

Original Article**Cup Feeding Practices among Care Givers in a Neonatal Intensive Care Unit****Adenike Ayobola Olaogun, PhD RN RM RPHN**

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Abstract

Background: The WHO recommends that infants have to be exclusively breastfed for the first six months. Sometimes breastfeeding is not achievable, and then alternative methods recommended by WHO/UNICEF as cup feeding must be used. Cup feeding is increasingly being used in developing nations.

Objectives: The study was conducted to assess the cup feeding practices of caregivers feeding neonates at a neonatal intensive care unit.

Methods: A quantitative descriptive design was adopted. Respondents were mothers of 45 neonates selected by purposive sampling. The study instrument comprised a self-administered structured questionnaire and an observation check-list developed from the WHO guidelines on cup feeding. This was used in assessing 36 cup feeding sessions of care givers.

Results: Majority (93%) of the neonates were cup fed according to the hospital's policy. Observation of the care givers on cup feeding practice revealed that very few (16.7%) of them performed hand washing accurately, 55.6% positioned the neonate correctly, just 30.6% positioned the cup properly on the neonates' lips, and only 41.7% assessed the new born properly to determine its health status prior to initiating cup feeding. All the caregivers ensured that the expressed milk or milk formula was poured at the right temperature into the cup but only 2.8% burped the neonate during feeding while 19.4% burped after feeding. A significant difference was found in the practice of cup feeding between the nurses and other caregivers who are non-medical practitioners. ($\chi^2=6.703$, df= 2 and P=0.035).

Conclusion: This study revealed that though nurses exhibited better practice of cup feeding than other care givers, there was still a general poor practice by all care givers. This is not expected in a baby friendly facility as the one used for the study where cup feeding is used as the alternative to breastfeeding. Hence, there is a need to retrain nurses and educate mothers on cup feeding practices.

Key words: Cup feeding practices, Neonates, Care givers.

Background

The provision of breast milk is very important in the nutrition of preterm and term infants as it provides unique health benefits to the mother and neonate (Oddy, 2002; and Al-Sahab, Feldman, Macpherson, Ohlsson, & Tamim, 2010). The ideal way for infants to receive breast milk is through suckling at the breast. They must learn to attach and suckle properly at the breast during the first few days of life in order to breastfeed successfully (Flint, New, & Davies, 2009). Evidence has shown that many mothers still breastfeed their neonates but sometimes, breastfeeding may not be possible for many reasons (Flint, New, & Davies, 2009). Then, alternative methods of feeding are required (Oddy, 2002; and Abouelfetoh, Dowling, Dabash, Elguindy & Seoud, 2008). Feeding bottles and nasogastric tubes have been used globally but recently, cup feeding has been recommended as a safe alternative in an attempt to improve breastfeeding rates (UNICEF, 2012). Reports have shown that there was increased prevalence of breastfeeding when bottle feeding was replaced by cup feeding for preterm infants as well as for full term infants (Flint, New &, Davies, 2009; Abouelfetoh, Dowling, Dabash, Elguindy & Seoud, 2008; and Lang, Lawrence, & Orme, 1994). According to WHO/UNICEF, exposure to artificial nipples is believed to contribute to breastfeeding problems and early weaning. Reports have shown that artificial nipples are strongly associated with breastfeeding problems (Howard, Howard, Lanphear, Eberly, deBlieck, Oakes, & Lawrence, 2003; Kliethermes, Cross, Lanese, Johnson, & Simon, 1999; Righard 1998, Schubiger, Schwarz, & Tonz, 1997; and Neifert, Lawrence, Seacat, 1995).

This problem has been explained by a phenomenon called nipple confusion. It is on this premise that WHO/UNICEF recommended the avoidance of bottle feeding and that cup feeding should be used as method of supplementation for term and preterm infants. Cup feeding as an alternative method of supplemental feeding for both term and preterm infants has therefore gained popularity over the years. However, Flint, New, & Davies,(2007) in a Cochrane review of four studies, submitted that cup feeding cannot be

recommended over bottle feeding as a supplement to breastfeeding as it does not confers any significant benefit in maintaining breastfeeding beyond hospital discharge and has been attributed to unacceptable consequence of a longer stay in hospital. This view is also supported by Collins, Makrides, Gillis, & McPhee (2008). However, in the where this study was carried out, cup feeding had been adopted over all other methods of alternative to direct breast feeding of neonates.

