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Research Paper

Nursing Intervention for Mothers about Effect of Exclusive Breast-feeding on Health Status of their Infants

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ABSTRACT

Background: *Exclusive breastfeeding is the gold standard in infant nutrition. Exclusive breastfeeding provides all infants nutritional and fluid needs in the first six months.* ***The study aimed to:*** *assess the effect of nursing interventions for mothers about exclusive breast-feeding on health status of their infants.* ***Design:*** *A quasi-experimental research design was utilized.* ***Setting:*** *This study was conducted at selected Maternal and Child Health Centers in Maasara, AinHelwan, HadayekHelwan and El SaitKhadra in Helwan district.* ***Sample:****A purposive sample of 60 mothers and their accompanying infants were attending the previously mentioned settings for the purpose of BCG immunization during the first week of life and were satisfying the inclusive criteria.* ***Tools:*** *The first tool was a structured interviewing questionnaire sheet (was used pre/post nursing intervention) to assessmothers' knowledge and reported practice regarding exclusive breast-feeding, the second tool washealth status assessment and follow-up record sheet(was used pre/post and follow-up nursing intervention) to assess health status of the infants.* ***Results:*** *The study findings revealed that there was highly significant positive correlation (r=0.916, P<0.000) between control group and study group of total health status of infants and there was statistically significant positive correlation (r=0.867, P<0.032) between control group and study group of total infants' growth and developmental patterns.****Conclusion:****Nursing intervention for the studied mothers about exclusive breast-feeding had a positive effect on health status of their infants where there was highly significant positive correlation between both study and control groups of total health status of infants and there was statistically significant positive correlation between pre- and post-nursing intervention of total mothers' knowledge and reported practice regarding exclusive breast-feeding as well as there was positive correlation between total mothers' knowledge and reported practice, total infants' growth and developmental patterns and total health status of infants.****Recommendations:*** *Developing pre- and post-natal nursing intervention for promoting and supporting exclusive breast-feeding should be directed for young and primipara mothers.*

KEY WORDS: *Breast-feeding, Exclusive, Health Status, Infants, Intervention, Mothers, Nursing.*

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INTRODUCTION

The period from birth to two years of age is a "critical window" for the promotion of optimal growth, health, and behavioral development. Some of the consequences of poor nutrition during the first two years of life include significant illnesses, delayed mental, and physical development or even death ***(Abdullah et al., 2016).***

The first six months of life represents a critical period in the survival of the infant. There is high morbidity and mortality risk as the infant with its inherent immunological deficits adapts to the extra-uterine life. Optimal nutrition plays a major role in the survival of infants during their early period of life hence the significance of appropriate feeding practices***(Tagherand Knapp, 2020).***

Exclusive Breastfeeding **(EBF)** has been recognized as an important public health tool for the primary prevention of child morbidity and mortality. Consequently, the World Health Organization **(WHO)** and United Nation International Children's Fund**(UNICEF)** have recommended EBF for the first six months after birth, followed by introduction of complementary foods and continued breastfeeding for 24 months***(Singh and Kalia, 2019).***

Exclusive breastfeeding means that the infant receives only breast milk (either directly from the breast or expressed) and no other liquids or solids are given not even water except of oral rehydration solution or drops/syrups of vitamins, minerals or medicines. WHO and UNICEF recommend initiation of breast-feeding within the first hour of life to enable mothers to establish and sustain EBF for 6 months of life to achieve optimal growth, development, and health.EBF is that the infant only receives breast milk without any additional food or drink, not even water, breast-feeding on demand that is as often as the infant wants, day and night and no use of bottles, teats or pacifiers ***(World Health Organization, 2018).***

Breast milk is a complete food for a normal infant. It is the best gift that a mother can give to the infant. It contains all the nutrients for normal growth and development of the infant from time of birth to the first 6 months of life. The Global Strategy for Infant and Young Child Feeding adopted by the WHO and UNICEF states that the optimal feeding pattern for overall child survival is EBF for the first 6 months and continued breastfeeding for up to 2 years and beyond with complementary feeding from age 6 months together with related maternal nutrition and support ***(Tagherand Knapp, 2020).***

Exclusive breast-feeding has significant health benefits for mothers and infants. For the infant, breastfeeding contributes to reduced infant morbidity and mortality due to diarrhea, respiratory or ear infections, infectious diseases, and non-communicable disease such as obesity, juvenile diabetes mellitus and leukemia during childhood and adulthood of the infant. Moreover, breastfeeding enhances psychomotor and cognitive development, which may lead to better school achievement and later a higher income ***(Cascone et al., 2019).***

Breastfeeding is also related to health outcomes in mother. It expedites the postpartum period and the return to pre-pregnancy weight. In addition to, it decreases the risk of postpartum depression, type II diabetes, metabolic syndrome, and breast and ovarian cancer. In many cases health benefits of breastfeeding are enhanced in accordance with the duration and exclusivity of breastfeeding in the first six months ***(Zielinska et al., 2017).***

The pediatric nurse plays a vital role in promoting and supporting EBF to assess the needs of each mother and then to motivate, encourage, educate, and empower mothers to correctly and safely position and attach the infant to the breast. If positioning and attachment is well supported, the challenges of reduced milk supply and soreness are significantly reduced. Achieving an optimal attachment at the breast is usually the only treatment needed for many breastfeeding challenges. 'Thorough antenatal breastfeeding education and correction of positioning and attachment in the first week after birth would assist in the prevention of nipple damage and subsequent infection'***(Grinspun, 2018).***

Significance of the study

Exclusive breastfeeding offers many benefits for the health of infants and their mothers. However, it is estimated that only 37% of infants under 6 months of age are exclusively breastfed worldwide, a reality that is far from that recommended by WHO, which has established an EBF prevalence goal of 50% by 2025 ***(Monteiro et al., 2017).***

In Egypt, the Egypt Demographic and Health Survey **(EDHS)** 2014 shows that EBF is common but not universal in infancy. Among infants under two months of age, 71% receiving only breast milk. However, the proportion exclusively breastfed drops off rapidly among infants. By age 4-5 months, only 13% of children were exclusively breastfed ***(Kandeel et al., 2018).***

Breast milk is nature's most precious gift to the infant; therefore, promotion of EBF has been a cornerstone of public health measures to promote infant's survival for several years. EBF is associated with reduced infant morbidity(reduced risks of diarrhea and pneumonia) and mortality in both developed and developing world settings***(Akodu and Disu, 2014).***So, from the researcher point of view, it is important to shed light on nursing intervention for mothers about effect of exclusive breast-feeding on health status for their infants.

