

## Breastfeeding Practices and Infant Development during the First Six Months of Life, New Cairo City

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### Abstract

**Background:** Breastfeeding is the optimal way of providing ideal food for the healthy growth of infants. However, successful breastfeeding initiation and continuation required a technique that is effective and comfortable for both mother and infant. Scarcely researches were conducted to describe this technique with no consensus or sufficient evidence regarding the recommended positions, baby holding, and latching-on.

**Objective:** This study was aiming to describe breastfeeding technique, its contributing factors, and its effect on infants' development during the first six months of life.

**Methodology:** One hundred twenty three nursing mothers were selected out of those coming for immunization or for follow up in the well-baby clinic of a primary healthcare unit in "Etagamoh Al-Awal", New Cairo. Women were interviewed to inquire about the preferred breastfeeding positions, baby holding and latching techniques with the use of show cards to help understanding. Mothers were observed as being nursing their babies in a private room to evaluate their techniques using an observation checklist. The technique was considered correct if the checklist score was five or more out of seven points. Infants' development was evaluated according to the WHO growth reference standards of weight and length.

**Results:** The frequently used position was sitting (56.9%, 70/123) followed by side lying (22.8%, 28/123). The least were laid-back (11.4%, 14/123) and cross-legged sitting (8.9%, 11/123). The most frequently used holding method was cradle (27.6%, 34/123) and cross-cradle (20.3%, 25/123). Football holding method was the least to be used (8.1%, 10/123). The commonest latching-on technique was the baby-led one (45.5%, 56/123). On observing mothers during nursing, correct technique was observed among 84.6% (104/123). Mothers were significantly practicing the correct technique with babies of the second birth-order or later more than with the first baby (95.1% versus 63.4,  $p$  value < 0.001, OR: 11.25, 95% CI: 3.14 – 49.59). Mothers practicing correct technique was significantly more among normal weight than among underweight infants (91.5% versus 41.2%,  $p$  value < 0.001, OR: 15.49, 95% CI: 4.03 – 59.2). The same apply with infants of

normal weight for length compared to wasted infants (95.2% versus 26.3% respectively, p value <0.001, OR: 55.44, 95% CI: 12.1 – 271.19). Breastfeeding advice through a health care provider was limited (24.4%, 30/123).

**Conclusion:** Correct technique of breastfeeding was performed among 84.6% and was strongly associated with infant development. The commonest position is sitting with cradle holding and baby-led latching-on technique. Educational and training breastfeeding program is required for enhancing adoption of the proper technique to ensure successful initiation and continuation of breastfeeding.

**Key words:** Breastfeeding technique – Infants below six months – Infant development

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## Introduction

Breastfeeding is the ideal way of infant feeding for the healthy growth and development.<sup>1</sup> It is an important public health strategy for improving infant and child health, and for reduction of health care costs. Breastfeeding is associated with reduced risk of illness for both infants and mothers.<sup>2</sup>

The mother's technique during feeding her baby is of crucial importance for successful initiation and continuation of breastfeeding and, in turn, the infant development. This technique includes correct baby and mother positioning, and the technique of latching on. They lead to proper baby attachment, suckling, prevent nipple soreness and allow the baby to obtain enough milk.<sup>3</sup>

Inadequate prenatal education in correct breastfeeding technique was associated with higher rates of preventable hospital admission in newborns.<sup>4</sup>

The consensus opinion of experts in the WHO and UNICEF recommend exclusive breast feeding for the first six months of life and starting of appropriate complementary feeding from six month with continuation of breastfeeding until two years or beyond.<sup>5</sup> The rate of exclusive breastfeeding is disappointingly low both in Egypt and worldwide. In Egypt, it was reported to be 40% among infants of less than six months of age.<sup>6</sup> Worldwide, the rate of exclusive breastfeeding is also far beyond the recommendation.<sup>7</sup> Although some previous studies tried to fine out the different factors that may lead to this low

prevalence in Egypt,<sup>8</sup> none of them described the mothers' technique as being breastfed their babies especially regarding positioning, holding, and latching-on technique. Much of the information available on the techniques that is regarded as "recommended" was anecdotal; only derived from mothers' personal experiences or reported as expert opinion unreferenced. There is no consensus opinion regarding the "best" breastfeeding position or holding technique with diverse recommendations in this respect.<sup>9</sup>

## Aim of the Work

To describe breastfeeding technique, its contributing factors, and its effect on infants' development during the first six months of life among mothers attending a primary health care center in New Cairo city.