Some authors have also reported that infants are at risk of aspiration pneumonia when improper technique of cup feeding is used. This most often results when the milk is being 'poured into' the infants' mouth rather than allowing the infant to 'lap' or sip the milk (Lang, Lawrence, & Orme, 1994). Other potential risks associated with cup feeding include physiological instability; bradycardia, apnea, low oxygen saturation, choking and poor weight gain (Howard, Howard, Lanphear, et al., 2003; and Freer, 1999). WHO/UNICEF baby friendly initiative in their general assembly in 1998 however, specifically proscribed the use of pacifier and bottle feeding citing their avoidance as important to the successful establishment of breast feeding. These they say can result in extended hospitalization and additional cost of care (Flint, New, & Davies, 2003). It is therefore important to assess whether care givers including nurses are complying with the WHO/UNICEF child friendly initiative laid down guidelines on cup feeding in order to reduce or prevent these possible negative effects of cup feeding. The study's aim was to assess care givers' practice of cup feeding of neonates.

Hypothesis

There is no difference in the practice of cup feeding between the nurses and other caregivers

Methodology

Design

A quantitative descriptive design was adopted. This design is appropriate as it allows us to describe how care givers cup feed neonates in the NICU. This is done by distributing questionnaire to the respondents and observing care givers cup feeding neonates.

Study Setting/ Sampling technique

The study was conducted at the Neonatal Intensive Care Unit (NICU) of the Obafemi Awolowo University Teaching Hospital Complex (OAUTHC), Ile-Ife, South west Nigeria. OAUTHC is a baby friendly hospital where all the nurses in the NICU were trained on how to cup feed and are also expected to train all mothers and caregiver that have their baby admitted into the NICU, how to cup feed. The hospital adopted cup feeding as an alternative to direct breast feeding. The babies are fed on expressed breast milk except in cases where the mother is unable to express. The NICU contains twenty four baby cots. The average admission per month was 38 neonates. At the time of study, it was manned by 17 nurses (on shift duties) and two paediatricians. A purposive sampling technique was used and the inclusion criteria are that, neonates must not be less than 30 weeks gestation at birth and must be clinically stable (having no conditions that would affect feeding, such as respiratory distress or oxygen dependency and any other medical conditions that are capable of affecting cup feeding). A total of forty five neonates were thus selected.

Data Collection

The instruments used for the study were; (i) a self-administered structured questionnaire adapted from Synovate Research Reinvented Global Opinion Panel (2007). This questionnaire was given to mothers of the neonates selected as sample and (ii) an observation check list with 17 activities developed from the WHO guidelines (Lang, Lawrence, & Orme, 1994; WHO, 1997; and Samuel, 1998) on cup feeding. This checklist was used in assessing cup feeding practice of care givers.

Thirty six cup feeding sessions were observed by one of the authors. The practice of cup feeding was measured on a three point scale- 1(not done), 2 (done but not correctly), and 3 (done correctly). The scores ranged from 17-51. It was further graded as: Good practice (41-51) representing 70% and above, Fair practice (34-40) representing 50 to 69% and Poor practice (33 and below) representing less than 50%. (Ijadunola, Ijadunola, Esimai, & Abiona, 2010).

One of the researchers made repeated visits to the ward to administer and retrieve questionnaires, and observe cup feeding practice of care givers feeding neonates of 30 weeks gestational age and above. A total of 45 questionnaires were administered and retrieved, while 36 cup feeding sessions were observed over a four month period.

Ethical Consideration;

Ethical approval for the study was taken from the ethical and research committee of the hospital while informed consent was obtained from each respondent. Anonymity of the respondents was assured by not including their names on the questionnaire, nor any details that can be traceable to the clients.

Data generated were stored with pass word in a folder on one of the researcher's computer to ensure confidentiality of respondent's information. Face and content validity of the instruments were ascertained by experts in the field of nursing, and maternal and child health for expert opinion and scrutiny. Each item was checked for its relevancy and appropriateness. The reliability of the questionnaire was ascertained through test re-test method.

