (2002) revealed that breast milk helps initiate and stimulate a child's immune system. Similarly, according to Martin *et al* (2005), breast milk supports the development of healthy brains in infants and young children (Martin *et al*., 2005).

There are, however, no or few human milk banks in Ghana, and literature describing the factors that are associated with pregnant women's willingness to donate and utilize donor breast milk is nearly non-existent. Hence, this study seeks to contribute to filling this gap in knowledge by assessing the awareness, knowledge, attitude and factors associated with the willingness to donate and utilize donor human breast milk among pregnant women in the Korle Klottey Municipality of Ghana.

METHODOLOGY

The study adopted an analytical cross-sectional study design and a quantitative approach. A semi-structured questionnaire was used to collect the data from 384 participants. This sample size was reached using the Cochran formula below at a 95% confidence interval allowing for a 5% margin of error.

$n= Z_{1-\alpha/2}{}^2 * p\ (1-p)/\ d^2$

Where, n is the sample size

$Z_{1-\alpha/2}$ is 1.96, a standard normal variant at 5% type 1 error

p= the estimated proportion of women who are willing to donate or uses donor breast milk to feed their babies in the study area. This proportion is unknown and therefore assumed to be 50% (0.5).

d= the desired level of precision (using 5% margin of error =0.05)

Thus,

$n=1.96^2*0.5(1-0.5)/\ 0.05^2 = 384.16$

Therefore, the sample size was 384.

Participants were recruited using a systematic random sampling method. This sampling technique allows a random selection of participants who are considered as having experience in Infant and Young Child Feeding (IYCF) practices. By this, first time pregnant women were excluded. The interval system was determined to inform how the participants were recruited. From the hospital records, the average weekly attendance of ANC by pregnant women at the facility was 500, and with a sample size of 384, the sampling interval was estimated as N/n = 500/384=1.30. Hence, the sampling interval was approximated to 1.

Thus, starting with the first pregnant woman who visited the hospital on the day of data collection, every other pregnant woman who attends ANC and has at least one child was selected for the consent process.

Study population

The study population was pregnant women visiting the Antenatal Care (ANC) unit of the Trust Hospital in the Greater Accra region of Ghana. The Trust Hospital was purposively chosen due to the huge number of pregnant women who seek antenatal services at the facility daily. An average of seventy (70) pregnant women is attended to on a daily basis at the clinic. The Trust Hospital accepts walk-in clients as well as cooperate and many private insurance scheme clients. Pregnant women with varying socio-economic backgrounds seek ANC at the facility.

Data Collection

The questionnaires were administered by the researchers in the participants' language (Twi or Ga) to avoid possible misinterpretation of the questions by the participants. The questionnaire contained sections on socio-demographic characteristics, breastfeeding behavior, participant's knowledge of human milk banking, and opinions/attitudes towards human milk donation and utilization. The questionnaire was pre-tested with thirty (30) pregnant women at the LEKMA hospital before its final administration at the Trust Hospital. Ethical approval was sought from the Committee on Human Research and Publications Ethics (CHRPE) of the Kwame Nkrumah University of Science Technology (ref: CHRPE/AP/291/20). Further approval was sought from the management of the Trust Hospital. Verbal permission was sought from the obstetricians in charge at the antenatal clinic before involving the women in the study. Those who consented to the study were administered the questionnaire whiles those who declined to participate were replaced until the sample size of 384 was reached. Written consent from participants was sought after explaining the aim of the study to them before administering the questionnaires. Participants who had no formal education were asked to thumbprint their consent form. The participants were engaged only after their appointments with their service providers. A room at the facility was designated for this to ensure privacy and confidentiality.

Data Analysis

Data collected were entered into a Microsoft Excel Sheet and exported onto Statistical Package for Social Sciences (SPSS) version 21.0 for analysis. Results were evaluated with a confidence interval of 95% and a significance level of $p<0.05$. Distribution of the socio-demographic characteristics of respondents (predictor variables) and parameters that relate to willingness to accept the idea of donor human milk (outcome variable) was analyzed and reported in percentages. Binary logistic regression analysis was used to determine the socio-demographic characteristics of participants that predict willingness to donate their breast milk or use donor human milk. Measures of association were presented as odds ratios (OR).