Aim of the Study

This study aimed toassess the effect of nursing interventions for mothers about exclusive breast-feeding on health status of their infants.

Research Hypothesis

The study was based on the hypothesis that nursing intervention for mothers about exclusive breast-feeding would have a positive effect on health status of infants.

Material and Methods:

Research Design:

A quasi-experimental research design was utilized to achieve the aim of this study.

Study Setting:

This study was conducted at selected Maternal and Child Health **(MCH)** Centers in Helwan district according to predetermined criteria such as MaasaraFamily Health Center, Ain Helwan Family Health Center, HadayekHelwan Family Health Center and El SaitKhadra Family Health Center. Helwan district contains of 12 MCH Center. The researcher selected these four study settings based on systematic random sample.

Study Subjects:

A purposive sample of **60** mothers and their accompanying infants were attending the previously mentioned settings for the purpose of BCG immunization during the first week of life and were satisfying the following inclusion criteria:

- Normal full term healthy infants during first week of life.
- Infants with a normal birth weight ranged from 2.500 to 3.850 grams.
- Exclude infants who have any congenital abnormality and acute/chronic illness.

Then the infants were divided equally into 2 equal study and control groups. Both groups were subjected to routine MCH care while the nursing intervention was implemented only to the mothers in study group.

The researcher compared between control and study groups regarding physical, physiological growth, developmental pattern, and health status and also, the researcher compared between total level of the studied mothers' knowledge and reported practice regarding EBF before and after nursing interventions.

Tools of Data Collection:

Two tools were used to collect data as the following:

Tool (1): A structured Interviewing Questionnaire Sheet: **(was used pre nursing intervention)**

Structured Interviewing Questionnaire Sheet that was designed by the researcher after reviewing the current available literature and was written in simple Arabic language to suit level of understanding of mothers to assess the following:

Part I: It was comprised of the following:

a- **Characteristics of mothers** namely; age, level of education, place of residence, marital status, occupation, family income, number of previous child bearing, and number of living children.

b- **History of previous infant feeding patterns**

c- **Current infant feeding pattern** namely; time of initiation, colostrum feeding, frequency per day, duration, feeding on demand or on o'clock, and breast-feeding pattern).

Part II:

Mothers' knowledge and reported practice of both study and control groups regarding EBF: (was used pre/post nursing intervention) for knowledge, definition of EBF, breast care before breast feeding, duration of EBFF, benefits of EBF for infant, mother, family, and society, causes of early discontinuation of EBF, mothers beliefs regarding breast-feeding, mothers beliefs regarding benefits of artificial milk, contraindications for EBF. For reported practice, proper breast-feeding practices that were adapted from **Verma et al., (2015)** to assess the studied mothers reported practice before, during, and after breast-feeding.

Scoring system

Items of mothers' knowledge regarding EBF consisted of closed ended questions. According to mothers' responses, each question is checked either correct (1 score) or incorrect (zero). While some questions are checked either complete correct answer (2 score) or incomplete correct answer (1 score) or do not know (zero). Scoring was converted from degree to percentage and accordingly the studied mothers' knowledge was categorized into two levels: unsatisfactory (<60%) and satisfactory (≥60%), and accordingly the studied mothers' reported practice, each step was checked either done (1 score) or not done (zero). Then the studied mothers' total practice was categorized into two levels: incompetent (<80%) and competent (≥80%).

Part III:

Infant s' characteristics such as; age, sex, birth weight, mode of delivery, place of delivery, ranking between siblings, and exposure to any complications during delivery.

Tool (2): Health Status Assessment and Follow-up Record Sheet: (was used pre/post and follow-up nursing intervention for study and control groups)

Health Status Assessment and Follow-up RecordSheet that was designed by the researcher after reviewing the current available literature and composed of the following parts:

Part I: Infants' Growth Chart

Infants' physical measurements (infant weight, length, head and chest circumference) that were measured and recorded using growth chart. Results compared with peers.

Part II:Infants' physiological measurements(temperature, pulse, and respiration) and compared with peers.

Part III:Development of infants(dentition, motor, cognitive, social, and emotional development) and compared with peers.

Scoring system:

Regarding infants physical and physiological measurements, each statement was answered by "normal" or "abnormal" according to normal developmental milestone. The item was scored zero if the answer is "abnormal" and one if the answer is "normal". The total score ranged from 0:24. Regarding to infant's developmental pattern, each statement was answered by "yes" or "no". The item was scored zero if the answer is "no" and one if the answer is "yes". The total score ranged from 0:16. Scoring was converted from degree to percentage and then was categorized into three levels:high development (≥85%), moderate development (75<85%) and low development (< 75%).

Part IV:Health Status Assessment & Follow-up Record Sheet

Health Status Assessment &Follow-up Recorded Sheet was designed by the researcher after reviewing the current available literature to assess health status of the infants that affect different body systems such as gastrointestinal system (fever, vomiting, diarrhea, constipation, abdominal distension, dehydration, and abdominal colic), respiratory system (pneumonia, tachypnea, bronchitis, otitis media, sore throat, tonsillitis, and croup) and communicable diseases that affect respiratory system, gastrointestinal system, nervous system, skinand lymph nodes and nutritional disorders due to under-nutrition, mal-nutrition, and over-nutrition.

Scoring system:

Regarding infants' health status, each statement was answered by "yes" or "no". The item was scored zero if the answer is "no" and one if the answer is "yes". The total score ranged from 0:156 degree. Scoring was converted from degree to percentage and then was categorized into two levels:good health (≥75%) and poor health (< 75%).

Content Validity and Reliability:

The revision of the tools for clarity, relevance, comprehensiveness, understanding, and applicability was ascertained by a panel of 3 experts in pediatric nursing specialty from Faculty of Nursing, Ain shams University and Faculty of Nursing, Helwan University to assess the content validity of the tools. Their opinions were elicited regarding the format, layout, consistency, accuracy, and relevancy of the tools and the necessary modifications were done accordingly. Internal consistency and reliability were performed by using Cronbach's alpha- coefficient test.