## Methodology

### Study design and sample

A cross-sectional study was carried out on women whose infants were six months or less, and coming for immunization or for follow up in the well-baby clinic in a primary healthcare unit in "Etagamoh Al-Awal", New Cairo. The estimated average daily number of those women was around 20. Mothers who breastfed their infants either exclusive or non-exclusive and agreed to participate in the study were included. A total of 123 women were selected out of 356 women who were interviewed on a biweekly basis, within a 14 months period from the beginning of December 2012 to the end of January

2014. Women were interviewed to enquire about their preferred breastfeeding technique and observed as being nursing their infants in a private room. Breastfeeding technique was evaluated according to the WHO observational checklist.<sup>10</sup> Infant's weight was measured, undressed with a clean disposable diaper, using Seca infant scale and recorded to the nearest 0.1 kg. The recumbent infant length was measurement to the nearest 0.1 cm, using plastic length boards

### Study tools

**I - Observation checklist:** included the following items:

1 - General

*Mother:* looks healthy, relaxed and comfortable, mother-baby eye contact (bonding).

*Baby:* looks healthy, calm and relaxed, reaches or roots for breast.

2 – Breasts: look healthy, no pain or discomfort, well supported with fingers.

3 - Correct Baby's Position: head and body in line, held close to mother's body, whole body supported, approaches breast; nose to nipple.

4 - Correct Baby's Attachment: more areola seen above upper lip, mouth open wide, lower lip turned outwards, chin touches breast.

5 – Suckling: slow, deep sucks with pauses, cheeks round when suckling.

6 - End of feeding: baby releases breast when finished

Each observed item was given a point and each woman was given a score out of a total 7 points.

**II – An interview questionnaire:** including demographic data, the receipt of any advice or training on breastfeeding and its source, time of breastfeeding initiation, and whether or not supplementary feeding was introduced. The usual utilized breastfeeding position, baby holding, and latching technique, and the use of feet or arm supports for ergonomic posture were inquired about. The questionnaire was used for data collection after being field tested, for the appropriateness and comprehension of its questions, on a sample of 20 women selected from the same study healthcare unit and the necessary rephrasing was performed.

**III – Show cards:** To help mothers respond correctly, show cards containing pictures of the various recommended positions and the holding techniques were used.

**IV – WHO Growth standards:** Infants' anthropometric Z-scores were calculated using the World Health Organization (WHO) growth standard.<sup>11</sup>

### Definition of variables:

1 - Woman was considered practicing a correct breastfeeding technique if her observation score was  $\geq 5$  points.

Mothers who were observed to nurse her baby incorrectly were advised accordingly.

2 - Under weight was considered when weight for age z-score (WAZ)  $< -2$  SD, and overweight when (WAZ)  $> +2$  SD

3 - Stunting was considered when the length for age z-score (LAZ)  $< -2$  SD

4 - Wasting was considered when the weight for length z-score (WLZ) < -2 SD

### Data Management and Analysis:

The collected data were coded and revised for completeness and precision. Data entry, management, and analysis were performed using Statistical Package for Social Science (SPSS) version 17.<sup>12</sup> Both descriptive and analytical statistics were performed. Mean, standard deviation (SD), minimum, and maximum, for numerical data, and percentage for categorical data were calculated. Chi-Square test was calculated to test for differences between proportions.  $P \leq 0.05$  was considered significant

### Ethical consideration

Approval for study conduct was obtained from the Ethical Committee at the Faculty of Medicine Ain Shams University. Verbal consent was taken from participants after explaining the purpose of the study and ensuring confidentiality of information.

### Results

A total of 123 mother-infant pairs, with the infants in the first 6 months of life, were selected. The mean age of mothers was  $27.0 \pm 4.0$  years. More than a third of them (37.4%) was university graduates, 22.0% were working for cash and about a third (35.8%) having a family income less than 1000 Egyptian Pounds. About half of infants (45.5%) were at 4 – 6 months of age, 36.6%

were females, and 33.3% was the first in his/her family (table 1).

Breastfeeding advices were given through a health care provider among 24.4% of mothers, and through a relative or a friend among 57.7%. None of the participants had received any training on how to nurse their infants. About two thirds of mothers (68.3%) began breastfeeding within the first two hours of delivery and the majority (96.7%) were performing “on demand” pattern. Frequency of feeding of less than recommended was mentioned by 24.4% of mothers.

According to the observation checklist, incorrect breastfeeding technique was observed among 19 (15.4%) mothers with the scoring points of 1 or 2. No observed graduation of the scoring points. Supplementary feeding was introduced by 47 (38.2%) mothers and the most frequently mentioned causes were “perceived little milk” (40.4%) or “perceived small weight for age infants” (38.3%). The proportion of exclusive breastfeeding was 61.8%, being highest at the age of two months or less (75.0%), decreasing to 64.1% between two to four months, and to 53.6% between four to six months (table 2).