Respondents were asked to rate a set of statements related to their attitude towards donation and utilization of human breast milk on a Likert scale. A mean score above the average of 3.00 shows a positive attitude while a score below the average of 3.00 shows a negative attitude towards human breast milk donation or utilization.

RESULTS

Demographic Characteristics *of Participants*

The demographic characteristics of the participants as shown in table 1.0 indicates that the majority of participants (72.9%) were between the ages of 30-39 and 73.7% had some form of formal education. Almost a third of the participants (31.8%) attained tertiary education The majority 280 (72.9%) were either self- employed or in the formal sector. Married women and Christians constituted 96.1% each of the study participants.

Table 1.0 Socio-demographic characteristics of Respondents

Category	Frequency	Percentage (%)
Age Category		
20–29 Years	87	22.70
30–39 Years	280	72.90
≥ 40 Years	17	4.40
Educational Background of Respondents		
No Formal Education	101	26.30
Primary Education	112	29.20
Secondary Education	49	12.80
Tertiary Education	122	31.80
Employment Status of Respondents		
Employed	280	72.9
Unemployed	104	27.1
Total	384	100
Religious Background of Respondents		
Christians	369	96.1
Muslims	15	3.9
Total	384	100
Marital Status of Respondents		
Married	369	96.1
Cohabiting	6	1.6
Single	9	2.3
Total	384	100

(**Source: Field Survey, 2020**)

Awareness and Knowledge of Pregnant Women about Human Breast Milk Banking

The results on the awareness and knowledge of pregnant women towards human breast milk banking were presented in Table 2.0 below. Less than half (43.2%) of the participants were aware of human breast milk banking with only 43.8% agreeing that donor breast milk can be as good as mother's milk. The majority of the participants were less knowledgeable on pasteurization of breast milk as only 34.9% disagreed that pasteurization destroys all the milk's nutrients. Similarly, only 27.6% knew pasteurization increases the shelf life of the milk. On the safety of donor human breast milk, most participants (69.5%) noted it as safe. Overall, 64.6% of the participants showed adequate knowledge of human breast milk banking in the areas assessed.

Table 2.0

Awareness and Knowledge of Pregnant Women about Human Breast Milk Banking

Statement on Awareness	RESPONSE	
	Yes N (%)	No N (%)
I have heard of human breast milk banking	166(43.2)	218(56.8)
Statements on Knowledge Areas		
All nursing mothers can donate human breast milk	131(34.1)	253(65.9)
Donor human breast milk is as good as a mother's milk	216(56.2)	168(43.8)
Nursing mothers who use drugs such as heroin are not qualified to donate human breast milk	346(90.1)	38(9.9)
Before mothers can donate human breast milk, they must undergo a medical examination	370(96.4)	14(3.6)
Donor human breast milk is safe for infants	267(69.5)	117(30.5)
When donor human breast milk is pasteurized, all the nutrients are destroyed	250(65.1)	134(34.9)
The reason why donor human breast milk is pasteurized is to make it stay longer	278(72.4)	106(27.6)
Breastfeeding premature infants with donor breast milk has more benefits than feeding with formula milk	312(81.3)	72(18.7)
Donor breast milk should be preserved only for a limited number of months	348(90.6)	36(9.4)
For premature babies, feeding them with donor breast milk can reduce the incidence of heart disease	257(66.9)	127(33.1)
Donor breast milk can be given to babies without pasteurization	127(33.1)	257(66.9)
Mean correct score = 7.831, Standard Deviation = 1.449, Possible range of scores= 0-13, Overall percent score = 64.6%		

(**Source: Field Survey, 2020)**

Attitude of Pregnant Women towards Donating Human Breast Milk

The results of the attitude of pregnant women towards donating human breast milk were presented in Table 3.0 below. Responses were recorded using a Likert scale with the highest level of agreement attracting the highest score of 5. The results were interpreted such that the higher the mean score for a variable or factor, the more participants agreed to it which shows a positive attitude towards human breast milk donating, and vice versa.

The results revealed that participants generally had positive attitudes towards breast milk donation, except that many find it unpleasant (Mean ±SD = 2.27 ±1.304) donating their milk to a breast milk bank. The overall mean score for the attitude of the participants towards donating breast milk was 3.18.