Right of any of the respondents to withdraw at any stage of the research was given and they were assured that it would not in any way interfere with their treatment regimen. This study does not offer any immediate benefit to the respondents, they were not given any money and there was no risk inherent in participation. Result however, will add to the body of knowledge on cup feeding which is essential to improve the practice of cup feeding among care providers.

Data Analysis

Data collected were fed into the SPSS software and analyzed with descriptive and inferential statistics. The observation checklist was coded as Correctly done (attract 3 marks), Done but not correctly done (attract 2 marks) and Not done (attract 1 mark). The scores obtained was further graded into Good practice, Fair practice and Poor practice

Results

Data was not available for the birth weight of the 9 neonates delivered at home. For those whose

data was available, the mean weight at birth was found to be 2.47 kg with SD \pm 0.78. Mean weight of the neonates at the time of data collection was found to be 2.52 kg with SD \pm 0.79. On the average the neonates had spent about eight days on the ward before having contact with the researcher.

Majority (89%, n = 40) of the neonates sucked directly from the breast before they were commenced on cup feeding, 4.4% (n = 2) had received bottle feeding while 6.7% (n = 3) had been tube-fed. Out of the neonates' that were breastfed prior to cup feeding only 17.5% (n = 8) of them had breastfeeding initiated in the first hour of birth. Majority (93.3%, n = 42) were cup fed because it was the hospital policy while the rest (6.7%, n = 3) were cup fed because their mothers were not available. By grouping, 77.8% (n = 35) of the neonates were cup-fed by nurses and neonates' mothers, 4.4% (n = 2) by nurses and other people apart from neonates' mothers while 17.8% (n = 8) were cup-fed by nurses alone.

In assessing the practice of cup feeding (table 1), only 16.7% performed hand washing accurately. Very few (5.6%) gathered all the utensils needed for cup feeding and less than half (41.7%) properly assessed to determine the condition of the new born prior to initiating cup feeding. All the caregivers poured expressed milk or milk formula at the right temperature into the cup. About half (55.6%) of them positioned the neonate correctly while 30.6% positioned the cup properly on the neonates' lips. Less than half (47.2%) took caution not to pour the milk too fast while 44.4% did monitor the flow of milk. Only 2.8% burped the neonate during feeding and 19.4% burped after feeding. Documenting after cup feeding the neonates was not done by any of the caregivers. However, nurses demonstrated a better practice of cup feeding than other care providers on neonatal feeding (figure 1). There was a significant difference in the practice of cup feeding between the nurses and other caregivers with $X^2=6.703$, df= 2 and P=0.035.

Discussion

The WHO and UNICEF, advocates ten steps to successful breastfeeding. Steps six and nine clearly state that formula supplementation and pacifier use, except when medically necessary, should be avoided. The hospital in which this study took place is a baby friendly hospital. It has a policy on the use of cup feeding as an alternative to breastfeeding. Therefore the majority of the neonates are cup fed. Marinelli, Burke and Dodd (2001) have reported that cup feeding is a safe alternative method for feeding neonates.

