



BREAST MILK AND HAND HYGIENE PRACTICES AMONG BREASTFEEDING MOTHERS IN TERTIARY HEALTH INSTITUTIONS IN ABAKALIKI, EBONYI STATE SOUTH-EAST NIGERIA.

Uzochukwuamaka Blessed Ogeh¹ and Faith Chinaemerem Diorgu²

¹Department of Nursing Science, African Centre of Excellence for Public Health and Toxicological Research, University of Port Harcourt, Rivers State, Nigeria.

Email: ogehblessedu@gmail.com

²Department of Nursing Science, African Centre of Excellence for Public Health and Toxicological Research, University of Port Harcourt, Rivers State, Nigeria.

Email: faith.diorgu@uniport.edu.ng

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ABSTRACT: *Introduction:* Breast milk and hand hygiene are very important aspect for breastfeeding mothers. This is because of the role breast milk plays in the early stage of development of the infant. Though breast milk is very essential for infants, its quality can be compromised when proper hygiene practices are not observed by the breastfeeding mothers. Therefore, this study is aimed at determining the knowledge and practices of breast milk and hand hygiene among breastfeeding mothers in tertiary health institutions in Abakaliki, Ebonyi State, Nigeria. *Method:* The study adopted a cross-sectional descriptive design with a purposive sampling method to select 215 breastfeeding mothers who visited two tertiary health institutions for immunization. Data among were analyzed. Ethical approval and permission were obtained from the participating hospitals and University of Port Harcourt Ethics Committee, the institution the author affiliates. *Result:* The result revealed that 71.3% and 75.3% had good knowledge of breast milk and hand hygiene while 2.3% and 1.4% had poor knowledge. The study noted that 58.1% and 60.9% of the breastfeeding mothers practices breast milk and hand hygiene respectively while 21.4% and 9.8% had poor practice. The knowledge of breast milk and hand hygiene was significantly associated with practices of breast milk and hand hygiene. The result further revealed that only knowledge of breast milk hygiene was significantly associated with parity while knowledge of hand hygiene, practices of breast milk and hand hygiene was not significantly associated with parity. *Conclusion:* Though there is high knowledge of breast milk and hand hygiene among the breastfeeding mothers but the knowledge did not reflect with the practice. There is therefore a need for continuous education of the breastfeeding mothers on the practice of milk and hand hygiene and its importance to the growing infants.

KEYWORDS: Hygiene, Breast milk, Hand hygiene, Practice, Breastfeeding.



INTRODUCTION

Hygiene could be said to be the practice of keeping oneself, one's living environment as well as working environment clean in order to prevent illness and disease (Asekun-Olarinmoye, 2022, Berhanu, 2022). Hygiene could also refer to conditions and practices that help to maintain health and prevent the spread of diseases (UNICEF, 2016). One important aspect of hygiene especially for breastfeeding mothers is hand hygiene and breast milk hygiene. This is because of the significant function of breast milk within the earlier stage of the infant and the relationship this breast milk has with hand hygiene. Considering the value of breast milk which is noted to be complete and nutritionally balanced source of nutrients for infants and its protective nature against infections and diseases (Kim, and Yi, 2020), the quality and safety of breast milk can be compromised if good personal hygiene habits are not followed by breastfeeding mothers or any other caregiver handling the breast milk (Bankole, 2023). It has been evident that breast milk and hand hygiene is very economical and cost-effective way of preventing infections, hence holding strong prospect for reducing the prevalence of infections and infant mortality. (Ogunfowora, Ogunlesi & Oba-Daini, 2020, WHO, 2019).