Table 3.0 Attitude of Pregnant Women towards Donating Human Breast Milk

Statement	Mean	Std. Deviation
The whole idea of human breast milk banking should be encouraged	3.38	1.379
Donation of breast milk to a breast milk bank is a beneficial thing	3.62	1.323
Donation of breast milk to a breast milk bank is an unpleasant thing	2.27	1.304
It is safe for nursing mothers to donate their breast milk to breast milk banks	3.43	1.191
Overall Mean Index	**3.18**	

(**Source: Field Survey, 2020)**

Attitude of Pregnant Women towards Utilizing Donor Human Breast Milk

Regarding the utilization of donor human breast milk, participants showed a positive attitude towards its usage with an overall mean score of 3.19. Most participants acknowledged the use of donor human breast milk as desirable, good, and beneficial. However, many felt it would be unpleasant feeding their babies with donor human breast milk as presented in Table 4.0 below.

Table 4.0 Attitude of Pregnant Women towards Utilizing Donor Human Breast Milk

Statement	Mean	Std. Deviation
The use of donor human breast milk from milk banks is something undesirable	3.13	1.216
The use of donor human breast milk from milk banks is something beneficial	3.72	1.255
It is culturally accepted for babies to be fed with donor human breast milk from milk banks	3.41	1.304

It will be pleasant to feed my baby with donor human breast milk	2.51	1.351
Overall Mean Index	**3.19**	

(Source: Field Survey, 2020)

Willingness of Pregnant Women to Donate and Utilize Human Breast Milk

Figures 1a and 1b provide results on the willingness of pregnant women to donate and utilize breast milk from the human milk bank. The results indicated that a little over half (55.50%) of the study participants were willing to donate their breast milk to the human milk bank. Meanwhile, only 33.6% were willing to accept and use donor human breast milk to feed their infants.

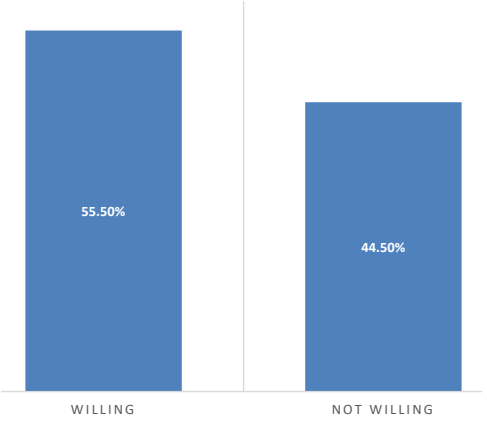

Figure 1a Willingness of Pregnant Women to Donate Human Breast Milk

(Source: Field Survey, 2020)

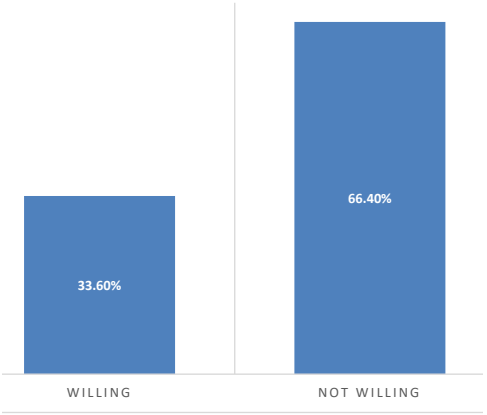

Figure 1b: Willingness of Pregnant Women to Accept and Use Donor Human Breast Milk

Factors Associated with the Willingness to Donate Human Breast Milk Among Pregnant Women

The results on the factors influencing the willingness to donate human milk among pregnant women were presented in Table 5.0. From the regression results, it was observed that the Pseudo R squared value of 0.21 connotes that 21% of the variations in the factors influencing the willingness to donate human breast milk is accounted for by the regressors (explanatory variables). Also, the Chi-square value of 64.348 is significant at a 1% significance level.

Therefore, from Table 5.0 the significant factors influencing the willingness to donate human milk were awareness of human milk banking ($p < 0.001$) and knowledge on human milk banking ($p < 0.001$). The rest of the explanatory variables did not significantly influence the willingness to donate breast milk.

