# From Ward to Policy: Nurses' Views on Breastmilk Donation and Banking in Selected Hospitals in Bono Region, Ghana

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## Abstract

*Breast milk donation and banking provide lifesaving nutrition for preterm and vulnerable infants. However, the success of such programs depends largely on the knowledge, perceptions, and acceptability among frontline health professionals. This study assessed nurses' views on breast milk donation and banking in Bono regional hospitals, Ghana. A cross-sectional descriptive study was conducted among nurses across three selected referral hospitals in the Bono region of Ghana. Data were collected using structured questionnaires covering knowledge, perceptions, and acceptability of breast milk donation and banking. Four hundred and twenty-two (422) nurses were randomly selected for data collection. Descriptive and inferential statistics were used to analyze responses, with associations tested between socio-demographic factors and acceptability. Nurses demonstrated moderate knowledge of breast milk donation, with notable gaps in conceptual understanding and safety protocols. Perception toward breastmilk donation and banking were neutral, with recognition of donor milk's role in improving neonatal survival, though concerns about affordability and disease transmission persisted. Acceptability was high, with many nurses expressing willingness to donate or encourage donation. Age, workplace, and religion significantly influenced acceptance levels. The study concludes that while nurses in Bono regional hospitals show readiness to support breast milk donation and banking, targeted education, cultural and religious engagement, clear safety and financing frameworks are needed to address existing concerns.*

*Keywords: Acceptability, Breast Milk Banking, Donation, Ghana, Nurses' Perception.*

## Introduction

Breast milk remains the safest and most protective source of nutrition for infants, particularly during the first 6 months of life, as it provides the full complement of nutrients, along with immunological and developmental benefits vital for child survival and growth [2]. Beyond meeting nutritional needs, its non-nutrient components such as immunoglobulins and lactoferrin support intestinal maturation, immunity, and protection against infectious and inflammatory diseases [1]. The World Health Organization (WHO) recommends exclusive breastfeeding for the first six months of life and continued breastfeeding with complementary foods up to two years or beyond [2]. Exclusive breastfeeding (EBF) is one of the most effective health behaviours to reduce infant mortality and enhance health outcomes, yet global rates remain suboptimal, with only 38% of mothers achieving six months of exclusive

breastfeeding and 58% sustaining breastfeeding to two years [3].

Although nearly all women report ever breastfeeding in Ghana, exclusive breastfeeding and appropriate complementary feeding practices remain inconsistent across regions, contributing to malnutrition, stunting, diarrheal diseases, and high neonatal mortality [4]. These challenges highlight the need for safe, alternative feeding options when mothers are unable to provide sufficient milk due to medical, psychological, or socioeconomic constraints [5]. While informal milk sharing has historically been practiced, particularly among women with close social ties, the practice carries risks when not screened or regulated, as it may expose infants to transmissible infections such as HIV, hepatitis, and syphilis [6]. The best solution endorsed by global health authorities is donor human milk banking, which involves structured systems of collection, screening, processing, and distribution of breast milk to infants in need [7].

Donor human milk banking has demonstrated remarkable achievements in improving infant survival worldwide. For instance, Brazil's national human milk banking network contributed to a 73% reduction in neonatal mortality between 1990 and 2013 [8]. African countries such as Kenya and South Africa have also piloted milk banks despite challenges of infectious disease burden and sociocultural concerns [9]. These successes underline the potential of donor milk banking to reduce preventable neonatal deaths and promote child health [10]. However, in low and middle-income countries such as Ghana, implementation is still at an early stage, with significant barriers to acceptance due to limited awareness, cultural and religious beliefs, mistrust of health systems, and concerns about safety and hygiene [11].

While exclusive breastfeeding is widely promoted in Ghana, the absence of formal milk banking systems means infants deprived of maternal milk often rely on suboptimal alternatives such as early introduction of porridges, semisolids, or infant formulas, which can increase risks of infection and malnutrition [12]. A safe and regulated donor breast milk bank presents the most viable and protective alternative [13]. Yet, successful adoption depends on acceptability, particularly among healthcare providers who are both advocates and implementers of maternal and newborn health policies [14]. Nurses, as frontline caregivers in maternity and neonatal wards, play a critical role in shaping public perceptions and ensuring adherence to safe infant feeding practices [2]. Despite their central role, little is known about nurses' knowledge, perceptions, willingness to accept breast milk donation and banking in Ghana, and the association between sociodemographic factors and the acceptability of donor breast milk banking [7]. Without this understanding, efforts to establish donor milk banks risk resistance and underutilization, which may compromise their potential benefits [12].

This study, therefore, seeks to bridge that gap by exploring nurses' views on breast milk donation and banking in Bono regional hospitals. Specifically, it examines nurses' knowledge, perceptions, acceptability and association between sociodemographic factors and acceptability of donor breastmilk banking, thereby generating evidence to inform both practice and policy.

The novelty of this work lies in situating nurses' voices at the center of discourse on donor milk banking in Ghana, moving the conversation 'from ward to policy.' By doing so, the study contributes to understanding the feasibility of implementing milk banking in a culturally diverse setting while aligning with Sustainable Development Goals 2 and 3 on nutrition, health, and wellbeing [15]. Ultimately, findings will provide actionable insights to guide policy formulation, capacity

building, and strategies to improve neonatal survival in Ghana.