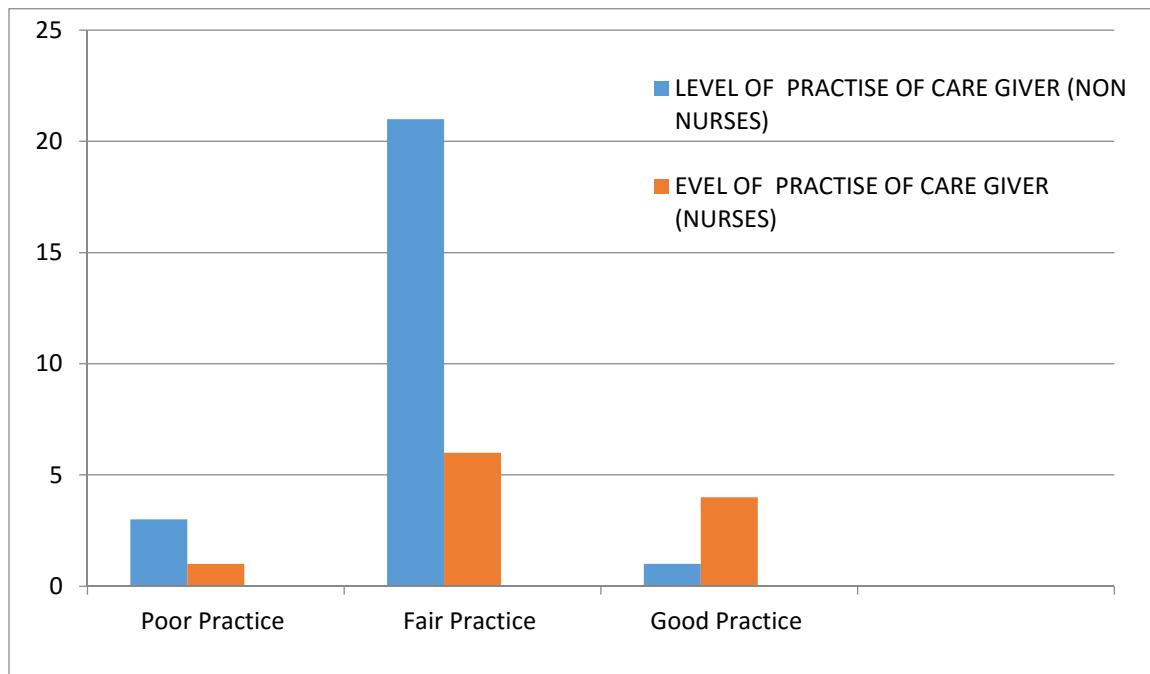
The first step in every procedure is hand washing. This significant aspect of the procedure was either not performed or was poorly done. Studies have linked health care providers' hands with infections in the NICU (Moolenaar, Crutcher, San Joaquin, et al., 2000; and Crivaro, Di Popolo, Caprio, et. al., 2009). Reports have also shown that there is low compliance with hand washing recommendations in many health institutions as was revealed in this study (Pittet, Hugonnet, Harbarth, et al., 2000; and Rosenthal, Guzman, & Safdar, 2005). Failure to comply with hand washing procedures is one of the factors attributed to high prevalence of neonatal and infant infections in NICU (Pittet, Hugonnet, Harbarth, et al., 2000). The low compliance with hand washing recommendation demonstrated in this study could expose these neonates to nosocomial infections. Lam, Lee & Lau (2004) emphasized that hand washing with soap and water was associated with significantly lower rates of neonatal mortality.

The position of the neonate and placement of the cup were also important in cup feeding. While some of the caregivers positioned the neonates properly, many did not position the cup properly on the lips of the neonates. The neonates should be swaddled to prevent them from using their hands to knock off the cup. The rim of the cup is placed slightly on the neonate's lower lip with the cup's edges touching the outer parts of the upper lip. This stimulates the rooting reflex and gives signal to the neonate that it is time to eat.

Table 1: Distribution of Caregivers by Cup Feeding Practices

S/ N	Activities	Not done	Done but not correctly	Done Correctly
1	Wash hands before the procedure	15 (41.7)	15 (41.7)	6 (16.7)
2	Gather equipment appropriately	6 (16.7)	28 (77.8)	2 (5.6)
3	Determine newborn state prior to initiating feeding	6 (16.7)	15 (41.7)	15 (41.7)
4	Use clean cup without lid, spout, or lip	7 (19.4)	3 (8.3)	26 (72.2)
5	Pour expressed milk at room temperature, or formula into cup	0(0.0)	0 (0.0)	36 (100.0)
6	Hold swaddled newborn upright or semi upright while supporting newborn's back, neck, and head	4 (11.1)	12 (33.3)	20 (55.6)
7	Hold cup to newborn's lip resting slightly on the lower lip with cup's edges touching outer parts of upper lip	5 (13.9)	20 (55.6)	11 (30.6)
8	Monitor for newborn signs of feeding readiness (i.e., increased alertness, opening mouth and eyes, and making movements with mouth and face)	2 (5.6)	14 (38.9)	20 (55.6)
9	Tip cup so that milk touches newborn's lips	4 (11.1)	10 (27.8)	22 (61.1)
10	Avoid pouring milk too fast	5 (13.9)	14 (38.9)	17 (47.2)
11	Monitor milk flow	3 (8.3)	17 (47.2)	16 (44.4)
12	Burp the newborn frequently during the feeding	33 (91.7)	2 (5.6)	1 (2.8)
13	Burp the newborn after the feeding	28 (77.8)	1 (2.8)	7 (19.4)
14	Make the newborn comfortable in his/her cot	0 (0.0)	4 (11.1)	32 (88.9)
15	Wash equipment	0 (0.0)	3 (8.3)	33 (91.7)
16	Store equipment appropriately	0 (0.0)	0 (0.0)	36 (100.0)
17	Document appropriately	34 (94.4)	2 (5.6)	0 (0.0)