Scales	Cronbach's Alpha
Mothers' knowledge regarding EBF.	0.854
Mothers' reported practice regarding EBF.	0.853
Development of infants.	0.728
Health Status Assessment & Follow-up Record Sheet.	0.697

Pilot Study:

It was carried out on 10% **(6)** of mothers and their accompanying infants at the previously mentioned settings to test the applicability, clarity, and efficiency of the tools and then the necessary modifications of the tools (paraphrasing of some questions)were done according to the results of pilot study. The pilot study had also served to estimate the time needed for each subject to fill the study tools for data gathering purpose. Mothers and their accompanying infants under pilot study were excluded from the main study sample.

Field Work

To carry out the study, an approval was obtained from the medical and nursing directors of each previously mentioned study setting to carry out the study. The actual field work was carried out in the first of September (2019) up to the end of February (2020) for data collection and designing the program and its implementation. Filling in the study tools was conducted at the waiting area of the previously mentioned study settings in the specific days for BCG vaccination (Saturday and Tuesday) at morning shift to collect data and implement this study.

The researcher first met with the mothers and their accompanying infants attended to the previously mentioned settings. The researcher introduced herself to the mothers. Then, the mothers were interviewed individually using the previously tools in the predetermined settings. The aim of the study was simply explained to the mothers of infants who agree to participate in the study.

Nursing intervention program phases:

I. Assessment phase (the first phase):

At the first week, the researcher stayed with each mother individually about 15-30 minutes to fill the study tools by the researcher. The researcher asked mothers if had any questions to answer them. After that the researcher analyzed it to assess their needs and knowledge deficit.

II. Planning phase (the second phase):

According to the initial assessment, the content of the nursing intervention program was designed. Nursing intervention program was developed by the researcher based on the actual educational need assessment of the studied mothers. The nursing intervention was developed after reviewing the related literatures. The content of the nursing intervention program was developed for the studied mothers and written in a simple Arabic language. Furthermore, nursing intervention program met the mothers' needs and their level of understanding. This program booklet covered the knowledge and practice related to exclusive breastfeeding. The program booklet was developed to be a guide and a reference for the studied mothers.

III. Implementation phase (the third phase):

The nursing intervention program was designed to provide the studied mothers with cognitive knowledge, psychomotor skills and gain positive attitude toward the effect of exclusive breast-feeding on health status of their infants.

Nursing intervention program was carried out at the previously mentioned settings. The subject's materials used had been sequenced through 8 sessions that were divided into 6 sessions for theory and 2 sessions for practice. These mothers were divided into groups, each group consisted of 5 mothers and the nursing intervention was implemented for each group separately (2 days/week). The mothers were motivated and rewarded for their active participation during nursing intervention program.

The program lasted for 5 months in addition to one month for pre-test and post-test. The duration of each session was ranged from 30-45 minutes according to physical and mental readiness of the studied mothers using different teaching strategies as (lecture, role play, small group discussion, demonstration, and re-demonstration). Sessions started at 11 am as it was a suitable time for most mothers.

The total number of groups was 6 groups (5 mothers for each group). Each mother of 30 mothers (study group) took 8 sessions. Each teaching session lasted for 30-45 minutes: 8 sessions × 6 groups= 48 sessions × ¾ hour= 36 hours for the entire study group.

Evaluation phase (the fourth phase):

Upon the completion of the nursing intervention program, the post-test was done to evaluate the outcomes of the program using the same pre-program test. Health Status Assessment and Follow-up Recorded Sheet was used once before nursing intervention to determine infants' growth pattern and health status before the nursing intervention and the same tool was used at 2 months, 4 months, and 6 months after giving the nursing intervention in order to determine the effect of nursing intervention for mothers about exclusive breast-feeding on health status of their infants.

Ethical Considerations

Prior study conduction, ethical approval was obtained from the Scientific Research Ethical Committee of Faculty of Nursing, Helwan University, the researcher clarified the aim of the study to mothers included in the study, and mothers' verbal approval was a prerequisite to recruit their infants in the study. They were assured also that all the gathered data were used for the research purpose only and the study is harmless. Also they were allowed to withdraw from the study at any time without giving the reason. Confidentiality of the gathered data and results were secured.

Statistical Design:

Data collected from the studied sample were revised, coded, and entered using PC. Computerized data entry and statistical analysis were fulfilled using the Statistical Package for Social Sciences **(SPSS)** version 25as used to estimate the statistical significance difference between variables of the study. Data were presented using descriptive statistics in the form of frequencies and percentages.Quantitative data were presented in the form of

$\bar{x} \pm SD$. Qualitative variables were compared using chi-square test (X2) to compare between two qualitative variables. Statistical significant was considered at p-value <0.05. Highly statistical significance was considered at p-value < 0.001.

RESULTS:

Table (1): Distribution of the mothers according to their characteristics (n= 60).

Mothers' Characteristics	Study group (n=30)		Control group (n=30)	
	Number (No)	Percentage (%)	Number (No)	Percentage (%)
Age in years				
18: <20	6	20.0	4	13.3
20: < 30	18	**60.0**	17	**56.7**
30: ≤ 40	6	20.0	9	30.0
$\bar{x} \pm SD$	**26.47 ±5.353**		**27.33 ± 5.155**	
Educational level				
Illiterate	1	3.3	3	10.0
Primary	4	13.3	2	6.7
Preparatory	2	6.7	1	3.3
Secondary	16	**53.3**	15	**50.0**
University	7	23.4	9	30.0
Residence				
Urban	18	**60.0**	22	**73.3**
Rural	12	40.0	8	26.7
Marital status				
Married	27	**90.0**	29	**96.7**
Divorced	2	6.7	1	3.3
Widow	1	3.3	0	0.0
Occupation				
Housewife	24	**80.0**	19	**63.3**
Work	6	20.0	11	36.7
Family income				
Satisfactory	15	**50.0**	18	**60.0**
Unsatisfactory	15	50.0	12	40.0

Table (1) showed mothers' characteristics, this table revealed that; more than half (60% and 56.7%) of the mothers in both study and control groups were in the age group of 20: < 30 years, with $\bar{x} \pm SD$ 26.47 ± 5.353, 27.33 ± 5.155 years respectively, more than half (53.3% and 50%) of them were secondary school respectively, more than half (60% and 73.3%) of them were from urban residence respectively. The great majority (90% and 96.7%) of them were married respectively, more than half (80% and 63%) of them were housewives respectively and half and more (50% and 60%) of them were satisfied with family income respectively.