## Materials and Methods

### Study Design

The study was a cross-sectional study conducted among health workers in the Bono region of Ghana. It aimed to document their views and perceptions regarding the acceptability of breast milk donation and banking. Health workers were selected as the study population because they play a critical role in maternal and child health service delivery and are key influencers in shaping community attitudes and practices toward breast milk banking. Understanding their perspectives is essential for assessing the feasibility of introducing or scaling up human milk banking initiatives in Ghana, as their support and acceptance are pivotal for successful implementation and public trust.

### Study Area

The study was conducted in three health facilities in the Bono Region of Ghana; Sunyani Teaching Hospital, Sunyani Municipal Hospital, and Tain District Hospital, Nsawkaw. These facilities were selected because they serve as referral centres under the Ghana Health Service and have a high population of nurses and midwives, making them suitable for reflecting the target population. Sunyani Teaching Hospital, established in 1927, has been transformed into a modern tertiary facility with a 330-bed capacity, 15 wards, and a 24-hour emergency unit, serving as the main referral hospital for the region. Sunyani Municipal Hospital, also established in 1927 and later upgraded to municipal status in 2004, has a 95-bed capacity and a staff strength of over 800, providing both general and specialized services including medical, surgical, obstetric, pediatric, diabetic, asthma, eye, ENT, and dental care. Tain District Hospital, which began as a health center in 1965 and was upgraded in 2010, operates as a referral facility for the Tain district with a 32-bed capacity, providing services such as diabetes, hypertension, physiotherapy, and eye care.

### Study Population

The study population consisted of 1,128 nurses drawn from three major hospitals in the Bono region of Ghana. These hospitals were purposively selected because they serve as key referral centres and represent different levels of the healthcare system, thus providing a comprehensive overview of nurses' experiences and perspectives. Nurses were chosen as the study population because they constitute the largest proportion of the healthcare workforce and are directly involved in maternal, neonatal, and child health services, where breast milk donation and banking are most relevant.

Their close interactions with mothers and infants place them in a unique position to influence attitudes and practices related to breastfeeding and human milk banking. Documenting their views, therefore, provide valuable insight into the potential facilitators and barriers to implementing breast milk donation and banking within healthcare settings. The inclusion of a large and diverse group of nurses from multiple hospitals also enhances the generalizability of the findings and ensures that the results reflect a range of institutional and professional perspectives.

### Sample Size Determination

The sample size for the study was determined using Yamane's formula for sample size calculation [16]. This formula is commonly applied in survey research when the total population size is known, as it provides a simplified yet statistically sound method for determining an appropriate sample size. Yamane's formula takes into account the desired level of precision and the acceptable

margin of error, thereby ensuring that the selected sample adequately represents the target population.

This approach was appropriate for the current study because the total population of nurses (1,128) across the three hospitals was known. Using Yamane's formula allowed the researchers to determine a manageable yet statistically reliable sample size that balances accuracy with practical considerations such as time and resource constraints. By applying this method, the study a sample size of 422 was calculated.

### Data Collection Tool

Data collection tool was a structured questionnaire. The questionnaire comprised of sections covering socio-demographic characteristics, knowledge, perceptions, and acceptability of breastmilk donation and banking. Responses were measured using binary, categorical, and Likert-type scales.

### Data Analysis

Collected data were cleaned, coded, and analyzed using the Statistical Package for the

Social Sciences (SPSS) version 26. Descriptive statistics such as frequencies, percentages, means, standard deviation and 95% confidence interval were used to summarize the data. Composite mean scores were computed for each domain (knowledge, perception and acceptability), and interpretation benchmarks were applied to classify responses as high/positive, neutral/average, or low/negative. Association between respondents' sociodemographic factors and acceptability of donor breastmilk banking employed Chi-square test of independence with p-value $\leq 0.05$ as statistically significant. Ethical approval for the study was obtained from the Kwame Nkrumah University of Science and Technology Ethics Review Board, Ghana.

### Results

### Sociodemographic characteristics of Respondents

Table 1 below shows respondents sociodemographic characteristics.

**Table 1.** Sociodemographic Characteristics (N= 422)

| Sociodemographic characteristics of Respondents | Frequency (N=422) | Percent (%) |
|---|---|---|
| **Age (in years)** | | |
| 20-29 years | 188 | 44.5 |
| 30-39 years | 222 | 52.7 |
| 40-49 year | 12 | 2.8 |
| Mean ± SD 33.33% ± 0.27 | | |
| **Gender** | | |
| Female | 334 | 79.2 |
| Male | 88 | 20.8 |
| **Health facility** | | |
| Sunyani Teaching Hospital | 261 | 61.8 |
| Sunyani Municipal Hospital | 97 | 23.0 |
| Tain District Hospital | 64 | 15.2 |
| **Professional category** | | |
| RGN | 224 | 53.1 |
| Midwife | 111 | 26.3 |
| Enrolled Nurse (EN) | 72 | 17.1 |

| | | |
|---|---|---|
| Community Health Nurse (CHN) | 15 | 3.5 |
| **Educational attainment** | | |
| Masters | 2 | 0.5 |
| Degree | 87 | 20.6 |
| Diploma | 255 | 60.4 |
| Certificate | 78 | 18.5 |
| **Marital Status** | | |
| Married | 192 | 45.5 |
| Single | 212 | 50.2 |
| Widow | 18 | 4.3 |
| **Number of children** | | |
| 0 | 246 | 58.3 |
| 1-2 | 126 | 29.9 |
| 3-4 | 49 | 11.6 |
| ≥5 | 1 | 0.2 |
| **Religion** | | |
| Christian | 290 | 68.7 |
| Muslim | 108 | 25.6 |
| Traditional | 15 | 3.6 |
| Others | 9 | 2.1 |
| **Tribe of respondent** | | |
| Ashanti | 195 | 46.2 |
| Bono | 203 | 48.1 |
| Others | 24 | 5.7 |

A total of 422 respondents participated in the study representing a 100% response rate. The respondents were aged between 20 and 49 years, with a mean age of 33.33 ± 0.27 years. Majority (52.7%) were within the age group 30-39 years, indicating a predominantly youthful workforce.

