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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.* ***Setting:*** *This study was conducted at selected Maternal and Child Health Centers in Maasara, Ain Helwan, Hadayek Helwan and El Sait Khadra.* ***Design:*** *A quasi experimental research design was utilized.* ***Sample:*** *A purposive sample of 60 mothers and their accompanying infants were attending the previously mentioned settings for BCG immunization during the first week of life.* ***Tools:*** *Two tools were used in this study, the first tool was a structured interviewing questionnaire sheet (was used pre/post nursing intervention) to assess mothers' knowledge and practice regarding exclusive breast-feeding, the second tool was health status assessment and follow-up recorded 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=0.032, P<0.032) between control group and study group of total infants' growth and development patterns and there was highly significant positive correlation (r=0.916, P<0.000) between control group and study group of total health status of infants.* ***Conclusion:*** *There was highly significant positive correlation (r=0.916, P<0.000) between control group and study group of total health status of infants so nursing intervention for mothers about exclusive breast-feeding were have a positive effect on health status of infants.* ***Recommendations:*** *Periodical health education and awareness programs about the importance of exclusive breastfeeding should be directed for young and first-time mothers.*
Key words: *Breast-feeding, Exclusive, Health Status, Infants, Intervention, Mothers, Nursing.*

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I. 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 ***(Tagher and 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, breastfeeding 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 ***(Tagher and 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 very early infancy. Among infants under two months of age, 71% receiving only breast milk. However, the proportion exclusively breastfed drops off rapidly among older 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 risks of diarrhea and pneumonia related infant morbidity 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 to assess the effect of nursing interventions for mothers about exclusive breast-feeding on health status of their infants through the following:

1- Assess the studied mothers' level of knowledge and practice regarding exclusive breast-feeding.

2- Develop and implement nursing intervention program for the studied mothers regarding exclusive breast-feeding.

3- Evaluate 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.

II. 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 Maasara Family Health Center, Ain Helwan Family Health Center, Hadayek Helwan Family Health Center and El Sait Khadra 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 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 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 were implemented only to infants in study group.
The researcher compared between control and study group regarding physical, physiological growth, development pattern, and health status and also, the researcher compared between total level of the studied mothers' knowledge and practice regarding EBF before and after nursing interventions.

Tools of Data Collection: (Appendix II)
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 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 practice of study and control groups regarding exclusive breast-feeding: (was used pre/post nursing intervention) such as definition of exclusive breast-feeding, breast care before breast feeding, duration of exclusive breast-feeding, benefits of exclusive breast-feeding for infant, mother, family, and society, causes of early discontinuation of exclusive breast-feeding, mothers beliefs regarding breast-feeding, mothers beliefs regarding benefits of artificial milk, contraindications for exclusive breast-feeding, and proper breast-feeding practices.
Questions were in the form of open and closed ended and multiple choices questions. The time consumed to fill in the questionnaire by the researcher for each mother (study and control groups) included in the study was 15-30 minutes.

Scoring system
According to study subjects answer. Some questions had correct and incorrect answer, the correct response was scored 1 and incorrect was scored zero for each area of knowledge. While, some questions had complete correct answer, incomplete correct answer and do not know. The complete correct answer was scored 2, incomplete correct answer was scored 1 and do not know was scored zero. The scores of the items were summed-up and total divided by number of the items, giving a mean score for the items. Regarding the knowledge of the studied mothers, 100 scores were allocated to all items of the questionnaire. Then the answers were checked with a model key answer. Scoring was converted from degree to percentage and accordingly the studied sample knowledge was categorized into two levels: unsatisfactory (<60%) and satisfactory (≥60%).

Part III:
Infant 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 Recorded Sheet: (was used pre/post and follow-up nursing intervention for study and control groups)
Health Status Assessment and Follow-up Recorded Sheet that was designed by the researcher after reviewing the current available literature such as; **(Abdullah et al., 2016)** and composed the following parts:

Part I: Infant Growth Chart
Infant physical measurements were included infant weight, length, head and chest circumference that were measured and recorded using growth chart.
Part II: Infant physiological measurements were included temperature, pulse, and respiration.
Part III: Development of infant was included dentition, motor, cognitive, social, and emotional development.
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 development, 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 Recorded 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, skin and 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.

