

The Psychological Benefits of Continued Breastfeeding into The Second Year for Mother and Child

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ABSTRACT

The relationship between maternal psychological status, continued breastfeeding and child development and emotional status is the focus of this study. The study examined 120 mother-infant pairs (18-24 months post delivery): 60 who had continued to breastfeed into the second year and 60 who had discontinued breastfeeding over the first year post delivery. The anxiety and depression scores were measured for mothers, while development and behavior patterns were assessed for their children. The study revealed that anxiety scores were significantly higher among mothers who discontinued to breast feed over the first year post delivery. While depression scores were higher among mothers who continued breastfeeding into the second year. The developmental and behavior patterns of the children who were still breastfeeding into the second year of life were superior to those who had discontinued breastfeeding during the first year. High maternal anxiety and depression scores were associated with poor developmental and behavior outcome of their children. However high maternal depression scores among the breast fed infant had insignificant effects on their neurological and emotional development It is concluded that continued breastfeeding has psychological benefits for both mothers and their infants and can be protective for infants whose mothers suffer from depression. Mothers should be encouraged to continue to breast feed into the second year in order to assure optimal psychological development of their infants and to safeguard their own mental health status. Periodic counseling of breastfeeding mothers to support them, detect and decrease the ill-effects of their psychological status on their breastfeeding status and breastfed infants is highly recommended in order to support continued breastfeeding into the second year of life. (Int. J. Ch. Neuropsychiatry, 2005, 2(2): 143-153)

INTRODUCTION

The effect of breastfeeding on the superior cognitive and emotional development of the child and later Intelligent Quotient (IQ) has been documented by several studies. Breast fed infants versus artificially fed have been shown to have higher IQs and more advanced social and cognitive development relative to their hereditary makeup, the social, nutritional and environmental background^{1,2,3}. The benefits of breastfeeding to the nursing mother in the first few months after delivery have also been shown, attributed to mother infant bonding⁴. Early mother-infant bonding induces a series of changes in the brain cells with the release of chemical

neurotransmitters triggering of the hormones of lactation. The subsequent rise in prolactin hormone causes a state of tranquility in the mother and enables her to sustain the stress of childcare and the additional burden of transition to parental role.

The psychological status of mothers impacts the health and well being of their children in so many ways. Of particular importance is the psychological status of mothers who are breastfeeding, since their infants are passing through a critical stage of their growth and development. Earlier studies have shown the impact of maternal deprivation on the development of inorganic failure to thrive, autism and other forms of cognitive dysfunction. Moreover, mothers who have been exposed to

abuse in their early childhood tend to have high rates of affective disorders as parents^{5,6}.

However during the second year of life it not known whether the psychological benefits of breastfeeding are still present. It is well documented that extended breastfeeding of infants into the second year of life have immunological benefits to the infant whereby protecting the infant from the repeated infective episodes in this period of life⁷. Breastmilk is a good source of calories, protein and micronutrients for children living in deprived conditions. However the effects of continued breastfeeding into the second year on child development and behavior are not clear. Moreover it is not clear whether the psychological status of mothers benefit from the extended breastfeeding. The interaction of factors influencing continuity of breastfeeding into the second year of life make it difficult for us to establish clear cut practices that affect continuity. Use of optimal development as a criterion for optimal feeding practices in that period is not possible since so many factors influence child's development in this period as nutritional status, iron deficiency, exposure to lead, prematurity and breastfeeding practices in the first year, also environmental and socio-cultural factors⁸. Whereas the psychological status of the mother is influenced by many factors such as working status, social support, medication, chronic illness and hereditary tendency to development of affective disorder.

Despite the challenges imposed by such a study we have ventured to examine the relationship between extended breastfeeding into the second year, maternal anxiety and depression scores in mothers and the developmental milestones, behavior and health status of their infants as a guide to optimal breastfeeding duration. Lack of sufficient research concerning breastfeeding in the second year has stimulated this study. Furthermore, the optimal practices and policies that lead to effective breastfeeding during the second year are vague. Many authors tend to suggest feeding recommendations entailing weaning off the breast from 18 months, while

others suggest even one year. This study attempts to highlight the determinants of breastfeeding in this period and paves the way to a better understanding of this rare and unique endowment of nature to mankind, for which we have yet much to learn.