One major aspect of hand hygiene is hand washing. The World Health Organization (2009) outlined the correct way to wash your hands is in twelve steps: wet them with water, saturate all hand surfaces with soap, rub hands palm to palm, right palm over left dorsum with interlaced fingers, rotate hands back and forth while rubbing the clasped fingers on your right palm in your left palm and vice versa, After using a single-use towel to rinse your hands, use the towel to turn off the faucet. It has been established to be central to preventing the spread of infectious diseases (like diarrhea) in the home and the everyday life settings (Fisk, 2010). In many of lower income and under-developed countries, the primary cause of death for children is diarrhea disease. However, Lenja et al., (2016) in their review of data gathered from several research showed that about 42%-47% reduction in diarrhea can occur when hand washing with the soap and water is introduced into a community especially to the breastfeeding mothers.

Hand hygiene is a critical aspect of ensuring the safety and cleanliness of breast milk (Khan, 2021). The hands of breastfeeding mothers can harbor harmful microbes such as bacteria, viruses, and parasites that can spread to infant during breastfeeding. Inadequate hand hygiene practices can increase the risk of infection and illness in the mother and the child.

(Taddese et al., 2020). Similarly, maintaining proper breast milk hygiene is essential to prevent contamination. Several ways breast milk could be contaminated include: expression, storage, and handling. Environmental contaminants, such as bacteria and toxins, can access and contaminate breast milk if breast pump equipment and containers are not adequately cleaned and sterilize. Contaminated breast milk can pose great health risks to the infant and may lead to gastrointestinal infections, respiratory illnesses, or possibly other adverse health outcomes (Abdulla et al., 2009).

Available literature has showed that in Nigeria, diarrhea prevalence is about 18.8% and it ranks among the greatest in Sub-Saharan Africa. Over 16% of child deaths in Nigeria is believed to be linked to diarrhea and an estimated 150,000 deaths mainly amongst children under five especially infants occur annually due to diseases connected to poor sanitation and hygiene practices (Okafor et al, 2022). Sustainable Development Goals (SDGs) developed strategies to reduce the number of under-five children deaths by 10 million between 2017 and 2030 (UNICEF, 2016). To achieve this goal, enhancing the hygiene especially the hand hygiene of



the breastfeeding mothers as well as the comprehensive hygiene of the children is essential. However, good hand hygiene is not usually practiced in low-income countries like Nigeria and this may be due poverty, ignorance and poor water supply.

Understanding the current hand and breast milk hygiene practices among breastfeeding mothers is crucial for promoting infant health and ensuring the safety of breast milk. By identifying the gaps in knowledge and practice, advocacy and interventions can be developed to educate and support breastfeeding mothers in adopting appropriate hygiene measures. Such advocacy and interventions can include educational campaigns, training programmes, and the provision of resources as well as providing tools to facilitate proper hand hygiene and breast milk handling. This study is very expedient because of the paucity of studies on breast milk and hand hygiene practices among breastfeeding mothers, hence this will not only fill a literature gap but will as well help both breastfeeding mothers, caregivers and health workers in promoting adequate hygiene that will in-turn foster adequate development and growth of infants.

LITERATURE/THEORETICAL UNDERPINNING:

All mammals have breasts, which are mammary glands that secrete milk. The human breast comprises of tissues, lobes, and glands as well as internal and external structures. The glandular tissue within the lobes contains tiny, milk-producing glands at their ends. The areola is located in its center (Gaskin, 2017). Breast does not develop fully during the adolescent stage and they are due to puberty-related changes, but during pregnancy, they are fully developed (Alex et al., 2020). The breast undergoes anatomical and physiological changes during pregnancy in order to get ready for breastfeeding. These levels drop during the third trimester and immediately after delivery, setting stage for production of milk and a last let-down to facilitate breastfeeding. The areola darkens, the breast enlarges, and the Montgomery glands become more noticeable during most pregnancies. When a decrease in prolactin results in the end of milk production, post-lactational involution takes place (Alex et al., 2020). Lactation is the process by which the mammary glands of a postpartum female breast produce and secrete milk in response to a baby suckling at the nipple. Breast milk gives the baby the most desired nourishment and passive immunity (Pillay, 2019). Breastfeeding has a lot of benefits to the infants. It is expedient that every mother and caregiver to understand the method of processing and preservation of breast milk in order to successfully breastfeed. Also it was observed that some women store their breast milk according to established guidelines, but from studies, 12% of them heat it in a microwave, and 17% cleaned the bottle teeth with only water before using it (Labiner, 2013). These actions most time reduce the breast milk qualities and increase risk of infection. Taking daily baths, changing bra and light cotton dress and cleansing the breasts are important area of good breast milk hygiene during breast feeding (Kotlen, 2021). Another important aspect of hygiene for breastfeeding mothers is hand hygiene. Proper hand hygiene involves washing hands with soap and water or using an alcohol-based hand sanitizer (WHO, 2019). Ogunfowora et al., (2022) discovered from their work that 94% of the women had access to water at home, 48.3% washed their hands with soap and water, 79.8% had received counseling regarding hand washing as part of their prenatal care. Knowledge of breast milk and hand hygiene helps mothers to practice and parity has little or no influence. Ukegbu et al., (2011) discovered in its research that breast milk hygiene is not significantly related to parity of the mothers.



Theoretical Underpinning: Health Belief Model (HBM) was used for the study. HBM is a behavioral health theory used in professional nursing practice. It was developed in the 1950s by social psychologists Hochbaum, Rosenstock and others, who were working at the U.S. Public Health Service to explain the failure of people participating in programs to prevent and detect disease. The Elements of the HBM assumes that decision-making (a person's behaviors) occurs when the following elements (a person's ideas) take place: Perceived Susceptibility, Perceived susceptibility (often called perceived severity), Perceived Threat, Perceived benefits vs. perceived barriers (Subedi, Filho & Adedeji, 2023).

Application of Health Belief Model (HBM) to the study.

The health Belief Model predicts that a specific health behavior is more or less likely based on an individual's perceptions of the disease severity and personal susceptibility to the disease combined to that behavior. First is the perceived susceptibility of infants contracting diseases, children that are under five years of age are vulnerable to contract infections and diseases due to improper hygiene because their immune system is weak at early stage. Secondly, the perceived severity of the disease by parent if an infant contract an illness like diarrhoe and its consequences, so the pressure to adopt a healthy measure that is practice of breast milk and hand hygiene becomes necessary. Thirdly, the perceived benefits are important factor that can determine the course of action towards health issues. The mother weighs the benefits or otherwise embarking on an action including health care related issues. The benefit is that it will prevent or stop the infant from being at risk of contracting serious infection. Fourthly, the perceived barriers that could hinder breast feeding mothers from practicing breast milk and hand hygiene are numerous and these include lack of water and soap, lack of time to wash hands and clean the breast, lack of awareness etc.

Next is the Cues of Action that could motivate the breast feeding mothers to practice breast milk and hand hygiene. This includes both the internal and external force that will trigger the individual to change.

METHODOLOGY

$n = \frac{Z_{1-\alpha/2}^2 P(1-P)}{d^2}$ This is a hospital based cross-sectional descriptive survey. The study was conducted in tertiary hospitals in a low resource country. The study investigated hand and milk hygiene knowledge and practices by two hundred and fifteen (215) breastfeeding mothers of infants aged between 0 and 12 months attending the immunization clinic/children welfare clinic.

$$n_f = \frac{n}{1 + \frac{n}{N}} \quad n_h = \frac{n_f N_h}{N}$$

The breast milk and hand hygiene knowledge and practices were classified as "poor", "fair" and "good" using the quartile of the scoring of the question items on the knowledge and practice. Participants whose scores were within the first quartile were considered to have poor knowledge, those whose score is within the second quartile were considered to have fair



knowledge while those whose scores were at third quartile and above are considered to have good knowledge. In the same vein, the practice of breast milk and hand hygiene were classified into “poor”, “good” and “very good” based on quartile of the scoring of the questions items on practice. Participants whose score were within the first quartile had poor practice, those whose scores are within the second quartile have good practice while those whose scores were at third quartile and above had very good practice.