A significant majority of the respondents were females (79.2%), while males constituted (20.8%), reflecting the female-dominated nature of the Nursing and Midwifery profession in Ghana. Most respondents (61.8%) worked at Sunyani Teaching Hospital, followed by Sunyani Municipal Hospital (23.0%) and Tain District Hospital (15.2%). Over half (53.1%) were Registered General Nurses (RGNs), (26.3%) were midwives, (17.1%) enrolled nurses, and (3.5%) community health nurses. In terms of educational attainment, (60.4%) held diploma qualifications, (20.6%) had degree, (18.5%) had certificate, and only (0.5%) had a master's degree. Marital status showed (50.2%) single, (45.5%) married, and (4.3%) widowed. Regarding family size, (58.3%) had no children, (29.9%) had 1-2 children, (11.6%) had 3-4 children, and just (0.2%) had five or more. Christianity was the dominant religion (68.7%), followed by Islam (25.6%), traditional beliefs (3.6%), and other faiths (2.1%). Ethnically, respondents were mainly Bono (48.1%) and Ashanti (46.2%), with other tribes accounting for (5.7%).

**Knowledge on Breastmilk Donation and Breastmilk Banking**

Table 2 below indicates respondents' knowledge on breastmilk donation and banking.

**Table 2.** Knowledge on Breastmilk Donation and Banking (N = 422)

| Variable | Frequency N = 422 | Percentage (%) | Mean ± SD | 95% Conf. Interval |
|---|---|---|---|---|
| **Awareness of human breastmilk donation and breastmilk banking** | | | | |
| Yes | 205 | 48.6 | 0.486±0.500 | 0.438-0.534 |
| No | 217 | 51.4 | | |
| **Source of information on breastmilk donation and banking** | | | | |
| Health workers | 79 | 38.5 | 2.0±1.034 | 1.86-2.14 |
| Internet | 72 | 35.1 | | |
| Media | 34 | 16.6 | | |
| Formal education | 15 | 7.3 | | |
| Others | 5 | 2.5 | | |
| **Definition of human breastmilk donation and banking** | | | | |
| A recognized service which is responsible for collecting, screening, processing and dispensing of human milk through prescription. The breast milk is donated by nursing mothers who are not the biological mothers of the recipient infants | 285 | 67.5 | 3.20±1.24 | 3.08-3.31 |
| The practice of breastfeeding another person's child | 21 | 4.9 | | |
| Expressing breast milk and storing in fridge to feed your baby | 30 | 7.1 | | |
| No idea | 86 | 20.5 | | |
| **Should donor breast milk be processed before giving to babies?** | | | | |
| Yes | 350 | 82.9 | 1.170±0.377 | 1.134-1.206 |
| No | 72 | 17.1 | | |
| **Is breastmilk banking beneficial to babies who have lost their mothers** | | | | |
| Yes | 366 | 86.7 | 1.206±0.558 | 1.153-1.259 |
| No | 25 | 5.9 | | |
| No Idea | 31 | 7.4 | | |
| **Can breastmilk banking contribute to reduction in infant mortality** | | | | |
| Yes | 323 | 76.5 | 1.377±0.721 | 1.308-1.446 |
| No | 39 | 9.2 | | |
| No Idea | 60 | 14.3 | | |
| **Will there be any cultural, religious and ethical concerns from Ghanaians** | | | | |
| Yes | 280 | 66.4 | 1.337±0.473 | 1.292-1.382 |
| No | 142 | 33.6 | | |
| **Will the activities of some religious and traditional leaders influence breastmilk donation and banking** | | | | |
| Yes | 233 | 55.2 | 1.510±0.612 | 1.452-1.568 |