Table 5.0; Multiple Logistic Regression Results for Factors Associated with the Willingness to Donate Human Breast Milk among Pregnant Women

	Regression Coefficients	Wald	P-value	Exp(B)	95% Confidence Interval for Exp(B)	
					Lower Bound	Upper Bound
Intercept	-2.645	10.284	<0.001			
Age (less than 20 years)	-0.043	0.005	0.942	0.958	0.303	3.031
Age (30-39 years)	0.147	0.072	0.789	1.158	0.396	3.387
Age (more than 40 years)	0b	.	.	.	.	.
Education (none)	-0.047	0.025	0.875	0.954	0.529	1.721
Education (primary)	-0.075	0.066	0.798	0.928	0.525	1.642
Education (secondary)	0.181	0.237	0.626	1.198	0.579	2.482
Education (tertiary)	0b	.	.	.	.	.
Religion (Christian)	0.773	1.884	0.17	2.166	0.718	6.529
Religion (Islam)	0b	.	.	.	.	.
Awareness (Aware)	1.235	26.785	<0.001	3.438	2.154	5.488
Awareness (Not aware)	0b	.	.	.	.	.
Knowledge (Have good knowledge)	1.226	23.411	<0.001	3.406	2.073	5.596
Knowledge (Do not have good knowledge)	0b	.	.	.	.	.
Pseudo R-Square = 0.21, Chi-square = 64.348						

Source: Field Survey, 2020)

Factors Associated with the Willingness to Utilize Donor Human Breast Milk among Pregnant Women

The results of the factors influencing the willingness to utilize donor human milk were presented in Table 6.0 below. Similarly, the Pseudo R squared value of 0.186 connotes that 18.6% of the variations in the factors influencing the willingness to utilize donor human milk is accounted for by the regressors (explanatory variables). Also, the Chi-square value of 54.739 is significant at a 1% significance level. The results showed that the significant factors influencing the willingness to utilize donor human milk were age ($p = 0.006$), awareness of human breast milk banking ($p = 0.012$), and knowledge on human breast milk banking ($p < 0.001$). The rest of the explanatory variables do not significantly influence the willingness to donate breast milk.

DISCUSSIONS

Findings and Interpretations

The study results revealed a low level of awareness among pregnant women regarding the practice of human milk banking in Ghana. The low level of awareness among participants on human milk banking could be attributed to the fact that human milk banks and the practice of feeding babies with donor human milk rather than the mother's milk seems largely uncommon or non-existent in the Ghanaian communities. Notwithstanding, the low level of awareness of the participants on donor milk banking (43.2%), nearly two-thirds (64.6%) of the participants showed knowledge of human milk banking. Most likely, the availability of other milk and milk products on the Ghanaian markets for daily use and feeding of babies gave participants a clue of donor human milk banking.

Specific areas of the participants' knowledge including the nutritional content of stored human milk, medical condition of donor, the shelf life of donor human milk among others was higher. This finding could also be attributed to the high level of formal education attained by many of the study participants.

Consequently, participants who were aware of and/or knew about human milk banking are more likely to demonstrate positive attitudes and more willing to donate their milk to the milk banks and vice versa. The study further showed that, although over half of the participants were willing to donate their breast milk to the human milk banks, few (33.6%) were willing to feed their babies with donor human milk. Perhaps, feeding babies from donor human milk is perceived as a cultural invasion that defeats the primary duty of a mother onto her baby. This is because breastfeeding is seen as a natural way of building an intimate social relationship between mothers and their babies among African women, and not just feeding (Fouts, Hewlett & Lamb, 2012). But considering the level of participants' attitude towards the donation and utilization of donor human milk suggest that if the concept is well introduced into the Ghanaian health system, women will be more likely to accept and utilize the services of human milk banks. This is because a concrete understanding of any program or idea may increase its acceptance and involvement. The motivation to use the services of the human milk banks is noted to significantly improve the exclusive breastfeeding rate, and hence reducing the trend in neonatal mortality (Adhisivam *et al*., 2018). Also, the growing civilization in Africa may require mothers to consider donating and using the services of human milk banks which are considered as flexible and best replacement for the mother's milk.