Method of Data Analysis: Summary statistics (frequency and percentage) were derived for socio-demographic variables as well as level of knowledge and practice of breast milk and hand hygiene and parity. Fisher’s exact test (which was adopted due to the violation of assumptions of Chi-square) was used to determine the relationship (association) between the variables of interest level of knowledge and practice of breast milk and hand hygiene and parity at 5% level of significance.

RESULTS

Table 1: Socio-demographic characteristics of the study participants

Variables	Frequency (n=215)	Percent (%)
Age(years)		
<20	6	2.8
20-29	117	54.4
30-39	78	36.3
40-49	14	6.5
Residence		
Rural	35	16.3
Urban	180	83.7
Family Type		
Monogamy	202	94.0
Polygamy	13	6.0
Level of Education		
No Formal Education	13	6.0
Primary	6	2.8
Secondary	29	13.5
Tertiary	167	77.7
Employment Status		
Civil/Public Servant	98	45.6
Artisans/Traders	40	18.6
Unemployed/Housewife/Student	62	28.8
Farmers	4	1.9
Others	11	5.1
Marital Status		
Married	201	93.5
Single	9	4.2
Separated/Divorced/Widow	5	2.3



Religion		
Christian	207	96.3
Others	8	3.7

The result as display in Table 1 shows that majority of the participants (54.4%) are within the age of 20-29 years, and residing in urban region (83.7%). 94% of the participants had monogamous family with 77.7% having tertiary level of education. Greater proportions of the participants (45.6%) are civil/public servants with 93.5% being currently married while 96.3% are Christian. The percentage distribution of the parity status of the study participants shows that majority (42.3%) of the participants are Multi-parious (that is they have had between 2-4 live births) while those with only one live birth (Primi-parious) are 33.5% of the study participants with the remaining 24.2% being those with more than 4 live births (Grandmulti-parious).

Table 2: Level of knowledge of breast milk and hand hygiene among study participants

Level of Knowledge	Frequency (n=215)	Percent (%)
Breast milk hygiene		
Poor	5	2.30
Fair	57	26.50
Good	153	71.20
Hand hygiene		
Poor	3	1.40
Fair	50	23.30
Good	162	75.30

The result in Table 2 shows the level of knowledge of breast milk and hand hygiene by the breastfeeding mothers. From the result it was revealed that 2.30% and 1.40% of the participants had poor knowledge breast milk and hand hygiene respectively while 71.20% and 75.30% had a good knowledge of breast milk and hand hygiene respectively. In all, greater proportion of the participants had a good knowledge.

