

## **Breastfeeding Practices and Maternal Weight Changes in the First Six Months after Delivery in Southwest Nigeria**

**Uwemedimbuk S. Ekanem\*<sup>1</sup>, Ayodeji A. Onayade<sup>2</sup>, Titilola C. Abiona<sup>2</sup> and Emem E. Bassey<sup>3</sup>**

<sup>1</sup>Department of Community Health, College of Health Sciences, University of Uyo, Uyo

<sup>2</sup>Department of Community Health, College of Health Sciences, Obafemi Awolowo University, Ile-Ife

<sup>3</sup>Department of Obstetrics and Gynecology, College of Health Sciences, University of Uyo, Uyo

\*E-mail: uwemedimbuk@yahoo.com

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### **ABSTRACT**

To assess breastfeeding practices and relate it to changes in the maternal weight in the first six months after delivery, 422 healthy breastfeeding women, who recently delivered single, term babies, vaginally, were recruited from November 2003 to January 2005; they were followed up monthly for six months. Their height and monthly weight including the monthly weight of the babies were measured.

Two hundred and ten of the mother-infant pairs were successfully followed up for six months. One hundred and three (49.05%) of them breastfed their infants exclusively on breast milk for six months. Although these mothers were generally heavier compared to those who commenced complementary feeding before four months and those who commenced complementary feeding between four and six months (mean (SD) 62.16(11.60) kg, 57.67(9.48) kg, 60.52(9.80) kg), they also lost more weight during the period (mean (SD) -1.45 (3.07) kg, - 0.42 (3.72) kg, 0.48 (3.29kg) respectively). It was concluded that mothers who breastfed their babies exclusively on breast milk for six months, lost more weight when compared to those who commenced complementary feeding before six months. However, this effect was only seen in the short term.

**Keywords:** Breastfeeding, complementary feeding, infant, maternal weight changes, six months after delivery

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### **INTRODUCTION**

The health of mothers and their under-five children is intimately related. This relationship is more critical during pregnancy and in the first few months of life when the baby is totally dependent on the mother for care, nutritional and other needs. Despite all efforts, infant and maternal mortality indices in most developing countries of the world, especially in sub Saharan Africa, remain very poor. The 2008 Nigerian Demographic and Health Survey reported an Infant Mortality Rate (IMR) of 75 per 1, 000 live births and Maternal Mortality Ratio (MMR) of 800 per 100,000 live births have been reported by the United Children's Fund (UNICEF) [16, 22]. The main health problems of women and children in most developing countries including Nigeria, rotate round the axis of malnutrition, infection and unplanned fertility [24]. Child and maternal under-weight is a leading contributor to the burden of disease borne by women and children globally; and it has been estimated to account for 138 million Disability-Adjusted-Life-Years (DALYS) [11]. Interestingly, breastfeeding affects the core triad of maternal and child health problems, that is, nutrition, infection and fertility. The benefits of human breast milk and the advantages of breastfeeding, particularly exclusive breastfeeding in the first six months of life have been widely researched and well documented [2, 12, 13, 18, 23]. The public health implications of shortened or total absence of breastfeeding are enormous, affecting every segment of the society.[14] Maternal weight gain is usually cited as a barrier to prolonged or exclusive breastfeeding, there are conflicting views on maternal weight changes during breastfeeding [3, 5-7, 19, 21]. While some researchers noticed minimal weight loss, others observed very high figures [4,8]. In Nigeria, a prospective study of 264 mothers-infant pairs concluded that exclusive breastfeeding supported adequate infant growth in the first six months of life for normal birth weight infants and that the growth curves of these infants were above the 50<sup>th</sup> percentile curve on the WHO and NCHS reference [1]. However this study neither provided information on the weights of the mothers, nor evaluated the maternal weight changes during the period of exclusive breastfeeding. Therefore, the objective of this study was to determine the breast feeding practices in a rural Nigerian population and describe weight changes in breastfeeding mothers in the first six months after delivery.