Table (2): Distribution of the infants according to their characteristics (n=60).

Infants' Characteristics	Study group n=30		Control group n= 30	
	No	%	No	%
Age in days				
1: < 3	2	6.7	4	13.3
3: < 5	23	**76.6**	17	**56.7**
5: ≤ 7	5	16.7	9	30.0
$\bar{x} \pm SD$	**4.13±1.358**		**4.50 ±1.717**	
Gender				
Male	19	**63.3**	10	33.3
Female	11	36.7	20	**66.7**
Ranking				
First	12	**40.0**	14	**46.6**
Second	7	23.3	6	20.0
Third	4	13.3	6	20.0

Fourth	5	16.7	2	6.7
Fifth or more	2	6.7	2	6.7
Mode of delivery				
Normal vaginal delivery	11	36.7	8	26.7
Cesarean section	19	**63.3**	22	**73.3**
Place of delivery				
Governmental hospital	13	**43.3**	10	33.3
Private hospital	5	16.7	9	30.0
Private clinic	12	40.0	11	**36.7**
Any complications during delivery				
Yes	1	3.3	1	3.3
No	29	**96.7**	29	**96.7**

Table (2) and regarding infants' characteristics, it was indicated that 76.6% and 56.7% of the infants in both study and control groups were having 3: < 5 days with $\bar{x} \pm SD$ 4.13 ± 1.358, 4.50 ± 1.717 days respectively, about two thirds (63.3%) of the infants in study group were male while more than two thirds (66.7%) of the infants in control group were female, more than one third (40% and 46.6%) of the infants in both study and control groups were the first son respectively, more than half (63.3% and 73.3%) of the infants in both study and control groups were delivered by cesarean section respectively, more than one third (43.3%) of the infants in study group weredelivered in governmental hospitals while more than one third (36.7%) of the infants in control group weredelivered in private clinic and the great majority (96.7% and 96.7%) of theinfants in both study and control groups were born without complications respectively.

Table (3): Distribution of mothers according to history of previous infant' feeding pattern (n= 60)

Items	Study group n=30		Control group n=30	
	No	%	No	%
History of previous infants feeding pattern				
Exclusive breastfeeding	9	30.0	2	6.7
Non-exclusive breastfeeding	7	23.3	13	43.3
Formula feeding	2	6.7	1	3.3
Primipara mother	12	**40.0**	14	**46.7**

Table (3) regarding history of previous infant feeding pattern, this table illustrated that more than one third (40% and 46.7%) of the mothers in both study and control groups were primigravida and were not having history of previous infant feeding pattern respectively.

Table (4): Distribution of the mothers according to current infant feeding pattern, time of initiation of breast-feeding and give colostrum feeding (n= 60)

Items	Study group n=30		Control group n=30		X^2	P-Value
	No	%	No	%		
Current infant feeding pattern						
Exclusive breast-feeding	26	**86.6**	0	0.0	5.370	**0.02***
Non-exclusive breast-feeding	4	13.4	26	**86.6**		
Formula-feeding	0	0.0	4	13.4		
Time of initiation of breast-feeding						
Immediately after delivery	11	36.7	5	16.7	21.584	**0.001***
Within1:24 hrs. after delivery	15	**50.0**	14	**46.6**		
After 24 hrs. from delivery	4	13.3	9	30.0		
Artificial milk immediately after delivery	0	0.0	2	6.7		
Give colostrum feeding						
Yes	29	**96.7**	21	**70.0**	2.414	0.12
No	1	3.3	9	30.0		

(*) Statistically significant difference at p<0.05

Table (4) regarding current infant feeding pattern, it was stated that 86.6% of the mothers in study groupwere feed their infants EBF as compared with 86.6% of the mothers in control group were feed their infants non-exclusive breast-feeding. 50% of the mothers in study group were initiated breast-feeding within1:24 hrs after delivery and 46.6% of the mothers in control group were initiated feeding within1:24 hrs after delivery. 96.7% of the infants in study group were received colostrum feeding as compared with 70% of the infants in control group were received colostrum feeding.

Table (5): Distribution of total score level of the studied mothers' knowledge regarding EBF (pre/post nursing intervention) (n=30)

Total score level of mothers' knowledge about exclusive breastfeeding	Pre- intervention		Post- intervention		X2	P-value
	No	%	No	%		
Satisfactory ≥ 60	12	40.0	26	**86.7**	**0.985**	**0.004***
Unsatisfactory < 60	18	**60.0**	4	13.3		

(*) Statistical significance difference, P<0.05.

Table (5) revealed that there was statistically significant difference between the studied mothers' knowledge pre- and post-nursing intervention. It was noticed that more than half (60%) of the studied mothers had unsatisfactory knowledge regarding EBF in pre-nursing intervention. On the other hand, it was observed that most (86.7%) of them had satisfactory knowledge regarding EBF in post-nursing intervention.

Table (6): Distribution of the studied mothers' reported practice regarding preparation of breast-feeding (pre/post nursing intervention) (n=30)

Preparation of breastfeeding		Pre- intervention		Post- intervention		X^2	P-value
		No	%	No	%		
1- Hand washing with soap and water.	**Done**	3	10.0	25	**83.3**	1.159	0.282
	Not done	27	**90.0**	5	16.7		
2- Wash breasts with warm water.	**Done**	10	33.3	25	**83.3**	12.000	**0.001***
	Not done	20	**66.7**	5	16.7		
3- Sit in a comfortable position with your back brace.	**Done**	11	36.7	25	**83.3**	3.474	0.062
	Not done	19	**63.3**	5	16.7		
4- Avoid restricted clothes.	**Done**	4	13.3	27	**90.0**	0.455[a]	0.500
	Not done	26	**86.7**	3	10.0		
5- Observe breast (full, soft, and rounded, no skin redness).	**Done**	12	40.0	24	**80.0**	11.634	**0.020***
	Not done	18	**60.0**	6	20.0		
6- Avoid nipples (prominent, not cracked or bruised).	**Done**	14	46.7	22	**73.3**	1.137[a]	0.286
	Not done	16	**53.3**	8	26.7		
7- Wake up infant before breast-feeding.	**Done**	9	30.0	25	**83.3**	4.641[a]	**0.031***
	Not done	21	**70.0**	5	16.7		
8- Keep infant is lying in comfortable position.	**Done**	8	26.7	23	**76.7**	8.704	**0.013***
	Not done	22	**73.3**	7	23.3		

(*) Statistically significant difference at p<0.05.