| | | | | |
|---|---|---|---|---|
| No | 163 | 38.6 | | |
| No Idea | 26 | 6.2 | | |
| **Will the regulation of certain religious churches be useful at promoting breastmilk donation and banking** | | | | |
| Yes | 217 | 51.4 | 1.571±0.645 | 1.509-1.633 |
| No | 169 | 40.0 | | |
| No Idea | 36 | 8.6 | | |
| **Will breastmilk banking have negative effects on the Ghanaian environment** | | | | |
| Yes | 66 | 15.6 | 1.846±0.364 | 1.811-1.881 |
| No | 356 | 84.4 | | |
| **Reasons for processing donor breastmilk before banking and consumption** | | | | |
| **To make it safe for consumption** | | | | |
| Yes | 323 | 76.5 | 1.483±0.774 | 1.409-1.557 |
| No | 12 | 2.8 | | |
| No Idea | 87 | 20.7 | | |
| **To prevent infection and microbial growth** | | | | |
| Yes | 317 | 75.1 | 1.477±0.767 | 1.404-1.550 |
| No | 20 | 4.7 | | |
| No Idea | 85 | 20.2 | | |
| **To increase the quantity of the milk** | | | | |
| Yes | 178 | 42.2 | 1.590±0.783 | 1.515-1.665 |
| No | 141 | 33.4 | | |
| No Idea | 103 | 24.4 | | |
| **To prolong its life span** | | | | |
| Yes | 290 | 68.7 | 1.490±0.782 | 1.415-1.565 |
| No | 38 | 9.0 | | |
| No Idea | 94 | 22.3 | | |
| **To improve upon the taste of the milk** | | | | |
| Yes | 165 | 39.1 | 1.626±0.796 | 1.550-1.702 |
| No | 145 | 34.4 | | |
| No Idea | 112 | 26.5 | | |
| **To preserve the nutrient content of the milk** | | | | |
| Yes | 292 | 69.2 | 1.501±0.784 | 1.426-1.576 |
| No | 36 | 8.5 | | |
| No Idea | 94 | 22.3 | | |
| **Overall knowledge of respondents was average with mean score 1.617** | | | | |

The knowledge assessment on breastmilk donation and banking revealed mixed results across the 16 knowledge indicators. Mean scores ranged from 0.486 (awareness of human breastmilk donation and banking) to 3.200 (definition of breastmilk donation and banking).

Items such as 'Should breastmilk be processed before giving to babies' (M = 1.170, SD = 0.377, CI = 1.134-1.206) and "Is breastmilk banking beneficial to babies who

have lost their mothers" (M = 1.206, SD = 0.558, CI = 1.153-1.259) fell within the good knowledge range, indicating strong awareness on these aspects.

However, higher mean values were recorded for questions asked on the definition of breastmilk donation and banking (M = 3.200, SD = 1.240, CI = 3.080-3.310) and awareness sources (M = 2.000, SD = 1.034, CI = 1.860-2.140), indicating limited or poor knowledge in those domains.

Knowledge on the cultural, religious, and environmental implications of breastmilk banking varied, with mean scores between 1.337 and 1.846, generally falling within the average knowledge category.

The overall weighted mean score for all knowledge items was 1.617, placing respondents in the 'average knowledge' category according to the study's benchmarks

(1.50-2.49). The 95% confidence intervals for most of the knowledge questions were narrow, reflecting high precision of the estimates, although some items with higher standard deviations showed more variability in responses. This pattern suggests that while respondents demonstrated good knowledge in certain practical and health-related aspects of breastmilk banking, there were substantial knowledge gaps in conceptual definition of breastmilk donation and banking, sources of information, and broader socio-cultural implications.

**Perception towards Breastmilk Donation and Breastmilk Banking**

Table 3 below presents respondents perception towards breastmilk donation and banking.

**Table 3.** Perception towards Breastmilk Donation and Banking

| Perception towards breastmilk donation and banking (N= 422) | N (%) | Mean ± SD | 95% Conf. Interval |
|---|---|---|---|
| **Breastmilk banks has safe breastmilk** | | | |
| Yes | 316(74.9) | 1.430±0.732 | 1.360-1.500 |
| No | 38(9.0) | | |
| No Idea | 68(16.1) | | |
| **It helps reduce morbidity and mortality of pre-terms and orphans in hospital** | | | |
| Yes | 349(82.7) | 1.371±0.675 | 1.307-1.435 |
| No | 28(6.6) | | |
| No Idea | 45(10.7) | | |
| **Breastmilk banks are effective in removing all risk of disease or infection including HIV** | | | |
| Yes | 237(56.2) | 1.541±0.724 | 1.471-1.611 |
| No | 121(28.7) | | |
| No Idea | 64(15.1) | | |
| **Breastmilk banks are affordable** | | | |
| Yes | 187(44.3) | 1.682±0.796 | 1.605-1.759 |
| No | 106(25.1) | | |
| No Idea | 129(30.6) | | |
| **Overall perception of the respondents was neutral with mean score 1.506** | | | |

The perception assessment of breastmilk donation and banking yielded mean scores ranging from 1.371 to 1.682. Respondents expressed the most positive perception towards the statement "It helps reduce morbidity and mortality of pre-terms and orphans in hospitals" (M = 1.371, SD = 0.675, CI = 1.307-1.435), indicating strong agreement with the health benefits of breastmilk banking. Similarly, the perception that "A breastmilk bank has safe breastmilk" was rated positively (M = 1.430, SD = 0.732, CI = 1.360-1.500).

However, perceptions were less positive regarding affordability (M = 1.682, SD = 0.796, CI = 1.605-1.759) and the belief that breastmilk banks can eliminate all risks of disease or infection (M = 1.541, SD = 0.724, CI = 1.471-1.611). These results suggest uncertainty or skepticism among respondents about the full safety and cost-effectiveness of breastmilk banks.

The overall mean score of 1.506 recoded, places respondents' perceptions in the 'neutral category' according to the set benchmarks (1.50-2.49). This implies that while there is general recognition of the benefits and safety of breastmilk banking, concerns remain regarding affordability and complete disease risk removal. The relatively narrow 95% confidence intervals for all items indicate precise estimates, although the moderate standard deviations suggested variability in individual perceptions.