The percentages of under-weight, and wasting were 13.8% (17/123), and 15.4% (19/123) respectively. No stunting cases were observed (table 3).

Table (4) shows that the most preferred nursing position was the sitting either on a chair or on bed, (mentioned by 70 (56.9%) woman). Side lying

comes after, which was mentioned by 28 (22.8%) as the preferred position. The least preferred positions were the laid-back, 14 (11.4%), and the cross-legged sitting; 11 (8.9%). The preferred baby holding methods in order of frequency were cradle, 34 (27.6%), cross-cradle 25 (20.3%), laid-back 14 (11.4%), vertical baby 12 (9.8%), football hold 10 (8.1%). The latching-on was baby-led among about half of participants 56 (45.5%) and mother-led among 19 (15.4%) which predominantly performed in the first days of life. The use of both arm support and foot support on sitting was common 96 (78.1%). The majority of women, 104 (84.6%), were practicing one of the recommended techniques. Those who practiced non-recommended technique were those with checklist score less than 5 points (incorrect technique).

In table (5), analysis of factors that might correlate with the breastfeeding technique revealed that mothers were significantly practicing the correct techniques with babies of the second birth-order or later more than with the first baby (95.1% versus 63.4,  $p$  value < 0.001, OR: 11.25, 95% CI: 3.14 – 49.59). Percentage of mothers practicing the correct technique was significantly more among normal weight infants than among underweight infants (91.5% versus 41.2%,  $p$  value < 0.001, OR: 15.49, 95% CI: 4.03 – 59.2). The same apply with infant of normal weight for length compared to wasted infants, among which the percentage of mothers practicing the correct techniques were 95.2% versus 26.3% respectively,  $p$

value <0.001, OR: 55.44, 95% CI: 12.1 – 271.19.

## Discussion

The objective of this study was to assess the techniques of breastfeeding and its impact on the growth of infants. Much of the information available on the techniques that is regarded as “recommended” was anecdotal; only derived from mothers’ personal experiences or reported as expert opinion unreferenced. Scientific research studies that dealing with the detailed description of preferred techniques was scarce. There is no consensus opinion regarding the “best” breastfeeding position or holding technique, however, some studies mentioned some techniques and positions that could stimulate breastfeeding with minimal fatigue.<sup>13–16</sup>

In this study, mothers were considered practicing a recommended technique if she mentioned any one of them based on the show cards. More than a half of mothers (56.9%, 70/123) mentioned to take the sitting position during baby nursing as it was mentioned to be convenient for both mother and baby. It is the most commonly utilized traditional position.<sup>17,18</sup> The upright sitting posture was sometimes insisted to be utilized due to etiquette, as leaning back may be associated with unkempt appearance.<sup>17</sup> Sitting position allows breasts to ‘point downwards and outwards’ for better attachment of baby to the breast.<sup>19</sup> However, this position has the potential for muscular fatigue, and it is the most difficult for baby to maintain.<sup>20</sup> Sitting position that is away from the

standard recommendation for the workplace will be inappropriate for breastfeeding. Inappropriate prolonged positions, especially with unsupported back as in case of breastfeeding, could lead to overstress of the trunk muscles with pain and discomfort and may end in mechanical deformation of normal soft tissues.<sup>21</sup>

Side-lying was the second utilized position (22.8%, 28/123) by mothers. This position is usually advisable after caesarean section.<sup>17</sup> Although this position was considered by many mothers to be comfortable and relaxing for both her and her child, it may pose some difficulty on baby latching on the breast.<sup>19, 22</sup> In addition, fear of the risk of smothering and suffocation of baby when sleepy especially in case of obese mothers with large breasts, as well as the erroneous believe of ear infection from breast milk dripping may be the cause of infrequent use of this position.