Figure 1: Cup feeding Practice among Nurses and Non Nurses



The caregiver then tips the cup so that milk touches the lips and the neonate responds by lapping the milk. This prevents the milk from rushing into the mouth, thereby reducing aspiration. Cup fed neonate takes less volume of milk over more time than bottle fed neonates. Previous studies have emphasized that during cup feeding, the infants are more physiologically stable, have lower heart rates, higher oxygen saturation than bottle fed ones (Marinelli, Burke, & Dodd, 2001; and Rocha, Martinez & Jorge, 2000). There is always the tendency of air been taken in as neonate takes milk, therefore burping the neonate is very important. Burping gets the air out of the neonate's stomach. Most caregivers in this study did not burp the neonates during and after feeding. This could be associated with the general assumption that infants on breastfeeding do not require burping in many cultures. Comparison of cup feeding practice between the nurses and other care givers revealed that nurses had better practice though; there was a general poor practice by all care givers. There is a need to retrain nurses and educate mothers on the cup feeding.

Conclusion

The hospital used for this study is a baby friendly hospital and as a policy, cup feeding of neonates is the alternative feeding method. Although nurses had a better practice of cup feeding than other care givers, there was a general poor practice by all care givers. There is therefore a need to retrain nurses and educate mothers on cup feeding.

Relevance to Clinical Practice

Cup feeding is a method of feeding used by many neonatal and paediatric clinics/wards of developing nations. Failure to follow the guidelines would result in negative outcomes that may increase the morbidity and mortality rate. This study revealed that caregivers are deficient in the practice and there is a need for training and retraining.

Reference

- Abouelfetoh, A. M., Dowling, D.A., Dabash, S.A., Elguindy, S.R., & Seoud, I. A., (2008). Cup versus bottle feeding for hospitalized late preterm infants in Egypt: A quasi-experimental study. *International Breastfeeding Journal*, 3:27 (accessed 3rd July 2012)
- Al-Sahab, B., Feldman, M., Macpherson, A., Ohlsson, A., & Tamim, H., (2010). Which method of breastfeeding supplementation is best? The beliefs