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 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 in the questionnaire. 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 the Maasara Family Health Center, Ain Helwan Family Health Center, Hadayek Helwan Family Health Center and El Sait Khadra Family Health Center.
The actual field work was carried out in the first of September (2019) up to the end of February (2020) for data collection and program implementation. Filling in the questionnaire sheets was conducted at the waiting area of the previously mentioned 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 and their accompanying infants. 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 questionnaire and health status assessment & follow-up recorded sheet 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, it 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.

Suitable teaching aids prepared specially for the program were a booklet, colored posters, and brochure.

Children were encouraged to participate through continuous motivation and reinforcement.

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.

Theoretical part:

It was conducted through lectures and group discussions, using power point presentation, booklet, and brochure. At the beginning of the first session, an orientation to the program and its purpose took place, each session stared with a summery for the previous session; simple words and Arabic language were used to suit the mothers' level of understanding. The studied mothers were informed about the time and place of the sessions. It started by clarifying the purpose of the nursing intervention program, number of sessions, learning methods, tools, and evaluation methods and at the end of each session, the mothers' questions were discussed and answered.

Each session started by the summary about what was given in the previous session to ensure that they remembered the instructions given and to reinforce the knowledge. The objectives of the new topics were mentioned through; using simple, brief, and clear language with scientific terms to suit the level of the studied mothers; at the end of each session, the researcher summarized the bulk of information with the studied mothers and emphasized the most important points. The handout was distributed to all the studied mothers included in the program on the first day of starting the program implementation. Each group received the same program content by using the same teaching strategies as (lecture, role play, small group discussion, demonstration, and re-demonstration).

Session (1): It was acquaintance session for greeting and identification of each other and identify the purpose and schedule of the program.

Session (2): the contents of this session were; introduction to identify breast feeding and exclusive breast feeding, physiology of breastfeeding.

Session (3): Summary about what had been discussed in the previous session, the objectives of the new session were: identify components of breast milk, determine duration of exclusive breast-feeding, and explain the benefits of exclusive breast-feeding for infant, mother, family, and society.

Session (4): Summary about what had been discussed in the previous session, the objectives of the new session were: clarify challenges of exclusive breast-feeding and discuss factors affecting early discontinuation of exclusive breast-feeding.

Session (5): Summary about what had been discussed in the previous session, the objectives of the new session were: list contraindications for breast-feeding and clarify the proper breast-feeding positions.

Session (6): Summary about what had been discussed in the previous session, the objectives of the new session was: illustrate storage of expressed breast milk.

Practical part:

It was conducted through demonstration and re-demonstration. It was taken in 2 sessions. each session was 45 minutes.

Session (1): Summary about what had been discussed in the previous session, the objectives of the new session was: demonstrate the proper breast-feeding positions.
Session (2): Summary about what had been discussed in the previous session, the objectives of the new session was: demonstrate the proper breast-feeding practices and demonstrate the technique of storage of expressed breast milk.
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.

IV. 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

The ethical research considerations in this study were included the following: -

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 25 as 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 mean ± 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.

III. Results:

Table (1): Number and percentage distribution of 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
$\bar{x}$ ± 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 and figures revealed that; more than half (60% and 56%) of the studied and controlled mothers were in the age group of 20: < 30 years, with $\bar{x}$ ± 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, about two thirds (80% and 63%) of them were housewife respectively and half (50% and 60%) of them were satisfied with family income respectively.

Table (2): Number and percentage 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
No	12	**40.0**	14	**46.7**

Table (2) regarding history of previous infant feeding pattern, this table illustrated that more than one third (40% and 46.7%) of the studied and controlled mothers, this infant was the first infant and were not having history of previous infant feeding pattern respectively.