Laid-back position was utilized by only 11.4% (14/123) of mothers although it is the biological nurturing and relaxing position. It is very useful, not only with newborn but also later as the baby getting older and especially useful for nursing more than one baby.<sup>9</sup> However, the upright sitting posture was sometimes insisted to be utilized due to etiquette, as leaning back may be associated with unkempt appearance.<sup>17</sup>

The most commonly used holding technique was cradled; practiced by 27.6% (34/123) of our participants. This finding is confirming with some reported unreferenced expert opinion and mother

experiences mentioning it as the traditionally used holding technique. However, this position is challenging for new mothers, as it is difficult to control head with keeping him/her close to breast.<sup>9</sup> Came next, is the cross-cradle technique which was regarded as the best especially with newborn small babies because it allows for good control of baby's head and body on the contralateral arm while mother giving the breast to baby. However, it needs good support under the holding arm.<sup>9</sup> The least mentioned holding methods were vertical position (9.8%, 12/123) and football holding (8.1%, 10/123). Football holding is an under arm position with the head and shoulders supported by mother's hand on the same side of feeding breast and the rest of the body extended backwards. It is suitable after delivery by caesarian section.<sup>9</sup> It is worth mentioning that the utilized techniques were dynamic; mothers may change the technique or utilize more than one technique, but the results herein were depending on the usual most frequent technique that the mother used.

Baby-led latching on technique was the most frequently performed method among participant mothers (45.5%, 56/123). This method of bringing the baby to the breast and not the breast to the baby entails adjustment of the proper positioning of mother and her baby in a comfortable way. This method was reported to be important for preventing nipple soreness and for increasing the ability for baby to obtain milk from breast.<sup>3</sup> Poor latch on technique was associated with discontinuation of breastfeeding.<sup>23</sup>

The use of ergonomic support of feet, arm, or both was common (7.3%, 14.6%, and 53.7% respectively). This technique can help minimizing the associated fatigue and musculoskeletal disorders that may results from poor un-ergonomic positions.

On observing mothers as being nursing their infants revealed that 19 (15.4%) performed incorrect positioning and attachment with associated pain and discomfort during nursing. Their score points were either one or two. No graduation of the distribution of mothers' scoring; it was either low (one or two) or high (five or more). The absence of the intermediate category may indicate that some of the assessment items are related to each other that we can called them "the success-related items". These items were mainly the baby's positioning and attachment; as mothers who performed correct positioning also performed correct attachment.

Correct breastfeeding technique was significantly associated with infant order. The probability of the second or later infants to be correctly nursed was 11 times as that among the first infant (OR: 11.25, 95% CI: 3.14 – 49.59). This finding suggested the notion of gained experiences that mothers obtained with their later infants. However, receiving breastfeeding advices through a health care provider was not significantly associated with the correct technique. This finding may be due to that breastfeeding technique needs a sort of training and demonstration, which was not the case, as none of the participants

had received training on how to nurse their infants. The inadequate parental breastfeeding education was associated with hospital re-admission for feeding problems, a condition that is easily preventable.<sup>4</sup>

Infant development was strongly associated with practicing a correct breastfeeding technique. Normal infant weight for age and weight for length were 15 and 55 times more common with correct breastfeeding technique respectively (Weight-for-age OR: 15.4, 95% CI: 4.03 – 59.2. Weight-for-length OR: 55.4, 95% CI: 12.1 – 271.2). This finding signifies that correct technique is the starting point that results in successful breastfeeding practice with its impact on the development of infants.

## Conclusion

Most of mothers practiced a correct breastfeeding technique. The frequently used position was sitting followed by side lying. The most frequently used holding method was cradle and cross-cradle, and baby-led latching on was the commonest latching technique. Correct technique had a strong impact on infant development. Breastfeeding advice through a health care provider was very limited. Breastfeeding training program with demonstration is required for enhancing adoption of the proper technique to ensure successful continuation of breastfeeding.

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Table (1) Demographic Characteristics of Participants

Characteristics	No = 123 (%)
<b>Infant's age</b>	
≤ 2 months	28 (22.8)
2 to 4 months	39 (31.7)
> 4 to 6 months	56 (45.5)
<b>Infant's sex: - Female</b>	45 (36.6)
<b>Infant's order: - First</b>	41 (33.3)
<b>Mother's Age</b>	
Mean ± SD = 27.0 ± 4.0	Median (IQ) = 26 (24-30)
< The median	51 (41.5)
≥ The Median	72 (58.5)
<b>Mother's education</b>	
Higher levels	46 (37.4)
Secondary level	30 (24.4)
Basic level or less	47 (38.2)
<b>Mother's job</b>	
Working for cash	27 (22.0)
House wife	96 (78.0)
<b>Family income &lt; 1000 LE</b>	44 (35.8)