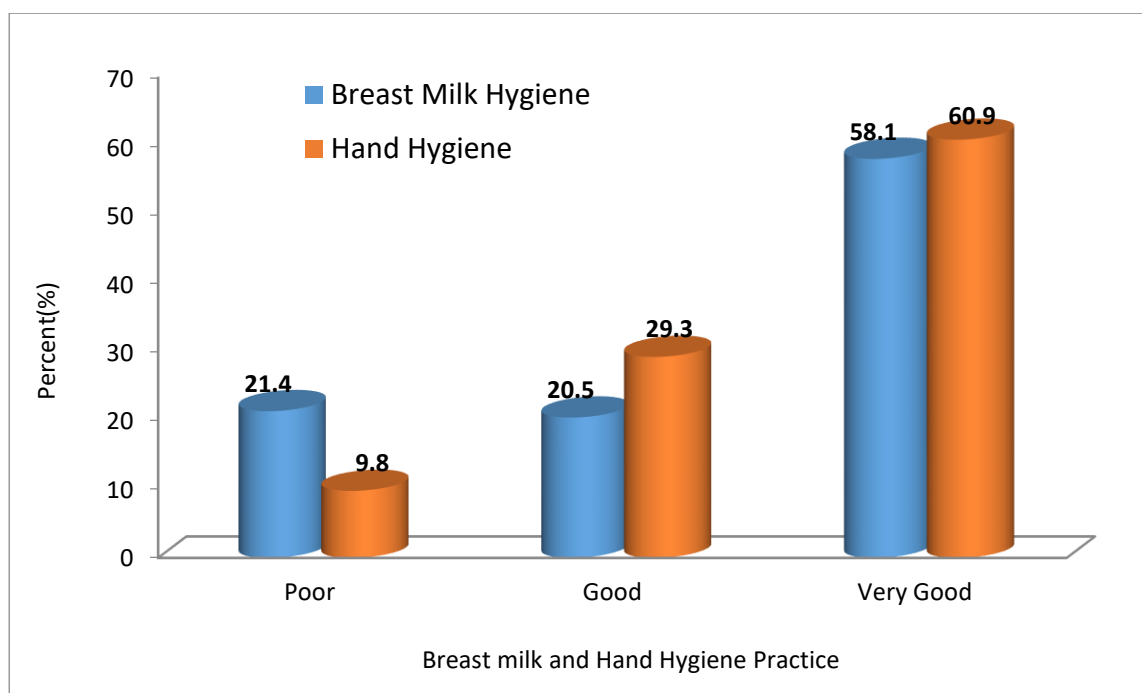


Figure 1: Practice of breast milk and hand hygiene among study participants

The figure shows the distributions of the extend of practice of breast milk and hand hygiene among the study participants. The result revealed that 58.10% of the study participants had a very good practice of breast milk hygiene while 60.90% had a very good practice of hand hygiene. The ratio of poor practice of breast milk hygiene to hand hygiene is 46:21.

Table 3: Analysis of relationship between parity, knowledge and practice of hand and breast milk hygiene

Variable	Parity			Fisher's Exact	p-value
	Primi-parity (n=72) n(%)	Multi-parity (n=91) n(%)	Grand multi-parity (n=52) n(%)		
Knowledge of breast milk hygiene					
Poor	0(0.00)	2(2.2)	3(5.8)	10.280	0.021
Fair	13(18.1)	25(27.5)	19(36.5)		
Good	59(81.9)	64(70.3)	30(57.7)		
Knowledge of hand hygiene					
Poor	0(0.0)	1(1.1)	2(3.8)	3.260	0.511
Fair	17(23.6)	23(25.3)	10(19.2)		
Good	55(76.4)	67(73.6)	40(76.9)		
Practice of breast milk hygiene					
Poor	13(18.1)	20(22.0)	13(25.0)	1.237 ⁺	0.872
Good	14(19.4)	20(22.0)	10(19.2)		



Very Good	45(62.5)	51(56.0)	29(55.8)		
Practice of hand hygiene					
Poor	3(4.2)	11(12.1)	7(13.5)		
Good	22(30.6)	27(29.7)	14(26.9)	4.030 ⁺	0.402
Very Good	47(65.3)	53(58.2)	31(59.6)		

p<0.05 indicates significance, + = chi-square.

The result of the analysis of the relationship between parity of the breastfeeding mothers under study (participants) and knowledge as well as practice of both breast milk hygiene and hand hygiene. The result shows that parity was only significantly (Fisher's Exact = 10.280, p=0.021) related to knowledge of breast milk hygiene. This indicates that except the knowledge of breast milk hygiene; knowledge of hand hygiene, practice of breast milk hygiene and practice of hand hygiene is not significantly associated with parity. Contrary to assume obvious, an inverse relationship was observed between parity and knowledge of breast milk hygiene where those with lesser parity had better knowledge than their counterpart with higher parity.