SUBJECTS AND METHODS

Stage I: Qualitative research:

Prior to the study we conducted three focus group discussions with mother-infant pairs in the second year postpartum. The aim of the FG was to design appropriate questionnaire forms for assessing breastfeeding practices, mother-infant interactions and other factors that may be relevant to this community that could be worth considering during the quantitative analysis stage of the study.

Stage II: Quantitative research

Sampling: Selection was done from the pediatric outpatient clinic of Benha fever hospital that is located in an urban regional community of Lower Egypt. The sample consisted of 120 mother infant pairs whose infants were aged 18 to 24 months and were free of any major clinical illness, developmental delay or chronic disability. The cases were selected so that sixty mother infant pair stopped breastfeeding before the first year of life, while the other sixty mother-infant pairs were continuing to breastfeed their infants.

Stage III: Evaluation:

- 1. Interviews:** All mothers were interviewed to assess their socio-demographic background, breastfeeding practices in the first year, mother infant interaction, infant's development and behavior.
- 2. Assessment for Affective trait in the mothers:** The mothers were assessed for depression using the Beck Depression Inventory (BDI)⁹ and for anxiety scores using the STAI for anxiety state and trait¹⁰.
- 3. Assessment of Infants:** The infants were assessed for growth, nutritional status, behavior and development. Growth was

assessed by measurement and charting of weight and supine length measurement to the nearest gram for weight and cm for length according to WHO standard methods for anthropometry¹¹. The charts used were the NCHS/WHO/CDC reference child growth charts for developing countries. The developmental milestones were assessed using the Denver developmental screening test¹² (DDST-R), in which the screener identifies and administers the three items immediately to the left of the age line for a total of 12 items. If any of the items failed or refused this indicates delay or potential delay respectively.

Behavior disorders were diagnosed based on history taking, mother's description of the disorder, and by observation. The child was observed during the visit to assess speech, vision and hearing using the classic tests described for this age, also for mother-infant interactions, behavior, socialization and play.

Stage IV: Statistical Analysis:

This was conducted using a computer software, using chi-square, T-test and one-way ANOVA test.

FINDINGS OF STUDY

The findings were divided in to three major categories:

1. Findings related to the infants' growth, health and nutritional status, developmental milestones' progress and behavior disorders according to the presence or absence of breastfeeding in the 18-24 months aged infants.
2. Findings related to the mother's socio-demographic status, breastfeeding practices, scores for affective trait disorder, of depression and anxiety and their circumcision status according to their continuation of breastfeeding into the second year of their infant's life (group I) or whether they stopped breastfeeding before the first year of life.

3. Findings related to paternal socio-demographic data, support given to mother with child care and house-work, violence with mother in mother-infant pairs who were breastfeeding presently compared to those who had stopped breastfeeding in the first year postpartum.

1) Findings in infants:

- * **Growth:** Mean weight for infants fell within the range of 11.4 - 14.5 kg in group I and 11.5- 13.4 kg in group II. Mean supine length fell within the range of 82.2-86 cm in group I and 82.7-83.4 cm in group II.
- * **Health and nutritional status:** The repeated episodes of diarrhea and respiratory tract infections over three times during the second year were significantly higher in the group II (75%) and (55%) compared to group I (3.3%) and (5%) respectively at $P < 0.001$. However, the mean body mass index (BMI) showed no significant difference between both groups rising from 16.5 to 19.5 between ages 18 to 24 months.
- * **Developmental assessment:** The mean score of the DDST-R for developmental status was 69.7% for group I and 52.53 for group II for personal-social, 64.47% in group I and 55.4% in group II for fine motor, 71.25% in group I and 58.3% in group II for language, and finally 75% in group I and 64.14 in group II. Hence all four categories of development were lower in the group of infants who were deprived of breastfeeding continuation into the second year of life. The difference was statistically significant for communication and personal-social or cognitive development $P < 0.5$.
- * **Behavior disorders** detected included: Pica (13.3%), thumb sucking (10%), temper tantrums (9.16%), sleep disorders (8.3%), titubation (7.5%), head banging (6.8%) and extreme attachment (5.8%). Behavior disorders were significantly higher in group