### **MATERIALS AND METHODS**

This longitudinal study carried out between November 2003 and January 2005, recruited mothers within the first two weeks of delivery, from two (out of six) randomly selected primary health facilities-Urban Comprehensive Health Center (UHC), an arm of the Obafemi Awolowo University Teaching Hospitals Complex, and Ife Central

Primary Health Center (ICPHC). Eligible mothers were those whose babies weighed 2.5kg or more at time of recruitment, who consented to participate in the study. Mothers who had multiple births, premature neonates, neonates with medical conditions that warrant hospital admission and those who had congenital anomalies which interfered with suckling were excluded from the study. Similarly, mothers who had operative deliveries, those with severe medical conditions or conditions that warrant long hospital admission or daily medications post delivery, and those who could not breastfeed or did not intend to breastfeed were excluded from the study. Sample size was calculated using the prevalence of exclusive breastfeeding in the study location. Abiona *et al* reported an exclusive breastfeeding rate of 76.5% [1].

Table-1: Socio-demographic characteristics of recruited mothers who were successfully followed up for six months

Characteristic	Frequency (n=210)	Per (%)
Age in years		
< 20	5	2.4
20-29	128	61.0
30-39	72	34.3
40 and above	5	2.4
Marital status		
Married (lives with spouse)	200	95.2
Married (not living with spouse)	10	4.8
Level of education		
No formal education	3	1.4
Primary Education	27	12.9
Secondary Education	129	61.4
Post Secondary Education	51	24.3
Occupation		
Self employed	150	71.4
Unemployed	31	14.8
Formally employed in the Public/Private Sector	29	13.8

Table 2: : Breastfeeding practice of successfully followed up mothers for six months after delivery.

Duration after delivery (months)	No.	EBF (%)	Not EBF (%)
Recruitment	422	388 (91.9)	34 (8.1)
1	260	250 (96.2)	10 (3.8)
2	250	237 (94.8)	13 (5.2)
3	237	217 (91.6)	20 (8.4)
4	216	170 (78.7)	46 (21.3)
5	213	156 (73.2)	57 (26.8)
6	210 <sup>a</sup>	103 (49.0)	100(47.6)

<sup>a</sup> Seven of these mothers had given their infants other drinks at the time of recruitment, but discontinued thereafter following counselling on exclusive breastfeeding. They were excluded from further analysis.

Using Epi Info version 6, to calculate sample size for descriptive study by random sampling, and assuming a worst acceptable result of 71.5% (i.e.5% error margin), at 90% confidence level, a sample size of 195 was obtained. However to make up for attrition, using a loss to follow up rate of 33% as reported by Abiona *et al*, a total sample size of 260 was calculated. Eligible mother–infant pairs were recruited serially from the daily immunization clinics of UCHC and ICPHC. Each pair was followed up monthly, until the babies were six months old. Data collection at recruitment and follow-up was done by the lead researcher and two trained assistants (Community Health Officers), one each, from the two health facilities. Information at recruitment was collected using a structured questionnaire, that sought information on the bio- data of the respondents as well as their knowledge and practice about

breastfeeding including the index infant’s feeding history. In addition, weight and height of mothers, weight of the index infant and illness reports were also recorded. Weighing was done using a digital Seca Solar Scale, UNICEF electronic scale 890, manufactured for UNICEF in Australia. The scale was standardized once a week using a metal bar of known weight. The babies were weighed nude, while the mothers were weighed with as minimal clothing as possible, without shoes, headgears and extra wrappers/clothing. Maternal height was measured at recruitment, using a stadiometer; made in England by Weylux, model 424. Weight was recorded in Kilogrammes (Kg) and height in meters. A form was created to collect follow-up data. The form had sections on infant and mother’s monthly record of weights and infant’s feeding history and illness episodes. Ethical clearance for the study was obtained from the ethical committee of Obafemi Awolowo University Teaching Hospitals Complex. Prior to data collection, the purposes and requirements of the study were explained in detail to eligible participants and any questions they raised were answered. Subsequently, verbal informed consent was obtained from mothers who agreed to participate. Data entry, cleaning and analysis was done using the Statistical Programme for the Social Sciences (SPSS) and the Computer Programme Epidemiological Analysis (CPEA) software. Mother-infant pairs were divided into three groups for data analysis - those who breastfed exclusively till six months, those who commenced complementary feeding between four months and less than six months and those who commenced complementary feeding before four months. Monthly mean weights of the mothers including the differences in their mean weight changes at three months, four to less than six months and at six months were compared using analysis of variance. For all tests, a p-value of 5% or less was accepted as statistically significant.