## Acceptability of Breastmilk Donation and Breastmilk Banking

Results obtained from respondents' acceptability of breastmilk donation and banking is indicated in table 4 below.

**Table 4.** Acceptability of Breastmilk Donation and Banking

| Acceptability of breastmilk donation and banking (N= 422) | N (%) | Mean ± SD | 95% Conf. Interval |
|---|---|---|---|
| **Would you accept donor breastmilk to feed your own baby?** | | | |
| Yes | 245(58.1) | 1.422±0.494 | 1.374-1.470 |
| No | 177(41.9) | | |
| **Would you agree to donate or allow a relative/partner to donate breastmilk to milk banks?** | | | |
| Yes | 350(82.9) | 1.171±0.377 | 1.135-1.207 |
| No | 72(17.1) | | |
| **Should it be donated free?** | | | |
| Yes | 255(60.4) | 1.396±0.490 | 1.348-1.444 |
| No | 167(39.6) | | |
| **Does your religion support breastmilk donation and breastmilk banking** | | | |
| Yes | 321(76.1) | 1.239±0.427 | 1.198-1.280 |
| No | 101(23.9) | | |
| **Does your tribe support breastmilk donation and breastmilk banking** | | | |
| Yes | 308(72.9) | 1.270±0.444 | 1.227-1.313 |
| No | 114(27.1) | | |
| **Do you understand how this intervention will work** | | | |
| Yes | 267(63.3) | 1.367±0.483 | 1.321-1.413 |
| No | 155(36.7) | | |

| **Do you feel excited about this intervention** | | | |
|---|---|---|---|
| Yes | 359(85.1) | 1.146±0.354 | 1.112-1.180 |
| No | 63(14.9) | | |
| **Will this intervention be a good fit with the cultural values of your community** | | | |
| Yes | 335(79.4) | 1.206±0.405 | 1.167-1.245 |
| No | 87(20.6) | | |
| **Will this intervention take too much time to implement** | | | |
| Yes | 351(83.2) | 1.168±0.372 | 1.130-1.202 |
| No | 71(16.8) | | |
| **Will you be confident in delivering this intervention** | | | |
| Yes | 352(83.4) | 1.166±0.372 | 1.130-1.202 |
| No | 70(16.6) | | |
| **Will you lose anything valuable whilst engaging in this intervention** | | | |
| Yes | 161(38.2) | 1.618±0.487 | 1.571-1.665 |
| No | 261(61.8) | | |
| **Is this intervention likely to improve exclusive breastfeeding** | | | |
| Yes | 367(86.9) | 1.130±0.337 | 1.098-1.162 |
| No | 55(13.1) | | |
| **Overall acceptability by respondents was high with mean score 1.192** | | | |

Acceptability of breastmilk donation and banking was assessed using 12 close ended questions, each measured on a yes or no response framework coded numerically to determine mean scores. The results indicate 'high acceptance' with an overall mean score of 1.192, placing it within the positive acceptability benchmark.

The question "Is this intervention likely to improve exclusive breastfeeding" recorded the lowest mean score (M = 1.130, SD = 0.337, CI = 1.098-1.162), suggesting the strongest agreement among respondents. Similarly, "Do you feel excited about this intervention" (M = 1.146, SD = 0.354, CI = 1.112-1.180) and "Would you agree to donate or allow a relative/partner to donate breastmilk to a milk bank" (M = 1.171, SD = 0.377, CI = 1.135-1.207) also ranked highly positive.

However, the statement "Will you lose anything valuable whilst engaging in this intervention" recorded the highest mean score (M = 1.618, SD = 0.487, CI = 1.571-1.665), still within the positive range but indicating some concerns about potential personal costs.

The low standard deviations recoded across most questions reflect minimal variability, meaning respondents generally shared similar opinions. Furthermore, the narrow 95% confidence intervals demonstrate high precision in the estimates, implying that the sample mean values are close to the true population means.

## Category of Babies that Requires Breastmilk Donation and Breastmilk Banking

Table 5 below illustrate babies that require breastmilk donation and banking.

**Table 5.** Babies that Require Breastmilk Donation and Banking

| Babies that require breastmilk donation and banking (N= 422) | N (%) | Mean ± SD | 95% Conf. Interval |
|---|---|---|---|
| **Babies from mothers with maternal infections** | | | |
| Agree | 290(68.7) | 1.420±0.692 | 1.355-1.485 |
| Neutral | 87(20.6) | | |
| Disagree | 45(10.7) | | |
| **Babies with infections and or congenital abnormalities** | | | |
| Agree | 230(54.5) | 1.512±0.770 | 1.439-1.585 |
| Neutral | 105(24.9) | | |
| Disagree | 87(20.6) | | |
| **Babies whose mothers died after giving birth** | | | |
| Agree | 373(88.4) | 1.161±0.437 | 1.119-1.203 |
| Neutral | 41(9.7) | | |
| Disagree | 8(1.9) | | |
| **Babies born to mothers who are not willing to breastfeed** | | | |
| Agree | 282(66.8) | 1.447±0.788 | 1.371-1.523 |
| Neutral | 67(15.9) | | |
| Disagree | 73(17.3) | | |
| **As a prescription for babies** | | | |
| Agree | 245(58.1) | 1.509±0.788 | 1.433-1.585 |
| Neutral | 95(22.5) | | |
| Disagree | 82(19.4) | | |
| **Overall acceptability for babies was also high with mean score 1.410** | | | |

Results of the five questions measuring the 'category of babies that requires breastmilk donation and breastmilk banking' showed mean scores ranging from 1.161 to 1.512 on a 3-point Likert scale (1=Agree, 2=Neutral, 3=Disagree). The computed overall weighted mean was 1.410, which falls within the 1.00-1.49 benchmark, indicating a 'good level of acceptance' among respondents. This suggests that the majority of nurses agree with breastmilk donation and banking for babies with infections and congenital abnormalities,

babies whose mothers died after delivery and others. The low standard deviations recorded indicates relatively consistent responses given by the respondents. The 95% confidence interval recorded ranges from ± 0.046 to ± 0.077 around the mean. This narrow spread shows high precision and reliability in the responses.