II (75%) compared to (48.3%) in group I at $P < 0.05$. High mother-infant interaction scores of 5-6 had significantly lower occurrence rates of behavior disorders (1.67%) compared to those with interaction scores of 3-4 and 1-2 of (31.6%) and (28.3%) respectively at $P < 0.05$. High mother-infant interaction scores (MIS) were significantly associated with a higher percent of developmental achievers at $P < 0.0001$ for cognition and communication and 0.003 for gross motor and $P < 0.0002$ for fine motor skills (Figs. 1 & 2).

2) Findings in mothers:

Socio-demographic data: There were no marked differences between mothers in group I and those in group II with regards to age, residence, occupation. However mothers who continued to breastfeed well into the second year of life tended to be more highly educated, 26.7% received university education and 55% secondary education compared to 8.3% and 36.7% in group II, the difference was significant at $P < 0.0002$. Whereas mother who discontinued to breastfeed earlier were mostly primiparous mothers (70%) compared to (40%) in the respective group, with a statistically significant difference at $P < 0.0001$. Most of the infants of mothers with higher education (university and secondary) (93.5%) were free of behavior disorders compared to only 6.5% of infants whose mothers who were of a lower level of education at $P < 0.001$.

Breastfeeding practices:

* Early exclusive breastfeeding at birth:

Mothers who continued to breastfeed well into the second year were introduced no prelacteals or supplements in the first week of post delivery (68%), or nipples in that period compared to group II mothers, whose use of supplements was 56.7% and nipples was 56.7%. The difference was statistically significant at $\chi^2 = 7.6$ $P < 0.005$

for supplements given and $\chi^2 = 19.17$, $P < 0.0001$ for nipples offered.

* **Exclusive breastfeeding during the first 6 months:** More mothers in group I continued to exclusively breastfeed for the first 4 months (36.7%) compared to group II mothers (11.7%) at $\chi^2 = 12.4$, $P < 0.001$. Most mothers in group I introduced no bottles (88.3%) or pacifiers (80%) for the first six months while 58.3% of group II mothers offered bottles $\chi^2 = 28.7$, $P < 0.0001$ and 61.7% offered pacifiers to their infants before six months of age $\chi^2 = 21.5$, $P < 0.0001$. Other milks were introduced to infants before 4 months by 68.3% by group II mothers compared to 33.3% of group I mothers, the difference was significant at $\chi^2 = 14.7$, $P < 0.0001$. Most mothers of both groups had started to introduce foods by 4 months of age (86.7%) of group I and (73.3%) of group II, with no statistical difference between both groups.

* Affective trait disorders in mothers:

Anxiety scores were significantly higher in 84% of group II mothers compared to 16% of group I mothers at $\chi^2 = 12.5$ with $P < 0.0001$. Depression scores tended to be high in both group I mothers (56.52%) and group II mothers (43.48%) at $\chi^2 = 0.7$ with $P = 0.38$. High scores of depression in mothers tended to be correlated with lower scales of cognitive and communication developmental categories in their infants at $P < 0.05$. High anxiety scores were significantly associated with lower developmental scales in the fields of cognition (personal-social) (65.47%) and communication (language) (67.36%) and fine motor (67.89%) in their infants compared to mothers with lower anxiety scores (44%, 48% and 50%

respectively) at $P < 0.05$. All infants whose mothers who had significant scores for depression and anxiety manifested behavior disorders, with 52.1% and 51.15% of occurrence of behavior disorders in mothers with low scores for anxiety and depression respectively, the difference was statistically significant at $P < 0.05$ (Figs. 3, 4, 5, 6, 7 & 8).