Table 6.0 Multiple Logistic Regression Results for Factors Associated with the Willingness to Utilize Donor Human Breast Milk among Pregnant Women

	Regression Coefficients	Wald	P-value	Exp(B)	95% Confidence Interval for Exp(B)	
					Lower Bound	Upper Bound
Intercept	-2.322	7.419	0.006			
Age (less than 20 years)	2.019	11.151	0.001	7.531	2.302	24.633
Age (30-39 years)	1.176	4.657	0.031	3.24	1.114	9.426
Age (more than 40 years)	0b	.	.	.	.	.
Education (none)	0.321	1.05	0.306	1.379	0.746	2.549
Education (primary)	-0.008	≤0.001	0.979	0.992	0.554	1.777
Education (secondary)	-0.033	0.007	0.932	0.967	0.45	2.079
Education (tertiary)	0b	.	.	.	.	.
Religion (Christian)	0.555	0.861	0.353	1.743	0.539	5.63
Religion (Islam)	0b	.	.	.	.	.
Awareness (Aware)	0.601	6.268	0.012	1.823	1.139	2.918
Awareness (Not aware)	0b	.	.	.	.	.
Knowledge (Have good knowledge)	1.264	26.724	≤0.001	3.538	2.191	5.712
Knowledge (Do not have good knowledge)	0b	.	.	.	.	.
Pseudo R-Square = 0.186, Chi-square = 54.739						

(Source: Field Survey, 2020

Differences and Similarities in relation to other studies

Our study found more potential of women accepting to donate and/or use donor human milk from the milk banks. Perhaps proper education and integration of human milk banking into the health system would improve the utilization of donor human milk in Ghana. This can potentially improve the declining exclusive breastfeeding practice rates as reported by UNICEF (2012). The 55.5% and 33.6% willingness to respectively donate and use donor human milk in the present study is an improvement from the study that was earlier conducted in Nigeria, which indicated that 39.9% of the participants accepted the concept of breast milk donation (Okonkwo, 2015). A study among some Turkish women indicated that more than half of the participants (62.5%) had heard of human milk banking compared to the present study. However, only 22.9% approved of the establishment of human milk banks and only 19.1% were willing to donate to the banks (Ergin & Uzun, 2018). The situation was worse in Ethiopia as only 10% of participants had heard about the concept of human breast milk banking and 5.6% of mothers found the concept as useful. The study further indicated that 11% were willing to donate breast milk to a milk bank (Gelano *et al*., 2018) suggesting that more women do not find it a problem donating their milk, but perhaps the problem lies with the usability.

Findings from studies by Ekşioğlu, Yeşil & Turfan EÇ (2015) in Turkey and Kenechukwu *et al* (2018) in Nigeria were consistent with the present study as they respectively found 68.8% and 60.0% of participants willing to donate their breast milk for milk banking. Kenechukwu *et al* (2018) found knowledge of human milk banking ($p = 0.001$), requirement of monetary compensation ($p = 0.001$), and preference of donor milk to formula ($p = 0.001$) as significant factors that predict willingness to donate breast milk. This study also found awareness of human milk banking ($p < 0.001$) and knowledge of human milk banking ($p < 0.001$) as significant factors that predict willingness to donate breast milk. Kenechukwu *et al* (2018) further found knowledge of human milk banking to be statistically associated with age ($p = 0.049$) and occupation ($p = 0.001$).

Study Limitations

1. By focusing on only pregnant women in this study, relevant sources of data such as from male spouses, health professionals, policymakers, community and religious leaders were left out. These are key stakeholders that can contribute to the acceptability or otherwise of human milk banking services.

2. Also, limiting the study to only the Trust Care Hospital in the Greater Accra region makes it difficult to generalize its results among the entire Ghanaian populace. This is because the hospital is situated in a setting with quite a higher educational level and socio-economic status among the residents. Many of the hospital clients are also corporate clients who visit the hospital with insurance from their organizations. Therefore, the findings of this study may differ when replicated in a rural setting.

Notwithstanding, the study collected data from a health facility that receives clients from a wide geographical area and the results could serve as important literature describing pregnant women's willingness to donate and utilize donor breast milk which is scanty in Ghana.