Table 6 below presents the association between sociodemographic factors and acceptability of donor breastmilk banking.

**Table 6.** Association between Sociodemographic Factors and Acceptability of Donor Breastmilk Banking

| Socio-Demographic characteristics of respondents | Acceptability of Breastmilk Donation and Banking (N= 422) | | X² | P-value | df | Interpretation |
|---|---|---|---|---|---|---|
| | Yes N (%) | No N (%) | | | | |
| **Age (In years)** | | | | | | |
| ≤30 years | 101(51.8) | 92(48.2) | 4.364 | 0.037 | 1 | Significant: Age is associated with acceptability. Older nurses (>30 years) were more likely to accept breastmilk donation and banking |
| >30 years | 144(62.9) | 85(37.1) | | | | |
| **Gender** | | | | | | |
| Female | 195(58.4) | 139(41.6) | 0.021 | 0.886 | 1 | Not Significant: No difference between males and females in acceptability |
| Male | 50(56.8) | 38(43.2) | | | | |
| **Health facility** | | | | | | |
| Sunyani Teaching Hospital | 141(45.0) | 120(46.0) | 6.883 | 0.032 | 2 | Significant: Acceptability differ across facilities with highest at Tain District Hospital |
| Sunyani Municipal Hospital | 58(59.8) | 39(40.2) | | | | |
| Tain District Hospital | 46(71.9) | 18(28.1) | | | | |
| **Professional category** | | | | | | |
| Registered nurses | 194(57.9) | 141(42.1) | 0.000 | 1.000 | 1 | Not Significant: Registered vs non-registered nurses showed no difference in acceptability |
| Non registered nurses | 51(58.6) | 36(41.4) | | | | |
| **Educational level** | | | | | | |
| Tertiary | 50(56.2) | 39(43.8) | 0.080 | 0.777 | 1 | Not Significant |
| Non-tertiary | 195(58.6) | 138(41.4) | | | | |
| **Marital status** | | | | | | |
| Married | 104(54.2) | 88(45.8) | 1.361 | 0.243 | 1 | Not Significant |
| Unmarried | 141(61.3) | 89(38.7) | | | | |
| **Number of children** | | | | | | |
| Nurse with no child | 153(62.2) | 93(37.8) | 3.751 | 0.053 | 1 | Borderline (p=0.05): Nurses with children were slightly less likely to accept but it was not statistically significant |
| Nurses with child | 92(52.3) | 84(47.4) | | | | |
| **Religion** | | | | | | |
| Christian | 178(53.9) | 152(46.1) | 11.999 | 0.002 | 2 | Significant: Acceptability differs by religion with highest among 'others' |
| Islam | 22(64.7) | 12(35.3) | | | | |
| Others | 45(77.6) | 13(22.4) | | | | |
| **Tribe of respondents** | | | | | | |
| Ashanti | 108(55.4) | 87(44.6) | 2.274 | 0.321 | 2 | |

| Bono | 120(59.1) | 83(40.9) | | | | Not Significant: There were no difference across tribes with regards to breastmilk donation and banking acceptability |
| Others | 17(70.8) | 7(29.2) | | | | |

A statistically significant association was found between age of respondents and acceptability of donor breastmilk ($\chi^2$ = 4.364, df = 1, p = 0.037). Respondents aged above 30 years were more likely to accept breastmilk donation compared to those aged 30 years or younger. Similarly, there was a significant relationship between health facility of practice and acceptability ($\chi^2$ = 6.883, df = 2, p = 0.032). The highest proportion of acceptability was reported among nurses from Tain District Hospital compared to Sunyani Teaching Hospital and Sunyani Municipal Hospital. Religion was also found to be significantly associated with acceptability ($\chi^2$ = 11.999, df = 2, p = 0.002). Nurses who belonged to "other" religions (non-Christian and non-Islamic) expressed the highest acceptance of donor breastmilk, compared to their Christian and Muslim counterparts.

However, gender ($\chi^2$ = 0.021, p = 0.886), professional category ($\chi^2$ = 0.000, p = 1.000), educational level ($\chi^2$ = 0.080, p = 0.777), marital status ($\chi^2$ = 1.361, p = 0.243), and tribe ($\chi^2$ = 2.274, p = 0.321) showed no significant association with acceptability of breastmilk donation.

Although the relationship between number of children and acceptability did not reach statistical significance ($\chi^2$ = 3.751, df = 1, p = 0.053), the result was at the borderline, suggesting that nurses with children were slightly less likely to accept breastmilk donation compared to those without children.