- and practices of paediatricians and nurses. *Paed Child Health*, 15(7):428-431
- Collins CT, Makrides M, Gillis J, McPhee AJ. (2008). Avoidance of bottles during the establishment of breast feeds in preterm infants. Cochrane Database of Systematic Reviews, Issue 4. Art. No.: CD005252. DOI: 10.1002/14651858.CD005252.pub2.
- Crivaro, V., Di Popolo, A., Caprio, A., Lambiase, A., Di Resta, M., Borriello, T., Scarella, A., Triassi, M., & Zarrilli, R., (2009). Pseudomonas aeruginosa in a neonatal intensive care unit: molecular epidemiology and infection control measures. *BMC Infect Dis*, 9: 70-70.
- Flint A, New K, Davies MW. (2007). Cup feeding versus other forms of supplemental enteral feeding for newborn infants unable to fully breastfeed. *Cochrane Database of Systematic Reviews*, Issue 2. Art. No.: CD005092. DOI: 10.1002/14651858.CD005092.pub2.
- Flint, A., New, K., & Davies, M. W., (2009). Cup feeding versus other forms of supplemental enteral feeding for newborn infants unable to fully breastfeed (Review) *The Cochrane Library*, Issue 2 <http://www.thecochranelibrary.com>(accessed 7th July 2012)
- Howard CR, Howard FM, Lanphear B, Eberly S, deBlicke EA, Oakes D, Lawrence RA: (2003). Randomized clinical trial of pacifier use andbottle feeding or cup feeding and their effect on breastfeeding. *Pediatrics*, 111:511-518.
- Howard, C.R., Howard, F.M., Lanphear, B., Eberly S., deBlicke E. A., Oakes D., & Lawrence R. A., (2003). Randomized clinical trial of pacifier use andbottle feeding or cup feeding and their effect on breastfeeding. *Pediatrics*, 111:511-518.
- Kayode T Ijadunola1, Macellina Y Ijadunola, Olapeju A Esimai, & Titilayo C Abiona (2010). New paradigm old thinking: the case for emergency obstetric care in the prevention of maternal mortality in Nigeria. *BMC Women's Health*, 10:6 <http://www.biomedcentral.com/1472-6874/10/6>
- Kliethermes PA, Cross ML, Lanese MG, Johnson KM, Simon SD, (1999). Transitioning preterm infants with nasogastric tube supplementation:increased likelihood of breastfeeding. *J Obstet, Gynecol Neonatal Nur*, 28:264-273.
- Lam, B.C., Lee, J. & Lau, J. L., (2004). Hand hygiene practices in a neonatal intensive care unit: a multimodal intervention and impact on nosocomial infections. *Paed*, 114(5) e 565-71
- Lang, S., Lawrence, C. J., & Orme, R. L., (1994). Cup feeding: an alternative method of infant feeding. *Archives of Disease in Childhood*, 71: 365-9.
- Marinelli, K. A., Burke, G.S., & Dodd, V.L., (2001). A comparison of the safety of cupfeedings and bottlefeedings in premature infants whose mothers intend to breastfeed. *Journal of Perinatology*, 21:350-5.
- Moolenaar, R.L., Crutcher, J. M., San Joaquin, V. H., Sewell, L. V., Hutwagner, L. C., Carson, L. A., Robison, D. A., Smithee, L. M., & Jarvis W. R., (2000). A prolonged outbreak of Pseudomonas aeruginosa in a neonatal intensive care unit: did staff fingernails play a role in disease transmission? *Infect Control HospEpidemiol*, 21: 80-85.
- Neifert M, Lawrence RA, Seacat J., (1995). Nipple confusion: toward a formal definition. *J Pediatr*, 126(6):S125-S129.
- Oddy, W. H., (2002). The impact of breast milk on infant and child health. *Breastfeed Rev*, 10: 5-18.
- Pittet, D., Hugonnet, S., Harbarth, S., Mourouga, P., Sauvan, V., Touveneau, S., & Perneger, T. V., (2000). Effectiveness of a hospital wide program to improve compliance with hand hygiene. Infection Control Program. *Lancet*, 356(9248): 2196
- Righard L., (1998). Are breastfeeding problems related to incorrect breastfeeding technique and the use of pacifiers and bottles? *Birth*, 25:40-44.
- Rosenthal, V.D., Guzman, S., & Safdar, N., (2005) Reduction in nosocomial infection with improved hand hygiene in intensive care unit of a tertiary care hospital in Argentina. *Am J Infect Control*, 33(7): 392-7
- Samuel P., (1998). Cup feeding. How and When to use with term babies. *Practising Midwife*. 1:12:33-5.
- Schubiger G, Schwarz U, Tonz O., (1997). UNICEF/WHO Baby-Friendly Hospital Initiative: does the use of bottles and pacifiers in the neonatal nursery prevent successful breastfeeding? *Eur J Pediatr*, 156:874-877.
- UNICEF, (2012). The Baby Friendly Initiative. <http://www.unicef.org/programme/breastfeeding/baby.htm> (accessed 20th July 2012)
- World Health Organization. (1997). *Infant feeding in emergencies: A guide for mothers*. EU/ICP/LVNG 01 02 08. Copenhagen: WHO Regional Office for Europe, Nutrition Unit.