3) Findings in fathers as husbands:

- * **Education and Occupation:** The education of husbands whose wives belonged to group I were mostly of secondary and high education (45% and 36.7%) respectively while those in group II were mostly of secondary and primary education, the difference was statistically significant with chi-square of 8.9 at $P < 0.02$. With regards occupation, group I husbands were mostly professional (36.7%), while those in group II were mostly non-professional including; civil servants in 26.7%, manual workers in 20%, and drivers in 21.7%. The difference was not statistically significant.
- * **Husband support with childcare and housework:** Husbands belonging to group I mother-infant pairs were mostly supportive with child care (40%) and housework (36.7%) compared to those of group II husbands who showed support in only 18% and child care in only 11.7% of cases. The difference was statistically significant at chi-square of 12.5 and 5.02 at $P < 0.0001$ and, $P < 0.024$. Husbands who were supportive with childcare and housework were mostly highly educated (50% and 66.7%) and had professional jobs (50 and 62.7%) (chi-square=19.55 and 27.9 at $P < 0.0002$ and $P < 0.0001$ for educational status and Chi-squared 16.75 and 28.45 at $P < 0.002$ and $P < 0.0002$ for occupational status). Marital relations were poor in 41.7% of husbands in group II, compared to 23.3% of husbands in group-I- with chi-square = 10.8 at $P < 0.004$.

Husband was away from the family in 10% of group-I- mother-infant pairs and 13.3% of group II; the difference was not statistically significant. Mother-infant groups whose fathers were supportive in housework (62.2%) and childcare (70.3%), showed high mother-infant interaction scores (5-6) at $P < 0.0001$ and $P < 0.0002$.

- * **Husband Violence:** Violence of husband with wife was observed in only 18.3% of group II compared to none in group I. The difference was statistically significant with a chi-square of 12.1 at $P < 0.002$. Husbands with primary education showed violence with their wife or child in 38.5% with lower levels of violence in the other groups. Manual workers showed the highest percentage of violence compared to other occupations (34.8%), followed by salesmen (22.3%) and civil servants (15.4%) chi-square of 13.8 at $P < 0.08$. Mothers with low mother-infant scores of 1-2 reported that their husbands were violent with them or their children in 50% of cases (chi-square of 42.4 at $P < 0.0001$).
- * **Father educational and occupational status of mothers with affective disorder:** Anxiety scores were high in 38.5% of husbands with primary education and in 37.5% of illiterate husbands ($P < 0.0002$). Depression scores were highest in those whose husbands received only primary education (42.3%) ($P < 0.007$). Husbands of mothers with high anxiety scores were mostly drivers (33.3%), civil servants (26.9%) and manual workers in 26.1%. Husbands of mothers with high depression scores were mostly manual workers (26.1%), civil servants (23%). The relationship between affective disorder in the mother and husband's education was significant but not husband's occupation.
- * **Father educational and occupational status of infants with behavior disorder:** Behavior disorders were high in 96% of husbands with primary education and in

85.7% of illiterate husbands ($P < 0.0001$). Husbands of infants with behavior disorders were mostly manual workers in 95.2%, drivers in 71.4%, and civil servants in 69.2% with a significant test of $P < 0.0001$. The

relationship between behavior disorder in the infant and husband's education and occupation was significant. Fathers' violence with child was reported in 8.3% of group I mother-infant pairs and 6.7% of group II.

Fig. (1): Relationship between mother-infant interaction score and developmental milestones.

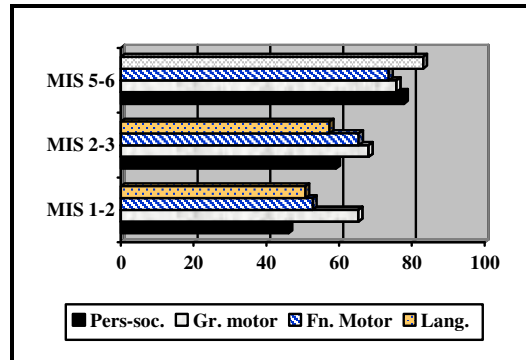


Fig. (2): Relationship between mother-infant interaction scores & presence of behavior disorders.