DISCUSSION

The result of the analysis of the responses on question items on knowledge of breast milk an. The result suggest good knowledge of breast milk and hand hygiene by the breastfeeding mothers. The result further indicated that on this findings was further collaborated corresponds with the finding by Ogunfowora , Ogunlesi & Oba-Daini (2020) were majority of the mothers received counseling about hand washing as part of antenatal care and less than half of the practice it. Also it was found that most of the mothers had adequate knowledge in the practices of personal hygiene and sanitation (Majumda, 2020).

Our findings further showed that there are significant relationship between knowledge of hand hygiene and the socio demographic characteristics of the study participants shown in Table 10. In particular, that level of education (Fisher's exact = 17.340, p=0.005) and marital status (Fisher's exact = 12.056, p=0.017) are significantly (p<0.05) related (associated) to knowledge of hand hygiene. In table 9, showing the relationships between breast milk hygiene and socio-demographics characteristics, it was revealed that age, level of education and employment status are significantly related to breast milk hygiene. That is level of knowledge of hand hygiene differ significantly among different categories of levels of education and marital status. Majority of the participants with fair knowledge (82%) and good knowledge (77.2%) are those with tertiary level of education this agrees with Asekun et al (2014) that those with higher education had better knowledge and practice of hand washing (hygiene).

This study assessed the practice of breast milk and hand hygiene among breast feeding mothers as shown in table 3. The findings from the study showed that majority of the participants' responses on questions items on breast milk and hand hygiene practice are on "often" scale. This suggest relatively a good practice of breast milk and hand hygiene among the study participants to some extent. The result further revealed that the least practice among the study participants is the expression of breast milk. The result is in concordance with the findings of Kotowski (2020) who however observed that alternative feeds during working or call hours included expressed breast milk in 34.4% and infant formula in 21.9%. They further showed



that feeding bottle was the major method (77.4%) for feeding these alternatives compared to the result of this study that expression of breast milk is the least practice while the commonest practice is the change of cloth and bra daily. The result also agreed with Kotlen (2021) who emphasizes that daily showers or baths and cleansing of breasts are vital aspects of excellent hygiene during breast feeding. Deck (2019) opined that it is critical to change wears and bra daily and also wear loose clothes for improved airflow, minimize sweating and reduce bacteria growth. Breast feeding moms were advised for years not to wash their breasts with soap because it would cause the region around the nipple to become dry. However, this shouldn't be a problem if you use a light, hydrating soap and thoroughly rinse it off.

Also the result on the extend of practice of breast milk and hand hygiene among the study participants revealed that 58.1% of the study participants had a very good practice of breast milk hygiene while 60.9% had a very good practice of hand hygiene. The ratio of poor practice of breast milk hygiene to hand hygiene is 46:21.

There is a relationship between the knowledge and practice of breast milk hygiene among the study participants. The correlation result shows that majority of participants (58.8%) with good knowledge of breast milk hygiene had a very good practice of breast milk hygiene. The result further shows that there is a significant relationship ($p < 0.05$) between both variables indicating that practice of breast milk hygiene is associated with the knowledge of breast milk hygiene among the study participants. This finding was similar to that of Majumda, (2020) who found out that most of the mothers that had adequate knowledge about the importance of colostrum and exclusive breastfeeding and appropriate hygienic infant feeding has a good practices of breast milk hygiene and sanitation as breast feeding mothers. Likewise, the result of relationship between the knowledge and practice of hand hygiene among the study participants revealed that about 65.4% of the participants with good knowledge of hand hygiene has very good practice of hand hygiene. The result shows an upward trend of practice as knowledge increases, hence, there is a significant relationship (Fisher's Exact = 13.236, $p = 0.005$) between knowledge and practice of hand hygiene. Ogunfowora, (2022) observed that women who had health education on hand washing during antenatal usually practices good hand hygiene. Additionally, the measure of relationship between the practice of breast milk hygiene and socio-demographic characteristics of the study participants result revealed that practice of breast milk hygiene is significantly ($p < 0.05$) related with level of education and religion. It is evident here that majority of the participants with very good practice of breast milk hygiene are those who had tertiary level of education. This study agrees with the work of Asekum et al (2014) who observed that though that overall respondents had good knowledge of hand washing but their educational status and religion were found to influence degree of knowledge of hand washing ($p = 0.01$ respectively with higher education and Christianity positively impacting knowledge of hand washing). Similarly, the result of the measure of relationship between the practice of hand hygiene and socio-demographic characteristics of the study participants indicated that age (Fisher's exact = 13.419, $p = 0.023$), residence (Fisher's = 7.329, $p = 0.022$) and Employment status (Fisher's exact = 27.922, $p < 0.001$) are significantly related to practice of hand hygiene. Majority of the participants (57.3%) with good practice of hand hygiene are within 20-29 years. The result of the responses on question items on practice of breast milk hygiene indicated that majority of the breast feeding mothers practices breast milk occasionally and often. The result shows that 21.4%, 20.5% and 58.1% of the participants have respectively poor, good and very good practice of breast milk hygiene.