Table (6) clarified that there was statistical significance difference between the studied mothers' reported practice regarding preparation of breast-feeding in pre- and post-nursing intervention where the studied

mothers' had competent preparation of breast-feeding reported practice post-nursing intervention (P-value=0.001**).

Table (7): Distribution of the studied mothers' reported practice regarding breast-feeding (latching on) (pre/post nursing intervention) (n=30)

Latching on during breast-feeding		Pre- intervention		Post- intervention		X^2	P-value
		No	%	No	%		
1- Observe infant to have a normal skin color, alert, and waking for feeds.	**Done**	11	36.7	28	**93.3**	1.241	0.265
	Not done	19	**63.3**	2	6.7		
2- Maintain eye to eye contact and talk with infant.	**Done**	13	43.3	26	**86.7**	7.846[a]	**0.005***
	Not done	17	**56.7**	4	13.3		
3- Keep infant reaches for the breast, roots open wide, tongue movement explores the breasts.	**Done**	15	**50.0**	18	**60.0**	8.889	**0.003****
	Not done	15	50.0	12	40.0		
4- Keep infant's body straight, head extended and slightly elevated.	**Done**	23	**76.7**	25	**83.3**	10.770	**0.001***
	Not done	7	23.3	5	16.7		
5- Make infant's lips hold nipple and start to suck.	**Done**	18	**60.0**	25	**83.3**	1.000	0.317
	Not done	12	40.0	5	16.7		
6- Observe that breast-feeding promotes mother and infant bonding.	**Done**	10	33.3	26	**86.7**	2.308	0.129
	Not done	20	**66.7**	4	13.3		

(*) Statistically significant difference at p<0.05.
(**) High statistically significant difference at p<0.05

Table (7) clarified that there was highly statistical significance difference between the studied mothers' reported practice regarding breast-feeding (latching on) in pre- and post-nursing intervention where the studied mothers' had competent breast-feeding (latching on) reported practice post-nursing intervention (P-value=0.003**).

Table (8): Distribution of the studied mothers' reported practice during breast-feeding (pre/post nursing intervention) (n=30)

During breast-feeding		Pre- intervention		Post- intervention		X^2	P-value
		No	%	No	%		
1- Keep infant is held close to the mother's body.	**Done**	8	26.7	28	**93.3**	0.779	0.377
	Not done	22	**73.3**	2	6.7		
2- Infant stays attached, does not slip off.	**Done**	10	33.3	26	**86.7**	1.678	0.195
	Not done	20	**66.7**	4	13.3		
3- Keep infant calm and alert, though eyes may close towards end of feed**.**	**Done**	6	20.0	27	**90.0**	0.076	0.783
	Not done	24	**80.0**	3	10.0		
4- Observe infant's mouth is moist, and infant feels with satisfaction**.**	**Done**	6	20.0	25	**83.3**	16.500	**0.000****
	Not done	24	**80.0**	5	16.7		
5- Lower lip curled out, no heard sound from mouth**.**	**Done**	7	23.3	24	**80.0**	2.727	0.099
	Not done	23	**76.7**	6	20.0		
6- Slow deep sucks, bursts with pauses.	**Done**	8	26.7	25	**83.3**	2.182	0.140
	Not done	22	**73.3**	5	16.7		

7- Rhythmic swallowing seen and heard.	**Done**	9	30.0	27	**90.0**	1.212	0.271
	Not done	21	**70.0**	3	10.0		
8- Infant releases breast spontaneously at the end of feed.	**Done**	10	33.3	26	**86.7**	1.678	0.195
	Not done	20	**66.7**	4	13.3		

(*) Statistically significant difference at p<0.05.

Table (8) clarified that there was highly statistical significance difference between the studied mothers' reported practice during breast-feeding in pre- and post-nursing intervention where the studied mothers' had competent reported practice during breast-feeing post-nursing intervention (P-value=0.000**).

Table (9): Distribution of the studied mothers' reported practice after breast-feeding (pre/post nursing intervention) (n=30)

Reported practice after breast-feeding		Pre- intervention		Post- intervention		X^2	P-value
		No	%	No	%		
1. Observe milk in the infant's mouth and around the nipple.	**Done**	7	23.3	29	**96.7**	3.599	**0.05***
	Not done	23	**76.7**	1	3.3		
2. Keep nipple intact, normal shape and color.	**Done**	9	30.0	25	**83.3**	19.714	**0.000****
	Not done	21	**70.0**	5	16.7		
3. Observe areola. No bruising or compression marks.	**Done**	4	13.3	24	**80.0**	2.981	0.084
	Not done	26	**86.7**	6	20.0		
4. Keep infant is satisfied and secured.	**Done**	6	20.0	25	**83.3**	0.932	0.334
	Not done	24	**80.0**	5	16.7		
5. Burb the infant after breast-feeding.	**Done**	4	13.3	25	**83.3**	19.714	**0.000****
	Not done	26	**86.7**	5	16.7		
6. Place the infant in right side position after breast-feeding.	**Done**	9	30.0	27	90.0	10.952	**0.001****
	Not done	21	**70.0**	3	10.0		
7. Observe infant has at least 6 wet nappies in 24 hours.	**Done**	5	16.7	24	80.0	2.283	0.131
	Not done	25	**83.3**	6	20.0		
8. Observe infant has at least 2 wet nappies in 24 hours where meconium changes from black, green to yellowish stool after 4 days from birth.	**Done**	8	26.7	27	**90.0**	3.688	**0.048***
	Not done	22	**73.3**	3	10.0		
9. Monitor infant weight gain 20-35 gram/day during first 4 months.	**Done**	5	16.7	26	**86.7**	15.165	**0.000****
	Not done	25	**83.3**	4	13.3		
10. Monitor infant weight gain 85 gram/week during first 4-6 months.	**Done**	7	23.3	24	**80.0**	2.981	**0.084**
	Not done	23	**76.7**	6	20.0		

(*) Statistically significant difference at p<0.05.
(**) High statistically significant difference at p<0.05

Table (9) clarified that there was highly statistical significance difference between the studied mothers' reported practice after breast-feeding, in pre- and post-nursing intervention where the studied mothers' had competent reported practice after breast-feeing post-nursing intervention (P-value=0.000**).