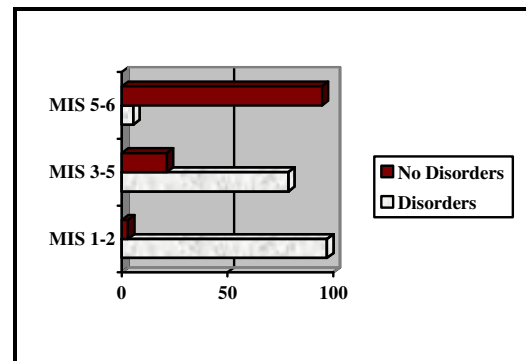


Fig. (3): Relationship between depression scores in mother who continued breastfeeding into the second year (group I) versus those who stopped breastfeeding before 12 months (II).

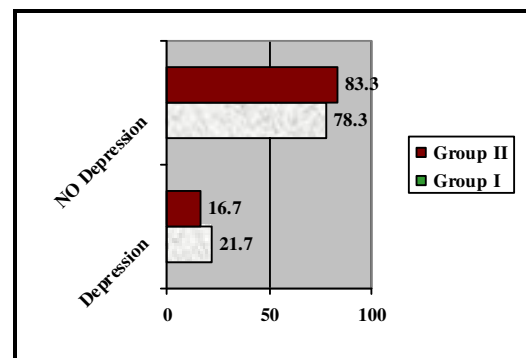


Fig. (4): Relationship between anxiety scores in mother who continued breastfeeding into the second year (group I) versus those who stopped breastfeeding before 12 months (II).

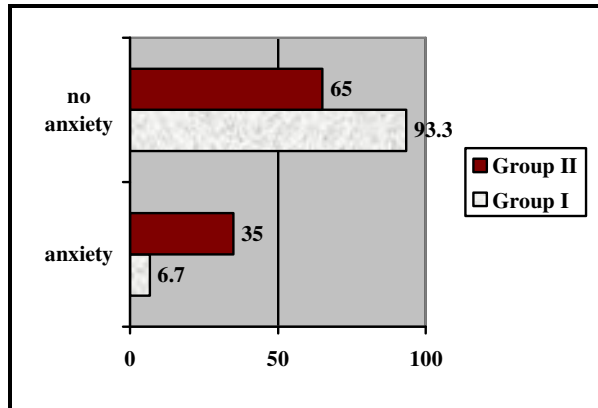


Fig. (5): Relationship between depression scores in mother and development of the child during the second year.

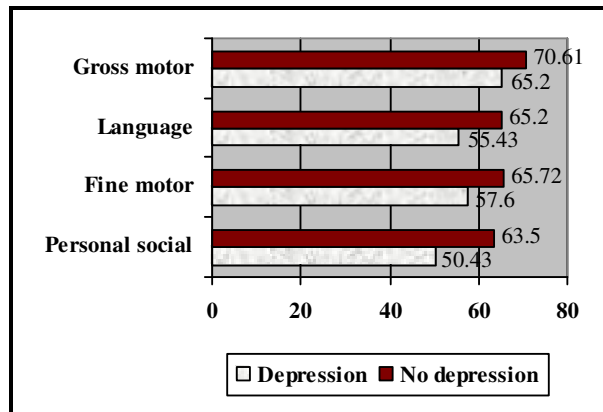
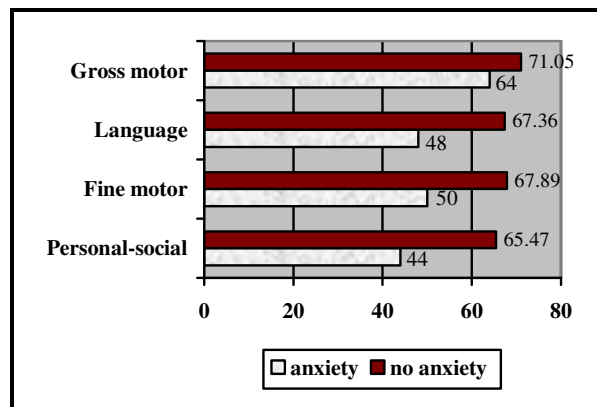


Fig. (6): Relationship between anxiety scores in mother and development of the child during the second year.