Table (3): Number and percentage distribution of mothers according to current infant feeding pattern (n= 60)

Items	Study group n=30		Control group n=30	
	No	%	No	%
Current infant feeding pattern				
Exclusive breastfeeding	26	**86.6**	0	0.0
Non-exclusive breastfeeding	4	13.4	26	**86.6**
Formula feeding	0	0.0	4	13.4
Time of initiation of breastfeeding				
Immediately after delivery	11	36.7	5	16.7
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
Colostrum feeding				
Yes	29	**96.7**	21	**70.0**
No	1	3.3	9	30.0
Frequency of breastfeeding				
On demand	29	**96.7**	27	**90.0**
On o'clock	1	3.3	3	10.0
Duration of breastfeeding at a time / minutes				
Less than 5	1	3.3	0	0.0
5:10	25	**83.3**	25	**83.3**
10:20	3	10.0	5	16.7

20:30	1	3.3	0	0.0
Pattern of breastfeeding				
One side at a time	14	46.7	14	**46.7**
Both sides at a time	16	**53.3**	13	43.3
Artificial milk	0	0.0	3	10.0
Which breast usually you start breastfeeding?				
Any side	14	**46.7**	13	**43.3**
Right side	10	33.3	12	40.0
The side that ended the feeding the previous time	1	3.3	3	10.0
Do not remember	5	16.7	2	6.7

Table (3) regarding current infant feeding pattern, it was stated that 86.6% of the studied mothers were feed their infants exclusive breastfeeding, while 86.6% of the controlled mothers were feed their infants non-exclusive breastfeeding. 50% of the studied mothers were initiated breastfeeding within1:24 hrs after delivery and 46.6% of the controlled mothers were initiated breastfeeding within1:24 hrs after delivery. 96.7% of the studied infants were received colostrum feeding, while 86.7% of the controlled infants were received colostrum feeding. 96.7% of the studied infants were received breastfeeding on demand and 90% of the controlled infants were received feeding on demand, 83.3% and 83.3% of the studied and controlled mothers were feed their infants for 5:10 minutes in a time respectively. More than half (53.3%) of the studied mothers were feed their infants from both sides in a time and more than one third (46.7%) of them start feeding their infants from any side of breast while about half (46.7%) of the controlled mothers were feed their infants from one side in a time and more than one third (43.3%) of them start feeding their infants from any side of breast.

Table (4): Number and percentage distribution of the studied mothers' practice about successful breastfeeding (pre/post nursing intervention)

Steps of successful breastfeeding		Pre- intervention		Post- intervention		X^2	P-value
		No	%	No	%		
1- Hand washing	**Done**	3	10.0	25	**83.3**	1.159	0.282
	Not done	27	**90.0**	5	16.7		
2- 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		
3- Carry the infant and make the mother's skin touch her infant's skin until his mother's body is tucked into his stomach and his head is close to her nipples.	**Done**	23	**76.7**	25	**83.3**	10.770	**0.001**
	Not done	7	23.3	5	16.7		
4- Support the back of the infant with your arm and hands. The support of his shoulders and lower part will enable him to move his head slightly back to the breast.	**Done**	12	40.0	27	**90.0**	2.222	0.136
	Not done	18	**60.0**	3	10.0		
5- The infant will find your nipple and may touch it with his hand first.	**Done**	18	**60.0**	25	**83.3**	1.000	0.317
	Not done	12	40.0	5	16.7		
6- After a few attempts, the infant will push his chin toward his breast, and then he will swallow the breast.	**Done**	27	**90.0**	27	**90.0**	11.893	0.001
	Not done	3	10.0	3	10.0		
7- After the infant has mastered the breast, you can adjust your position until you are in a comfortable position.	**Done**	5	16.7	24	**80.0**	1.500	0.221
	Not done	25	**83.3**	6	20.0		

(*) Statistically significant difference at p<0.05.

Table (4) clarified that there was statistical significance difference between the studied mothers' practice regarding carrying the infant and make the mother's skin touch her infant's skin until his mother's body

is tucked into his stomach and his head is close to her nipples in pre- and post-nursing intervention implementation.

Table (5): Number and percentage distribution of total score level of mothers' knowledge regarding exclusive breastfeeding (pre/post nursing intervention)

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 implementation. It was noticed that more than half (60%) of the studied mothers had unsatisfactory knowledge regarding exclusive breast-feeding in pre-nursing intervention. On the other hand, it was observed that most (86.7%) of them had satisfactory knowledge regarding exclusive breast-feeding in post-nursing intervention implementation.