It was observed that there is fair hygienic practice, therefore to enhance practice of breast milk and hand hygiene midwives and other health workers should give adequate health education and awareness on the importance of proper hand washing practices and personal hygiene during breast feeding and baby care.

This study assessed the influence of parity in the practice of breast milk and hand hygiene among breast feeding mothers, as the result is shown in Table 8. The percentage distribution of the parity status of the study participants shows that majority (42.3%) of the participants are Multi-parious (that is they have had between 2-4 live births) while those with only one live birth (Primi-parious) are 33.5% of the study participants with the remaining 24.2% being those with more than 4 live births. The result of the analysis of the relationship between parity of the breastfeeding mothers under study (participants) and knowledge as well as practice of both breast milk hygiene and hand hygiene shows that parity was only significantly (Fisher's Exact = 10.280, $p=0.021$) related to knowledge of breast milk hygiene. This indicates that except the knowledge of breast milk hygiene; knowledge of hand hygiene, practice of breast milk hygiene and practice of hand hygiene is not significantly associated with parity. Contrary to assume obvious, an inverse relationship was observed between parity and knowledge of breast milk hygiene where those with lesser parity had better knowledge than their counterpart with higher parity. This could be because most mothers with higher parity tend to engage in late antenatal registration, hence various updated health information and education usually elude most of them. This findings corroborated with the result by who discovered in its research that breast milk hygiene is not significantly related to parity of the mothers Ukegbu et al., (2011). They state that breast milk hygiene among breastfeeding mothers of differs parity are the same.

IMPLICATION TO PRACTICE

- Breastfeeding has been generally recognized to be the best food for infants, but could cause diarrhea when handled un-hygienically. This will in-turn impacts negatively on growth and development of the infants.
- Sustainable Development Goals (SDGs) developed strategies to reduce the number of under-5 children deaths by 10 million between 2017 and 2030. Improving hand hygiene of breastfeeding mothers and children is essential to achieve it.
- Therefore, this study was carried out among breastfeeding mothers to determine their knowledge and practices of breast milk hygiene and hand hygiene during breastfeeding period.

Contributions to knowledge

- The awareness of breast milk and hand hygiene among breast feeding mothers is yielding result as evident in the high knowledge level observed in the study.
- Discovery that there is low practice vis-à-vis the knowledge of breast milk and hand hygiene among the breast feeding mothers.
- Maternal parity and certain socio-demographic characteristics are correlates of knowledge and practice of breast milk and hand hygiene.



CONCLUSION

Based on the findings from the study, the following conclusions were made: majority of the breastfeeding mothers had good knowledge of breast milk and hand hygiene and practice breast milk and hand hygiene but the level of knowledge does not commensurate to the practice. Therefore there is a need for continuous education for breastfeeding mothers on the practice of breast milk and hand hygiene, as well as its importance to the growing infants. Also more research is needed on the subject involving more facilities and communities.

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