CONCLUSION

Our study showed that less than half of the participants were aware of the existence of human milk banking services even though

more participants were knowledgeable on breast milk banking. However, more participants were willing to donate their breast milk than those willing to utilize donated human milk. Participants' awareness of the existence of human milk banking services and their level of knowledge on human milk banking were the factors influencing the willingness to donate and utilize of human milk banking services. Maternal age influenced the willingness to utilize donated human milk.

RECOMMENDATION FOR FUTURE RESEARCH

It is recommended that future studies should be conducted in rural or peri-urban settings covering a wide geographical scope among pregnant women. Other key stakeholders such as male spouses, health professionals, policymakers, community and religious leaders should be included as study subjects.

ACKNOWLEDGEMENT

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LIST OF ABBREVIATIONS

HBM - Human Breast Milk

WHO- World Health Organization

UNICEF- United Nations International Children's Fund

ANC- Antenatal Care

HMB - Human Milk Banking

DECLARATIONS:

Ethical Approval and Consent to Participate

Ethical approval was sought from the Committee on Human Research and Publications Ethics (CHRPE) of the Kwame Nkrumah University of Science Technology (ref: CHRPE/AP/291/20). Further approval was sought from the management of the Trust Hospital. A written consent was sought from the participants prior to their participation.

Consent for publication

Not Applicable

Availability of Data and Materials

The data associated with this study is available with the first author on reasonable request.

Competing Interest

The authors report no conflict of interest.

Funding

This study was funded by the researchers only.

Authors contributions:

ABA-D, PO and E A-B conceptualized the study, wrote the background and the study protocol and sought ethical clearance for the conduct of the study. HV, BO and E A-B designed the data collection tool and collected the data. Data entry was done by KAM and RT. The statistical analysis was done by PO and ABAD and the interpretation by E A-B and HV. The manuscript was written by HV, KAM, and RT. It was revised by ABAD and BO. All authors read the manuscript and approved it.

REFERENCES

Adhisivam,B., Vishnu B., Banupriya N.,Rachel P., Nishad P. and Palanivel C. (2018) Human milk banking and challenges in Quality Control. *India J Pediatr*, 85, 255-256.

Alemayehu, T., Haidar, J., & Habte, D. (2009). Determinants of exclusive breastfeeding practices in Ethiopia. *Ethiopian Journal of Health Development*, *23*(1).

Central Statistical Agency (2011) Ethiopia Demographic and Health Survey, in Central Statistical Agency and ICF International C. Addis Ababa: ICF International

Central Statistical Agency (2011) Ethiopia Demographic and Health Survey, in Central Statistical Agency and ICF International C. Addis Ababa: ICF International

Ekşioğlu A., Yeşil Y., Turfan EÇ. (2015) Mothers' views of milk banking: sample of İzmir. *Turk Pediatri Ars.;50(2):83–9.*

Ergin A & Uzun S.U. (2018) Turkish women's knowledge, attitudes and behaviors on wet-nursing, milk sharing and human milk banking. *Maternal and Child Health J 22, 454-460.*

Fouts, H. N., Hewlett, B. S., and Lamb, M. E. (2012). A biocultural approach to breastfeeding interactions in Central Africa. *American anthropologist*, *114*(1), 123-136.

Furman, L., Taylor, G., Minich, N., & Hack, M. (2003). The effect of maternal milk on neonatal morbidity of very low-birth-weight infants. *Archives of pediatrics & adolescent medicine*, *157*(1), 66-71.

Gelano, T.F., Bacha, Y.D., Assefa, N., Motumma, A., Roba, A.A., Ayele, Y. & Tsige, F., (2018). Acceptability of donor breast milk banking, its use for feeding infants, and associated factors among mothers in eastern Ethiopia. *International breastfeeding journal*, *13*(1), pp.1-10.

Hanson, L.Å., Korotkova, M., Håversen, L., Mattsby-Baltzer, I., Hahn-Zoric, M., Silfverdal, S.A., Strandvik, B. and Telemo, E., 2002. Breast-feeding, a complex support system for the offspring. *Pediatrics International*, *44*(4), pp.347-352.

Haiden N, Ziegler EE. Human milk banking. Ann Nutr Metab. 2016;69(Suppl 2):8–15. https://doi.org/10.1159/000452821.