Table (6): Number and percentage 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
$\bar{x}$ ± 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 (6) and regarding infants' characteristics, it was indicated that 76.6% and 56.7% of the studied and controlled infants were having 3: < 5 days with $\bar{x}$ ± SD 4.13 ± 1.358, 4.50 ± 1.717 days respectively, about two thirds (63.3%) of the studied infants were male while more than two thirds (66.7%) of the controlled infants were female, more than one third (40% and 46.6%) of the studied and controlled infants were the first son respectively, more than half (63.3% and 73.3%) of the studied and controlled infants were delivered by cesarean section respectively, more than one third (43.3%) of the studied infants were delivered in governmental hospitals while more than one third (36.7%) of the controlled infants were delivered in private clinic and most (96.7% and 96.7%) of the studied and controlled infants were born without complications respectively.

Figure (1):- Number and percentage distribution of total score level of infants' development pattern

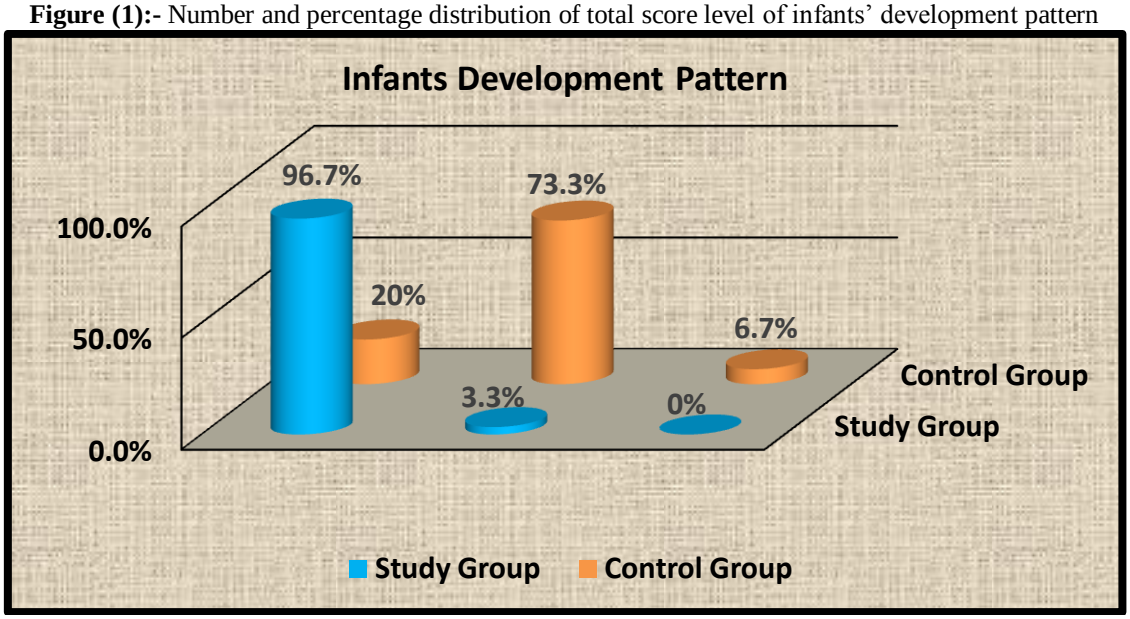

Figure (1) revealed that there was statistically significant difference between the studied and controlled infants regarding their total development. It was noticed that the great majority (96.7%) of the studied infants had high development. On the other hand, it was observed that about three quarters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

Figure (2):- Number and percentage distribution of total score level of infants' health status in both study and control groups