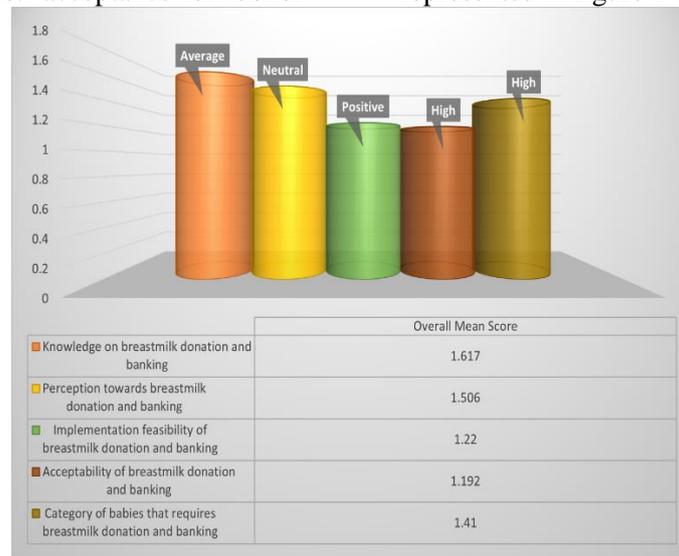Also, the summary of the finding is represented in figure 1 below.



**Figure 1.** Summary of results

## Discussion

The findings of this study address the objectives set out in the introduction by documenting nurses' knowledge, perceptions, and acceptability of breastmilk donation and banking in Bono regional hospitals, and by identifying socio-demographic factors associated with acceptability.

Regarding objective one (knowledge), respondents demonstrated an overall average knowledge level (overall weighted mean = 1.617) with relatively strong understanding of practical, health-related items (for example, that milk should be processed and that donor milk benefits infants who have lost their mothers), yet clear gaps in core conceptual areas such as the formal definition of milk banking and common sources of information were observed. This mixed profile practical/clinical awareness paired with weaker conceptual and information on breastmilk banking knowledge mirrors findings from several recent studies in similar settings, which report that health workers often recognize the clinical value of donor milk but lack comprehensive, standardized knowledge about milk bank processes and governance [17]. For example, cross-sectional and qualitative work in African settings and in Ghana specifically has documented reasonable awareness of the value of donor milk alongside confusion about screening, safety and operational details [4].

On the second objective (perceptions), nurses in this study expressed neutral perceptions toward key health benefits of milk banking (overall mean = 1.506). Particularly agreement that donor milk reduces morbidity and mortality among pre-terms and orphans and that bank can provide safely processed milk. However, nurses were less confident about affordability and the complete elimination of disease risk. This ambivalence is consistent with recent literature indicating that health professionals and community members tend to endorse the conceptual health advantages of donor human milk yet remain cautious due to residual safety concerns and uncertainty about costs and logistics [1]. Several recent syntheses and field studies stress that perceived safety (screening, pasteurization, traceability) and cost are central determinants of acceptability [13].

The third objective (acceptability) found a generally high willingness to accept and support donor milk banking (overall mean = 1.192), with particularly strong agreement that the intervention would support exclusive breastfeeding and with many respondents indicating personal willingness to donate or to permit relatives to donate. Low variability and narrow confidence intervals indicate this acceptability is fairly consistent across respondents. These results align with Ghanaian and other African reports where health workers commonly express conditional acceptability [15]. That is, acceptance is provided that safety procedures and public education are in place and are similar to those in multi-site studies in Zimbabwe [9]. Uganda and elsewhere that document comparable willingness among health professionals to promote or use banked milk when assured of safety and governance [9].

The observed associations between acceptability and socio-demographic characteristics (older age >30 years, place of work, and religious affiliation) provide useful nuance for targeted implementation. The greater acceptance among nurses older than 30 years may reflect greater clinical experience, exposure to neonatal care, or familiarity with the harms of suboptimal substitutes for breastmilk. Patterns reported in other studies where experience and professional exposure predicted greater willingness to support donor milk initiatives [11]. Differences by facility (highest acceptability at the Tain District Hospital) likely reflect local institutional culture, prior exposures or differences in patient case-mix (e.g., a busier neonatal unit) [18]. The strong association with religion (higher acceptance among respondents in the "other" religions category) highlights the well-documented role of cultural and religious beliefs, including concerns about kinship / milk-sibling relationships in some faiths in shaping both donation and receipt of donor milk

[3]. These findings comport with reviews and primary studies showing religion and cultural norms as recurrent barriers or facilitators depending on how milk-banking is framed and regulated [10].

Taken together, the pattern of results has several practical implications. First, the combination of reasonable practical knowledge but weaker conceptual understanding suggests that capacity-building for nurses should prioritize standardized education on definitions, screening algorithms, pasteurization and traceability protocols, and on sources of validated information and not only clinical benefits [5].

Training curricula and in-service modules developed for Ghanaian contexts (and used successfully in other African settings) could close these gaps and strengthen frontline advocacy for banks [19]. Second, the neutral perceptions about affordability and residual risk indicate the need for transparent communication about safety measures (serological screening, pasteurization, storage standards) and about funding models (public subsidization, integration into maternal-newborn care budgets or insurance coverage) [17]. Evidence from countries with established HMBs shows that embedding milk banks within national newborn care policies and financing frameworks reduces cost barriers and increases uptake [7].