Table-3: Monthly mean weights (Kg) of mothers in the first six months after delivery according to breastfeeding practices

Age (months)	Breastfeeding category			P- value		
	1(sd) <sup>a</sup> n=46	2 (sd) <sup>b</sup> n=54	3 (sd) <sup>c</sup> n=103	1 vs. 2	2 vs.3	1 vs.3
Recruitment	58.09(9.15)	61.01(9.61)	63.62(11.12)	>0.05	>0.05	<0.05
1	57.50(9.11)	59.82(9.50)	62.99(11.12)	>0.05	>0.05	<0.05
2	57.63(9.07)	59.92(9.40)	62.84(11.39)	>0.05	>0.05	<0.05
3	57.68(9.20)	60.51(9.49)	62.80(11.63)	>0.05	>0.05	<0.05
4	57.79(9.48)	60.51(9.70)	62.50(11.57)	>0.05	>0.05	<0.05
5	57.67(9.37)	60.57(9.84)	62.28(11.64)	>0.05	>0.05	<0.05
6	57.67(9.48)	60.52(9.80)	62.16(11.60)	>0.05	>0.05	<0.05

<sup>a</sup> -mothers who gave their infants complementary feeds before the age of four months.

<sup>b</sup> -mother who gave their infants complementary feeds from four months.

<sup>c</sup> - mothers who exclusively breastfed their infants for six months

sd - standard deviation

Table-4: Mean weight changes of mothers by their breastfeeding categories.

Post-delivery duration (months)	c		b		a	
	Mean difference (SD)	Remarks on p	Mean difference (SD)	Remarks on p	Mean difference (SD)	Remarks on p
0 -3	-0.82 (2.68)	<0.05	-0.50 (2.16)	>0.05	-0.41 (3.09)	>0.05
4 - <6	-0.33 (1.12)	<0.05	0.02 (1.27)	>0.05	-0.12 (1.55)	>0.05
0 – 6	-1.45 (3.07)	<0.05	-0.48 (3.29)	>0.05	-0.42 (3.72)	>0.05

a - Mothers who gave their babies complementary feeds before the age of four months.

b - Mothers who gave their babies complementary feeds from four months of age.

c - Mothers who exclusively breastfed their babies for six months.

## RESULTS AND DISCUSSIONS

Four hundred and twenty-two mother-infant pairs were recruited into the study but only 210 (49.8%) were followed up to six months of age. Of these 103 (49.05%) breastfed exclusively for up to six months of age, while 100 (47.62%) gave complementary feeds before the age of six months, and 7 (0.03%) of the mothers only gave fluids before recruitment, they stopped and fed their babies with breast milk only till six months, however these were excluded from analysis. Table-1 shows the sociodemographic characteristics of all the mothers. Two hundred and

sixty-two (62.1 %), were aged 20-29 years, majority 393 (93.1%) were married and lived with their spouses, 268 (63.5%) had secondary education. Most of the mothers were self-employed (74.0%) and about a third of the mothers (36.7%) had only one child, the index child.