Table (10): Distribution of total score level of mothers' reported practice regarding EBF (pre/post nursing intervention) (n=30)

Total score level of mothers' reported practice regarding EBF	Pre-intervention		Post-intervention		X^2	p-value
	No	%	No	%		
Competent	7	23.3	**26**	**86.7**	**12.298**	**0.01***
Incompetent	**23**	**76.7**	4	13.3		

(*) Statistically significant difference at p<0.05

Table (10) revealed that there was statistically significant difference between the studied mothers' reported practice pre- and post-nursing intervention. It was noticed that more than three quarters (76.7%) of the mothers in study group were incompetent regarding EBF pre-nursing intervention. On the other hand, it was observed that most (86.7%) of them were competent regarding EBF post-nursing intervention.

Figure (1):- Distribution of total score level of infants' developmental pattern (n=60).

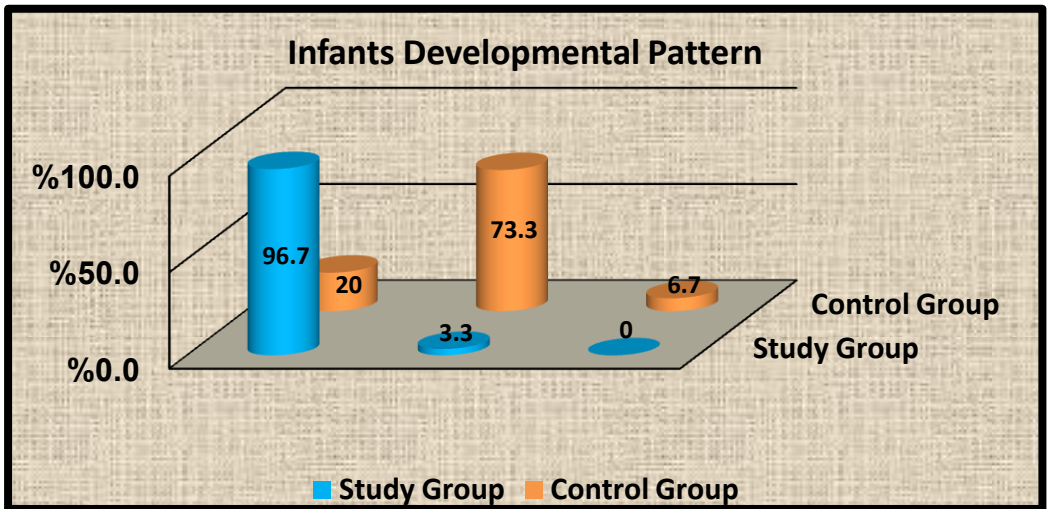

Figure (1) revealed that there was statistically significant difference between the infants in both study and control groups regarding their total developmental pattern. It was noticed that the great majority (96.7%) of the infants in study group had high development. On the other hand, it was observed that about three quarters (73.3%) of the infants in control group had moderate development.

Figure (2):- Distribution of total score level of infants' health status in both study and control groups (n=60).

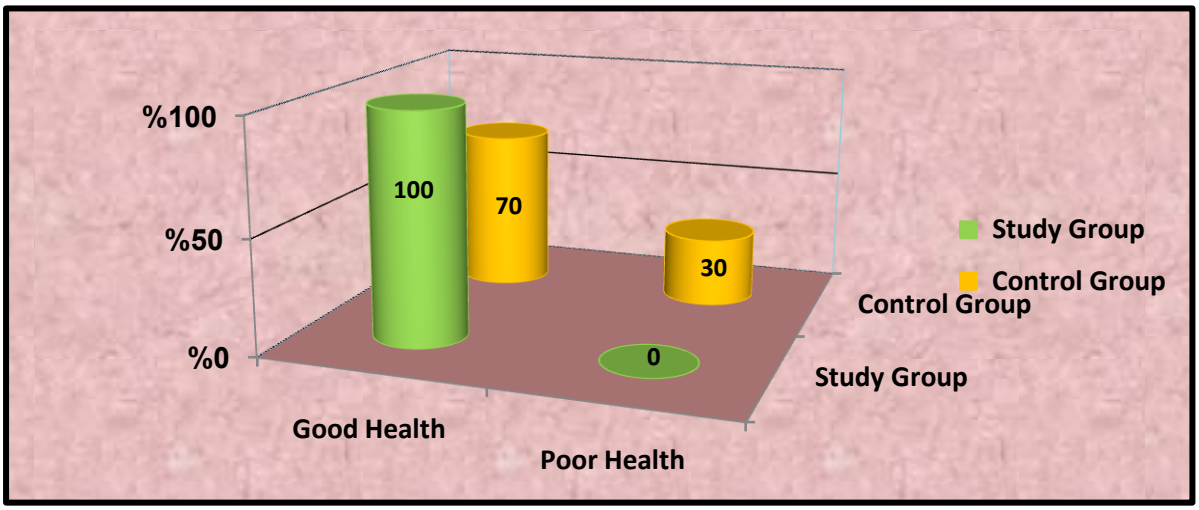

Figure (2) indicated that there was highly statistically significant difference between infants in both study and control groups regarding total health status.

Table (11):- Relation between total level of studied mothers' knowledge about EBF and their characteristics (n=30).

Mothers' Characteristics	Total score level of the studied mothers' knowledge about exclusive breastfeeding					
	No	%	Pre -intervention		Post –intervention	
			X2	P-value	X2	P-value
Age in years						
18: >20	6	20.0	1.488	> 0.05	0.649	> 0.05
20: > 30	18	**60.0**				
30: ≥ 40	6	20.0				
Educational level						
Illiterate	1	3.3	0.144	> 0.05	1.011	> 0.05
Primary	4	13.3				
Preparatory	2	6.7				
Secondary	16	**53.3**				
University	7	23.4				
Residence						
Urban	18	**60.0**	0.153	> 0.05	0.626	> 0.05
Rural	12	40.0				
Marital status						
Married	27	**90.0**	1.084	> 0.05	0.842	> 0.05
Divorced	2	6.9				
Widow	1	3.3				
Occupation						
Housewife	24	**80.0**	- 0.653	> 0.05	-1.895	> 0.05
Work	6	20.0				
Family income						
Satisfactory	15	**50.0**	- 0.784	> 0.05	1.489	> 0.05
Unsatisfactory	15	50.0				

No Statistically significant difference at P> 0.05.