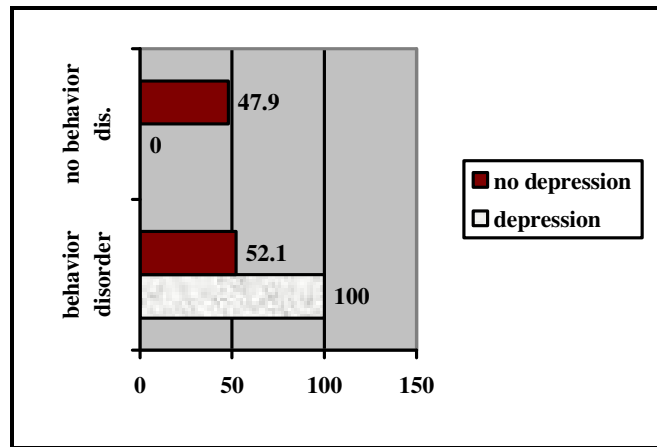


Fig. (7): Relationship between depression scores in mother and behavior disorders among all infants studied during the second year.

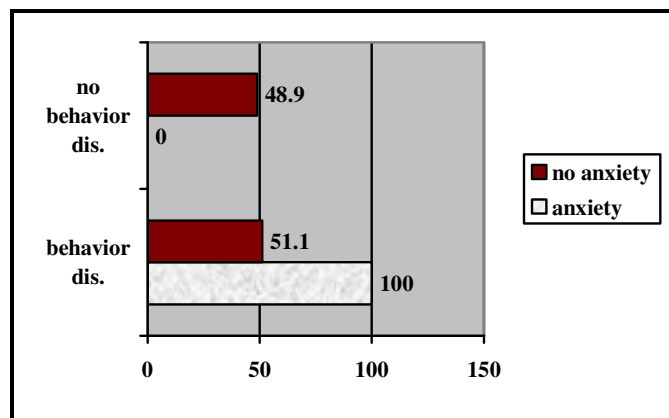


Fig. (8): Relationship between anxiety scores in mother and behavior disorders during the second year.

DISCUSSION

In this study we have shown how continued breastfeeding well into the second year (18 to 24 months) is beneficial to the cognitive and communication aspects of development of infants at that age. We have also shown that the psychological status of mothers and the presence

of affective disorder in the mother in the form of depression or anxiety may be detrimental to the child's development and behavior. Our study is supported by the findings of other workers who have shown superior cognitive development among breastfed infants. The studies of Lucas et al.¹³ have shown that, in preterm infants, mother's choice to provide breast milk was associated with

higher developmental scores at 18 months. They also reported superiority of intelligence quotient (IQ) in the same children seen at 7 1/2-8 years with an 8.3 point advantage in IQ remained even after adjustment for differences between groups in mother's education and social class. Pollock¹⁴, reported that some aspects of intellectual attainment at five and ten years of age can be demonstrated to be inferior among children who were formula-fed compared with those that were exclusively breastfed for at least three months. Gomez-Sanchiz et al.¹, reported that scores on the Bayley Scales of children's abilities were significantly higher as the duration of breastfeeding increased. Morrow-Tlucak et al.², reported a significant difference between bottle-fed children, children breastfed less than or equal to 4 months and those breastfed greater than 4 months using Mental Development Index of the Bayley Scales at ages 1 and 2 years, favoring the breastfed children. Lucas et al.¹³ reported that formula-fed preterm infants had lower Bayley Mental Development scores at 18 months, even after adjusting for social and demographic influence. Oddy et al.¹⁵ and Angelsen et al.¹⁶ showed that cognitive development of breastfed to be superior on the performance on developmental tests at age five years. Fergusson and Woodward³ showed the positive effect of continued breastfeeding on the later psychosocial adjustment during adolescence. Quinn et al.¹⁷, Oddy et al.¹⁵ and Angelsen et al.¹⁶ showed the superior effect of continued breastfeeding on the cognitive development at age one and 5 years.