Table (2) Breastfeeding Characteristics

Characteristics	No = 123 (%)
<b>BF source of information</b>	
From relatives or friends	71 (57.7)
Through the media	22 (17.9)
Through a health care provider	30 (24.4)
<b>Initiation of BF</b>	
Within 1 hours	30 (24.4)
Within 1 day	84 (68.3)
After the first day	9 (7.3)
<b>On demand feeding</b>	119 (96.7)
<b>Observed BF Score Points: <sup>a</sup></b>	
1 or 2	19 (15.4)
5 or more	104 (84.6)
<b>Observed BF Technique:</b>	
Incorrect <sup>b</sup>	19 (15.4)
Correct	104 (84.6)
<b>Supplementary feeding: Introduced</b>	47 (38.2)
<b>Exclusive BF:</b>	76 (61.8)
≤ 2 months (n = 28)	21 (75.0)
2 to 4 months (n = 39)	25 (64.1)
> 4 to 6 months (n = 56)	30 (53.6)

Correct frequency: 8 to 12 times/day.

<sup>a</sup> No mothers in the score category of 3 or 4 points

<sup>b</sup> Correct technique was considered if the total score of the observational checklist was ≥ 5 points

Table (3) Infant Development Indicators

Indicators <sup>a</sup>	No = 123 (%)	
Under weight	17 (13.8)	
Wasting	19 (15.4)	
Indicators z-score	Mean (±SD)	Min.- Max.
Weight	-0.33 ± 1.11	-2.9 – 2.0
Length	0.20 ± 0.81	-2.0 – 2.0
Weight for length	-0.56 ± 1.3	-3.2 – 2.0

<sup>a</sup> Normality is considered if z-score ≤ 2 SD and ≥ -2 SD

No cases of stunting was found

**Table (4) Breastfeeding Positions, Holding and Latching-on Techniques**

	N (%)
<b>Position of Mothers</b>	
Sitting on a chair or bed	<b>70 (56.9)</b>
Side lying	<b>28 (22.8)</b>
Laid-back	14 (11.4)
Cross-legged sitting	11 (8.9)
<b>Preferred Baby Holding Method</b>	
Cross-cradle	<b>25 (20.3)</b>
Cradle	<b>34 (27.6)</b>
Laid-back	14 (11.4)
Vertical baby	12 (9.8)
Football hold	10 (8.1)
Side lying	28 (22.8)
<b>Latching-on Technique</b>	
Baby-led	<b>56 (45.5)</b>
Mother-led	19 (15.4)
Both	30 (24.4)
Could not specify	18 (14.6)
<b>Ergonomic Posture</b>	
Use of foot rest on sitting	9 (7.3)
Use of arm support	18 (14.6)
Both	<b>66 (53.7)</b>
Nothing used	30 (24.4)

**Table (5): Correlates of Breastfeeding Technique**

	Correct N = 104 (%)	Incorrect N = 19 (%)	X <sup>2</sup>	P value	OR (95% CI)
<b>Infant's order</b>					
Second or later (n = 82)	78 (95.1)	4 (4.9)	21.04	<b>0.000</b>	<b>11.25 (3.14-49.59)</b>
First (n = 41)	26 (63.4)	15 (36.6)			
<b>Mother's education <sup>a</sup></b>					
Higher levels (n = 46)	40 (87.0)	6 (13.0)	1.89	0.389	0.98 (0.24 - 3.99)
Secondary level (n = 30).	23 (76.7)	7 (23.3)			0.48 (0.12 – 1.91)
Basic level or less (n = 47)	41 (87.2)	6 (12.8)			
<b>Mother's job</b>					
Working for cash (n = 27)	23 (85.2)	4 (14.8)	0.01	0.918	1.06 (0.30 – 4.83)
House wife (n = 96)	81 (84.4)	15 (15.6)			
<b>Source of BF advices</b>					
Health care provider (n = 30)	24 (80.0)	6 (20.0)	0.63	0.427	0.65 (0.20 – 2.33)
Other (n = 93)	80 (86.0)	13 (14.0)			
<b>Infants' WAZ <sup>a</sup></b>					
Normal (106)	97 (91.5)	9 (8.5)	<b>28.4</b>	<b>0.000</b>	<b>15.4 (4.03 – 59.2)</b>
Under-weight (n = 17)	7 (41.2)	10 (58.8)			
<b>Infants' WLZ <sup>a</sup></b>					
Normal (104)	99 (95.2)	5 (4.8)	<b>58.35</b>	<b>0.000</b>	<b>55.44 (12.1 – 271.2)</b>
Wasted (n = 19)	5 (26.3)	14 (73.7)			

<sup>a</sup>Exact significance was calculated

OR (95% CI): Odds Ratio and 95% Confidence Interval

WAZ: Weight for age z-score

WLZ: Weight for length z-score

Normality was considered if z-score  $\leq 2$  SD and  $\geq -2$  SD