Table (11) clarified that there was no statistically significant difference between total level of studied mothers' knowledge about EBF and their characteristics at p> 0.05.

Table (12):- Correlation between pre- and post- nursing intervention of total mothers' knowledge and reported practice regarding EBF

Total mothers' knowledge and reported practice regarding EBF	Post- intervention	
	r test	P-Value
Pre- Intervention	**0.985**	**0.004***

(*) Statistically significant difference at p<0.05

Table (12) illustrated that there was statistically significant positive correlation (r=0.985, P<0.004) between pre- and post-nursing intervention of total mothers' knowledge and reported practice regarding EBF.

Table (13):- Correlation between control group and study group of total health status of infants

Total health status of infants	Control group	
	r test	P-Value
Study group	0.916	0.000**

(*) Statistically significant difference at p<0.05
(**) High statistically significant difference at p<0.05

Table (13) indicated that there was high statistically significant positive correlation(r=0.916, P<0.000) between study and control groups of total health status of infants.

Table (14):- Correlation between total mothers' knowledge and reported practice, total infants growth and developmental patterns and total health status ofinfants

Post test		Total mothers' knowledge reported and practice	Total infant' growth and developmental patterns	Total health status of infants
Total mothers' knowledge and reported practice	r test	_	0.553	0.754
	P – value	_	0.002*	0.060
Total infants' growth and developmental patterns	r test	0.553	_	0.450
	P – value	0.002*	_	0.013*
Total health status of infants	r test	0.754	0.450*	_
	P – value	0.060	0.013	_

(*) Statistically significant difference at p<0.05

Table (14) illustrated that there was positive correlation (r 0.553, p=0.002) between total mothers' knowledge and reported practice, total infant growth and developmental patterns and total health status of infants.

DISCUSSION

Regarding the mothers' characteristics, the findings of the current study **(table 1)** revealed that more than half of the mothers in both study and control groups were in the age group of 20:< 30 years. These findings were similar to some extent to an Indian study by ***Bhanderi et al., (2019),***which entitled "Barriers to exclusive breast-feeding in rural community of central Gujarat, India" which revealed that the mean age of the studied mothers was 24.6 years ± 3.5. From the researcher point of view, this similarity may be due to the age of marriage and having children is nearly similar in the study settings.

As regards mothers' educational level, the findings of the current study illustrated that more than half of the mothers in both study and control groups were secondary school level. These findings came in line with thestudy of ***Ndikom et al., (2020),***in Nigeria which was entitled "Breast-feeding education and exclusive breast-feeding practices among mothers in Ibadan, Oyo State, Nigeria" and revealed that about two thirds of the studied mothers were secondary school. However, these findings contradicted with the findings of the study of ***Dwinanda et al., (2018),*** in Jakarta, Indonesia, entitled "Factors affecting exclusive breast-feeding in term infants" which stated that more than two thirds of the studied mothers were high educational level. From the researcher point of view, these differences may be due to more educated mothers make better use of health services and provide better infant care including breast-feeding.

Regarding mothers' residence, the findings of the current study clarified that more than half and about three quarters of the mothers in both study and control groups were from urban residence. Although this contradicts with the findings of the study of ***Hassan et al., (2020),***in a similar Egyptian study entitled "Breast-feeding knowledge and practices among primiparous women with caesarean section: impact on breast engorgement in Upper Egypt" which stated that more than half of the studied sample were from rural areas. From the researcher's point of view, these differences may be due to differences in the study setting.

The findings of the present study clarified that the great majority of the mothers in both study and control groups were married. These findings were similar with the study of ***Ndikom et al., (2020),***which revealed that 92% of the studied mothers were married.

Regarding mothers' occupation, the findings of the current study stated that, more than three quarters and about two thirds of the mothers in both study and control groups were housewives respectively, half and more of the mothers in both study and control groups were satisfied with family income respectively. These findings were supported by the study of ***Pokhrel et al., (2018),***in western Bhutan, entitled "Factors associated with exclusive breast-feeding practices in western Bhutan" which revealed that two-thirds of the mothers were housewives. The findings of the current study also came in line with the study of**Sari (2016),** in Indonesia, which was entitled "Lack of exclusive breast-feeding among working mothers in Indonesia" and revealed that most women in Indonesia did not work. From the researcher's point of view, these findings may have been due to the lower educational level of non-working mothers.

Regarding infants' characteristics, the current study **(table 2)** indicated that more than three quarters and more than half of the infants in both study and control groups were having 3:<5 days respectively, about two thirds of the studied infants were male while more than two thirds of the infants in control group were female, more than one third of the infants in both study and control groups were the first son, more than half and about three quarters of the infants in both study and control groups were delivered by cesarean section respectively, more than two fifths of the infants in study group weredelivered in governmental hospitals while more than one third of the infants in control group weredelivered in private clinic and the great majority of the infants in both study and control groups were born without complications.

These findings were emphasized by ***Alzaheb (2017)***, in the study entitled "Factors influencing exclusive breast-feeding in Tabuk, Saudi Arabia" where it was stated that 45.7% of the 589 infants in the research were female, and 54.3% were male.Although this contradicts with the findings of the study of ***Pokhrel et al., (2018),***in western Bhutan, which stated that, 77.7 % of the studied infants weredelivered normal and 98.2% weredelivered in medical centers.Although this contradicts with the findings of the study of ***Nishimura et al., (2018),***which revealed that, 52.1% of non-exclusive breast-feeding infants were delivered normal and 54.9% of them were delivered at home. From the researcher's point of view, this may be due to prevailing cultural beliefs and social standards in oriental communities, which have a bias toward males.

Regarding history of previous infant feeding pattern, the findings of the current study **(table 3)** showed that more than one third of the mothers in both study and control groups were primigravida and were not having history of previous infant feeding pattern. These findings were emphasized by ***Nishimura et al., (2018),*** in the study entitled "Determinants of exclusive breast-feeding in rural South India" where it was stated that the majority of mothers were primigravida. From the researcher's point of view, these findings may have been because of lack of mothers' experience about proper breast-feeding pattern.