The breastfeeding practices of the mothers who were successfully followed up for six months after delivery showed that the percentage of mothers that exclusively breastfed decreased progressively with each month of life from 91.9% at recruitment to 49.05% at six months. Conversely, the percentage of mothers who gave their infants other foods/drinks increased monthly from 3.8% in the first month to 47.62% at six months (Table-2). Compared to 76.5% obtained by Abiona *et al* and 61% by Ojofeitimi *et al* in the same locality few years prior to the time of this study, the prevalence of exclusive breastfeeding till six months is obviously reducing in the study locality [1,17]. Some reasons for this include erosion of the gains of the Baby Friendly Initiative following less intense promotion of exclusive breastfeeding in health facilities and communities. In addition, other previously established reasons including early return to work for women in formal employment, the cultural belief that children need to drink water and the lack of confidence in the adequacy of breast milk to supply all the nutrients that a child needs in the first six months of life perhaps also contributed to the reduction. Other studies have reported other reasons for the declining EBF rates to include insufficient breast milk or babies not gaining weight adequately on breast milk alone. Dewey reported these last two as some of the factors that are responsible for suboptimal infant breastfeeding behaviour [9]. In India Sachdev *et al* reported that a significant proportion of health workers believed that water supplementation to babies was needful in hot weather [20].

A comparison of the mean weights of the mothers that were successfully followed up according to their breastfeeding categories showed that the mothers who exclusively breastfed their infants for six months started off with significantly higher weights and remained consistently heavier than those who introduced complementary feeds before the age of four months. However, their weights were comparable to those who introduced complementary feeds after four months (Table-3). The weight changes of the mothers over the first six months postpartum, with respect to their breastfeeding categories shows that the mothers who breastfed exclusively for six months had the highest weight loss (1.45kg) and more than half of this was lost in the first three months after delivery. The mean difference was significant. Mothers, who commenced complementary feeding before four months, lost the least weight (0.42kg), among the three groups. This was however not statistically significant (Table 4). This supports the observations made in previous studies, which reported that women who breastfed experienced a gradual weight loss in the first six months after delivery [8,15]. Though some authors have argued that all women lose weight after delivery whether breastfeeding or not, this study shows that women who exclusively breastfed lost more weight. However, while Brewer *et al* reported a higher mean weight loss of 1.38kg/month, an average weight loss of 0.23kg/month was observed in this study. When compared with the figures reported by Dewey *et al* ( $0.7 \pm 1.5$ kg), the  $1.45 \pm 3.07$ kg loss observed in this study doubles the Dewey's figure, in the EBF for six months group, but Dewey's study group were strictly primiparous, low-income women [8,4].

The fact that the women who exclusively breastfed their infants for six months had higher weight loss perhaps reflects the extra demands of breastfeeding exclusively for 6 months. Contrary to the observation by Brewer *et al* and Dewey *et al* who noted that weight loss after delivery was significantly greater in breastfeeding women from three to six months, the women in this study lost more weight in the first three months after delivery. This observation could not be explained [4,10].

The observation that mothers who exclusively breastfed their infants for six months, were generally heavier than those who commenced complementary feeding before the age of six months could not be explained. It is not certain if and to what extent the mothers' self-perception of "thinness" affected their timing of introduction of complementary feeding. Perhaps mothers who perceived themselves to be "thin" might have introduced complementary feeding early because of cosmetic reasons or probably due to fear of the demands of breastfeeding exclusively on their own health or their ability to sustain their infants on breast milk alone for the first 6 months of life.

## CONCLUSION

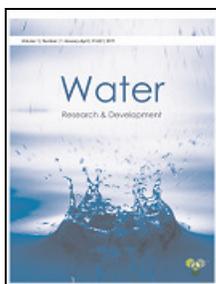
Mothers who practiced exclusive breastfeeding for six months, lost more weight compared to those who commenced complementary feeding before six months. This is another potential benefit of exclusive breastfeeding to the mother, which could be used in public health education campaigns to promote exclusive breastfeeding. On the other hand, it may be worthwhile to investigate the effect of such weight loss on mothers who have borderline malnutrition.

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