Kenechukwu K.I., Chidiebere D.I., Osuorah K, Ikenna K., Isaac N. Asinobi A, Ijeoma N. Obumneme-Anyim, Chijioke E., Ezeudu., Ukoha M., Onyinye U., Uchenna E., Christian C., Adaeze C. & Herbert U.O. (2018). Perception of donor breast milk and determinants of its acceptability among mothers in a developing community: a cross-sectional multi-center study in south-east Nigeria. *International Breastfeeding Journal 13: 47.*

Khamis A.G., Omar A.M., Suleiman S.A., & Ali F.S. (2017) Prevalence of exclusive breastfeeding and its predictors among mothers in Micheweni, Chake-Chake and North 'A'districts, Zanzibar. *Clin Mother Child Health*.;14:2.

Kirkwood, B. R., Manu, A., ten Asbroek, A. H., Soremekun, S., Weobong, B., Gyan, T., ... & Hill, Z. (2013). Effect of the Newhints home-visits intervention on neonatal mortality rate and care practices in Ghana: a cluster randomised controlled trial. *The Lancet*, *381*(9884), 2184-2192.

Kramer M.S, Chalmers B., Hodnett E.D., Aboud F., Mironova E., Vanilovich I., Platt R., Matush L., Igumnov S., Fombonne E., & Ducret T. (2001) Promotion of Breastfeeding Intervention Trial (PROBIT): a randomized trial in the Republic of Belarus. *JAMA*.;285:413– 420

Lawn, J. E., Cousens, S., Zupan, J., & Lancet Neonatal Survival Steering Team. (2005).

4 million neonatal deaths: when? Where? Why?. *The lancet*, *365*(9462), 891-900.

Lawrence, R. M. (2007). Human breast milk: current concepts of immunology and infectious diseases. *Curr. Probl. Pediatr. Adolesc. Health Care*, *37*, 7.

Martin, R. M., Gunnell, D., Owen, C. G., & Smith, G. D. (2005). Breast-feeding and childhood cancer: a systematic review with metaanalysis. *International Journal of Cancer*, *117*(6), 1020-1031.

Martin, R.M., Gunnell, D. and Davey Smith, G., 2005. Breastfeeding in infancy and blood pressure in later life: systematic review and meta-analysis. *American Journal of Epidemiology*, *161*(1), pp.15-26.

Muhe, L. M., McClure, E. M., Nigussie, A. K., Mekasha, A., Worku, B., Worku, A., ... & Goldenberg, R. L. (2019). Major causes of death in preterm infants in selected hospitals in Ethiopia (SIP): a prospective, cross-sectional, observational study. *The Lancet Global Health*, *7*(8), e1130-e1138.

Odom, E. C., Li, R., Scanlon, K. S., Perrine, C. G., & Grummer-Strawn, L. (2013). Reasons for earlier than desired cessation of breastfeeding. *Pediatrics*, *131*(3), e726-e732.

Okonkwo I. (2015). Mothers' perception of the use of banked human milk for feeding of the infants. *Niger J Paed*.;42:223–7.

Singh, K., Brodish, P. and Suchindran, C., (2014). A regional multilevel analysis: can skilled birth attendants uniformly decrease neonatal mortality?. Maternal and child health journal, 18, pp.242-249.

The World Bank. (2017). Exclusive breastfeeding (% of children under 6 months).

UNICEF (United Nations Children's Fund). (2012) committing to child survival: a promise renewed: progress report. New York: UNICEF.

UNICEF, U., (2019). Benefits of breastfeeding. *Retrieved April*, *20*, p.2019.

World Health Organisation (2016) Donor human milk for low-birth-weight infants. Geneva. Retrieved from http://www.who.int/elena/titles/full_recommendations/feeding_lbw/en/

World Health Organization & UNICEF (2003) Global strategy for infant and young child feeding. Geneva: World Health Organization

World Health Organization & United Nation Children's Fund. (2009) Global action plan for prevention and control of pneumonia (GAPP). Geneva: World Health Organization https://www.unicef.org/media/files/GAPP3_web.pdf.WHO/FCH/CAH/NCH/09.04. Accessed 20 April 2021.