Our study is also demonstrates the specific effect of continuity of breastfeeding into the second year on the development of behavior disorders. Although it is debatable whether breastfeeding alone or the presence of anxiety too accentuated the occurrence of such disorders among these infants. Fisher and Mitchell¹⁸ describe that some behavior disorders may arise from mother's psychological state and termed it "Munchausen's Syndrome by proxy or factitious illness by proxy".

The continuity of breastfeeding in this study was affected by many factors including education of the mother, social status, and breastfeeding practices after birth and during the first six months of life. Houston¹⁹ demonstrated that the early breastfeeding practices and social class influenced the duration of breastfeeding.

Another significant finding was the high percent of maternal anxiety in those who were not breastfeeding well into the second year. The high percentage of anxiety among those mothers, in this study, could have been attributed to the child's frequent illness, father's violence with mother or child, with superimposed social factors of poverty, low social standards, low levels of education and occupation of father. Also those infants of mothers with high anxiety scores had poor developmental outcomes. Since most of these mothers were also not breastfeeding hence the developmental outcome was due to the combined effect of discontinuation of breastfeeding and maternal anxiety. Depression also had detrimental effects on child development. This has been shown by other workers⁵. However in this study we noticed that the continuation of breastfeeding seemed to modify this effect, since the infants who were breastfeeding had higher scores of development. It may well be that breastfeeding could protect the infant from the hazards of affective disorder in the mother. The mechanism whereby breastfeeding could be protective is not clear, but it could be postulated that high mother-infant interactions present in the group of mothers who continued to breastfeed could be the protective factor. Mothers with affective disorders may avoid interaction with their infants as a stigma of their disorder. However breastfeeding forces them to interact with their infants, thus maintaining continued stimulation of their infants needed for adequate development particularly in the intellectual, social and emotional fields. In another study we have shown through focus group discussions that mothers who are exposed to stress from ill treatment by their extended family members or husband usually found alleviation of their sorrow by playing and interacting with their

children²³. Depression and anxiety are associated with compromises in infant social and emotional functioning and interaction of mother especially among infants who are not breastfed or deprived of early contact at birth with their mothers^{7,24,25,26}.

Fathers played a significant role on the development of the child and the behavior pattern. It is not clear whether his effect was directly on the child, or through his role in supporting the mother in housework and childcare. It was evident that father's support was associated with high mother-infant interaction scores. Fathers who were highly educated or had professional jobs were more understanding to mothers by being cooperative in housework and interactive with their children. Fathers as childcare providers have significant effects on their child development as shown by other workers^{4,20,21,22}. In Egypt studies on early mother satisfaction with care given at delivery and support with breastfeeding from family and health staff have shown the women's needs for informational, psychosocial, tangible and medical care support during the first year after delivery^{23,27}. Tangible support mostly mentioned was that in the form of support with housework and childcare. When their emotional needs from their husbands were not met, they tended to compensate for it by seeking comfort through interactions with their children. Cumulative stress made women respond by being violent with their children. Lacks of husband's emotional support, troubleshooting in-laws were precipitating factors. Husbands probably play a crucial role by supporting mothers during delivery and thereby facilitating bonding and successful breastfeeding²⁸.

It is concluded that support for breastfeeding continuity of breastfeeding into the second year is detrimental for the health, developmental outcome, behavior patterns of infants at that age. Women's health and psychosocial wellbeing needs to be supported as they affect breastfeeding continuity and the health and wellbeing, cognitive and emotional development of their children. Husbands as fathers play important roles in the outcome of their children's health and development by providing the needed tangible and

emotional support for mother for the breastfeeding mothers. Social support can reduce maternal mortality²⁹. Correy³⁰ recommend a comprehensive primary approach to women and family care. We therefore strongly recommend that health care organizations and women support groups should set guidelines or protocols for the support of breastfeeding during the second year of life. A family-centered approach to support of breastfeeding continuity can be highly cost effective and efficient as a strategy for promoting breastfeeding continuity at birth and continuity into the second year. Integration of breastfeeding support with child development, child nutrition and women health care programs in this period may augment the outcome of maternal and child health care programs particularly in developing countries and influence the cognitive and developmental outcome of the Egyptian child^{31,32,33}.

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