As regards current infant feeding pattern **(table 4),** the current study stated that most of the mothers in study group were feed their infants exclusive breast-feeding as compared with most of the mothers in control group were feed their infants non-exclusive breast-feeding, half of the mothers in study group were initiated breast-feeding within1:24 hrs after delivery and more than one third of the mothers in control group were initiated breast-feeding within1:24 hrs after delivery. It was contradicted with ***Setorglo et al., (2020),*** in a similar study entitled "Timely initiation and exclusive breast-feeding rates at Adentan Municipality in Ghana" which stated that the majority of mothers initiated BF within the first hour after birth and more than half of mothers exclusively breastfed their infants for 6 months. From the researcher's point of view, this may be due to maternal exhaustion after delivery.

The present study revealed that the great majority of the infants in study group were received colostrum feeding, while less than three quarters of the infants in control group were received colostrum feeding.

The present study **(table 5)** showed that there was statistically significant difference between the studied mothers' knowledge pre- and post-nursing intervention. It was noticed that more than half of the mothers in study group had unsatisfactory knowledge regarding EBF in pre-nursing intervention. On the other hand, it was observed that most of them had satisfactory knowledge regarding EBF in post-nursing intervention. These findings were in accordance with the study of***Pokhrel et al., (2018)***, which revealed that 45% of the studied mothers had good level of knowledge. The findings of the current study also came in

line with the study of ***Nababan et al., (2019),***in Kobakma which was entitled "Health promotion media to behavior change on exclusive breast-feeding mothers" and revealed that the increasing of mean value on knowledge from the intervention group after the counseling program is as many as 10.8, p-value 0,000.

Concerning the studied mothers' reported practice about preparation of breast-feeding, the current study **(Table 6)** clarified that there was statistical significance difference between the studied mothers' reported practice regarding preparation of breast-feeding in pre- and post-nursing intervention where the studied mothers' had competent preparation of breast-feeding reported practice post-nursing intervention (P-value=0.001**).

Concerning the studied mothers' reported practice about breast-feeding (latching on), the current study **(Table 7)** clarified that there was highly statistical significance difference between the studied mothers' reported practice regarding breast-feeding (latching on) in pre- and post-nursing intervention where the studied mothers' had competent latching on reported practice post-nursing intervention (P-value=0.003**).

Concerning the studied mothers' reported practice during breast-feeding, the current study **(Table 8)** clarified that there was highly statistical significance difference between the studied mothers' reported practice during breast-feeding in pre- and post-nursing intervention where the studied mothers' had competent reported practice during breast-feeing post-nursing intervention (P-value=0.000**).

Concerning the studied mothers' reported practice after breast-feeding, the current study **(Table 9)** clarified that there was highly statistical significance difference between the studied mothers' reported practice after breast-feeding, in pre- and post-nursing intervention where the studied mothers' had competent reported practice after breast-feeing post-nursing intervention (P-value=0.000**). This study result is supported by **Valdes et al., (2016)** study which entitled "The impact of a hospital and clinic-based breast-feeding promotion programme in a middle class urban environment" who reported that hospital interventions in support of breast-feeding have been highly successful impact on breast-feeding practices especially during and after breast-feeding. From the researcher point of view, breast-feeding has determined steps and mothers should follow these steps orderly to promote EBF.

The present study **(table 10)** showed that there was statistically significant difference between the studied mothers' reported practice pre- and post-nursing intervention. It was noticed that more than three quarters of the mothers in study group were incompetent regarding EBF in pre-nursing intervention. On the other hand, it was observed that most of them were competent regarding EBF in post-nursing intervention. These results were in agreement with a study carried by ***Ngongalah et al., (2018),***in Cameroon entitled "Infant feeding perceptions and barriers to exclusive breast-feeding in urban and rural Cameroon" which stated that there was a limited understanding of the correct practice of EBF. From the researcher's point of view, this may have been due to lack of experience of the studied mothers regarding EBF.

The findings of the current study **(figure 1)** regarding total score level of infants' developmental pattern of study and control groups, it was found that there was statistically significant difference between the infants in both study and control groups regarding their total developmental pattern. It was noticed that the great majority of the infants in study group had high development. On the other hand, it was observed that about three quarters of the infants in control group had moderate development.

The findings of the present study **(figure 2)** indicated that there was highly statistically significant difference between the infants in both study group and control group regarding total health status.

The findings of the present study **(table 11)** clarified that there was no statistically significant difference between total level of studied mothers' knowledge about EBF and their characteristics at p> 0.05. These findings were supported by the study of ***Karimi et al., (2019),***in Iran, entitled "Factors affecting exclusive breast-feeding: theory of planned behavior" which showed that no statistically significant relationship between EBF behavior and mother's age, mother's educational level, and mother's job (p>0.05).

The findings of the present study **(table 12)**illustrated that there was statistically significant positive correlation (r=0.985, P<0.004) between pre- and post-nursing intervention of total mothers' knowledge and reported practice regarding EBF.

The findings of the present study **(table 13)** indicated that there was high statistically significant positive correlation(r=0.916, P<0.000) between study and control groups of total health status of infants. It was emphasized by***Fitri and Shofiya (2020),*** in a study in West Surabaya, entitled "Correlation between exclusive breast-feeding and the frequency of illness among infants in west Surabaya" who clarified that there was significant correlation between EBF and frequencies of illness among infant in west Surabaya.

The findings of the current study **(table 14)** illustrated that there was positive correlation (r=0.553, p<0.002) between total mothers' knowledge and reported practice, total infants' growth and developmental patterns and total health status of infants.

CONCLUSION

The current study concluded that, nursing intervention for the studied mothers about exclusive breast-feeding had a positive effect on health status of their infants where there was highly significant positive correlation between both study and control groups of total health status of infants and there was statistically significant positive correlation between pre- and post-nursing intervention of total mothers' knowledge and reported practice regarding exclusive breast-feeding as well as there was positive correlation between total mothers' knowledge and reported practice, total infants' growth and developmental patterns and total health status of infants.

Recommendations:

In the light of the study findings, the following recommendations are suggested:

- Periodical health education and awareness programsabout the importance of EBF should be directed for young and primipara mothers.
- Developing pre and post-natal nursing intervention for promoting and supporting EBF should be directed for young and primipara mothers.
- Antenatal counseling, family support, and mother support group should be emphasized as the preparation of mothers for EBF.
- Regular monitoring of health status of breast-feeds infants to assess effect of EBF.
- Monitoring maternal- infant hindering factors of EBF.
- Emphasize the importance of pediatric nurse' role in promoting and supporting EBF.
- Further researchers are required involving larger study sample of mothers and their infants at different study settings all over Egypt.

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