The study's results are largely consistent with other recent work but also add local specificity. For example, Tende et al., found that Ghanaian health workers generally accepted the concept of donor milk banking but reported misconceptions about safety and the need for prior education, which is a close parallel to this study perception and knowledge findings [11]. Chagwena et al. similarly reported that acceptability among health workers in Zimbabwe correlated with knowledge level and professional cadre, again echoing this study's results that knowledge and context (facility) matter for acceptance [9]. International reviews and global snapshots further corroborate that donor milk banks are globally beneficial but that success depends on stakeholder education, culturally-sensitive messaging and robust safety/quality systems [4].

This study suggests several avenues for further research. Qualitative studies (focus groups and in-depth interviews) with nurses, facility managers, religious leaders and mothers would unpack the specific cultural, religious and logistical concerns hinted at in the quantitative data, particularly the reasons for greater acceptance among older nurses and the facility-level differences observed [20]. Implementation research and pilot studies are needed to evaluate how targeted education and a clear safety/traceability protocol change nurses' knowledge, perceptions and willingness to support milk banks in practice; such pilot implementations should measure downstream outcomes (uptake by families, neonatal morbidity/mortality, breastfeeding duration) as well as cost-effectiveness.

Given the affordability worries raised by respondents, economic analyses to model different financing scenarios (government subsidy, insurance coverage, fee-for-service with means testing) would help policy makers choose sustainable options.

Finally, longitudinal studies following cohorts of nurses before and after structured training and before/after a pilot milk bank launch would provide stronger causal evidence about the effectiveness of educational and policy interventions.

The study has limitations that should be acknowledged when interpreting the results. The cross-sectional design limits causal inference and captures attitudes at a single time point; social desirability bias may have inflated expressed acceptability among a professional sample who recognize the clinical value of donor milk. Finally, while the narrow

confidence intervals suggest precision for many estimates, higher standard deviations on certain items (e.g., definition of milk banking) indicate heterogeneity that warrants qualitative follow-up.

In conclusion, nurses in Bono regional hospitals demonstrate conditional readiness to support breastmilk donation and banking: practical clinical knowledge and favourable acceptability exist alongside conceptual gaps and concerns about cost and residual risk. This profile points to a feasible pathway "from ward to policy": start with targeted education and facility-level pilots (with robust safety protocols and transparent financing), use early success and local champions to build public trust, and couple implementation with operational research on cost, uptake and health outcomes. Doing so would align Ghana with global good practice and could help reduce neonatal morbidity and mortality where mothers cannot supply sufficient milk.

## Conclusion

This study assessed nurses' knowledge, perceptions, acceptability of breast milk donation and the association between sociodemographic characters and acceptability of breastmilk donation and banking in Bono regional hospitals, Ghana. This was to help provide evidence to inform policy development in Ghana. The findings reveal that, while nurses demonstrated reasonable knowledge of the practical health benefits of donor human milk such as its role in reducing morbidity and mortality among preterm and orphaned infants,' significant gaps remain in conceptual understanding, awareness of information sources, and the broader socio-cultural implications of milk banking. Perceptions were neutral, particularly regarding the safety and clinical benefits of donor milk, though concerns about affordability and residual disease risk highlight areas requiring further education and policy clarification. Encouragingly,

acceptability levels were high, with many nurses expressing willingness to support, donate, or encourage donation to milk banks, indicating readiness to embrace the intervention when adequate safeguards are in place. Socio-demographic associations, particularly age, place of work, and religion, show the importance of tailoring educational and advocacy strategies to different nurse groups and community contexts.

In moving 'from ward to policy,' this study concludes that the establishment of donor breast milk banks in Ghana is both feasible and potentially impactful but will require deliberate investments in nurse education, public sensitization, culturally sensitive engagement with religious leaders, and transparent frameworks for safety and financing.

## Ethical Approval

The study protocol was reviewed and approved by the Committee on Human Research, Publications and Ethics (CHRPE) of the Kwame Nkrumah University of Science and Technology (KNUST). Ethical approval was obtained prior to data collection to ensure that the study adhered to established ethical standards for research involving human participants. The approval process ensured that participants' rights, confidentiality, and welfare were protected throughout the study. Informed consent was obtained from all participants before their inclusion, and participation was entirely voluntary, with the option to withdraw at any stage without any consequence.

## Conflict of Interest

There is no conflict of interest to be declared.

## Data Availability

The data used for generating the result of this study may be made available from the corresponding author upon request and with permission from the institutions.

## Authors' Contribution

| Author | Contribution |
|---|---|
| Bennin Juabie Douri (Lead author) | • Conducted the primary research, including data collection, analysis, and interpretation. <br> • Drafted the manuscript, integrating feedback from other authors. <br> • Coordinated the revision process and finalized the article for submission. <br> • Provided expertise in aspects like; conceptual framework of the study and review of theories related to the study. <br> • Drafted ethical clearance protocol and all cover letters. <br> • Assisted with drafting the study data collection tool. <br> • Assisted with data collection. |
| Philip Teg-Nefaah Tabong | • Provided overall guidance and support throughout the research work. <br> • Provided critical feedback and intellectual inputs throughout the research process, including reviewing and revising the manuscript. <br> • Ensured the research adhered to ethical guidelines and institutional protocols. |
| Ankamah Ababio Christian | • Assisted with data collection and analysis (Descriptive and inferential statistics). <br> • Helped drafted sections of the manuscript, particularly related to the study methodology and results. <br> • Assisted with the draft of the study data collection tool. |

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