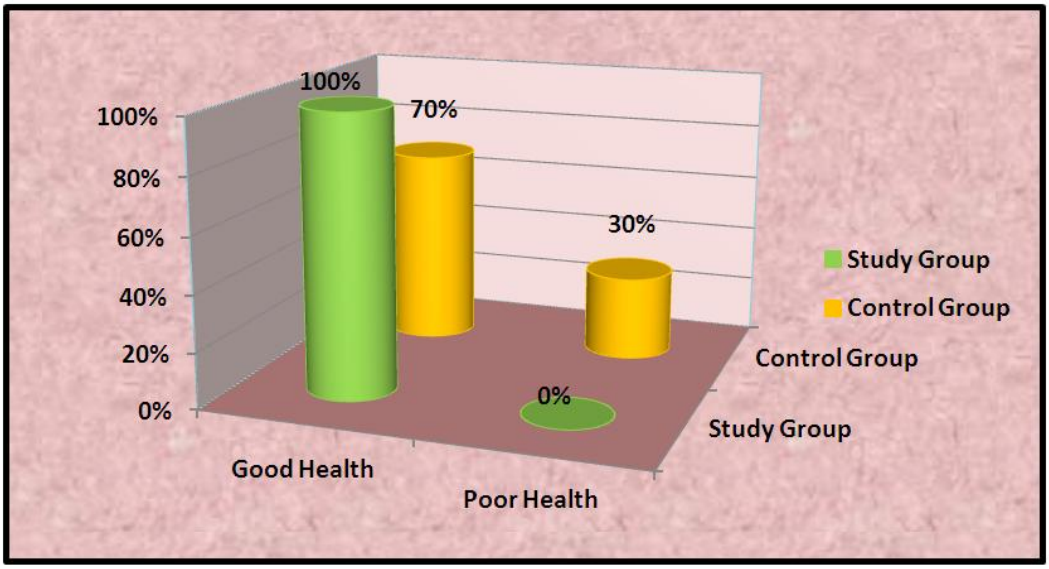

Figure (2) indicated that there was highly statistically significant difference between study group and control group regarding total health status of infants.

Table (7):- Relation between total level of studied mothers' knowledge about exclusive breastfeeding and their characteristics

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 (7) clarified that there was no statistically significant difference between total level of studied mothers' knowledge about exclusive breast feeding and their characteristics at p> 0.05.

Table (8):- Correlation between total mothers' knowledge and practice, total infants growth and development patterns and total health status of infants

Post test		Total mothers' knowledge and practice	Total infant' growth and development patterns	Total health status of infants
Total mothers' knowledge and practice	**r test**	**_**	**0.553**	**0.754**
	P - value	**_**	**0.002***	**0.060**
Total infants' growth and development 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 (8) illustrated that there was positive correlation (r 0.553, p=0.002) between total mothers' knowledge and practice, total infant growth and development patterns and total health status of infants.

IV. DISCUSSION

Regarding the mothers' characteristics, the findings of the current study **(table 1)** revealed that more than half (60% and 56%) of the studied and controlled mothers were in the age group of 20:< 30 years respectively, These findings were similar to some extent to those of the study of ***Bhanderi et al., (2019),*** in India, entitled "Barriers to exclusive breastfeeding in rural community of central Gujarat, India" which revealed that the mean age of the studied mothers was 24.6 years ± 3.5.

As regards mothers' educational level, the findings of the current study illustrated that more than half (53.3% and 50%) of the studied and controlled mothers were secondary school respectively. These findings came in line with the study of ***Ndikom et al., (2020),*** in Nigeria which was entitled "Breastfeeding education

and exclusive breastfeeding practices among mothers in Ibadan, Oyo State, Nigeria" and revealed that 64.7% of the studied mothers were secondary school. However, these contradicted with the findings of the study of ***Dwinanda et al., (2018),*** in Jakarta, Indonesia, entitled "Factors affecting exclusive breastfeeding in term infants" which stated that more than two thirds of the studied mothers were high educational level. From the researcher's point of view, these findings may have been due to differences in cultures, beliefs and educational levels of parents.

Regarding mothers' residence, the findings of the current study clarified that more than half (60% and 73.3%) of the studied and controlled mothers were from urban residence respectively. 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 52.2% of the studied sample were from rural areas. From the researchers' 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 (90% and 96.7%) of the studied and controlled mothers were married respectively. These findings were supported by the study of ***Ndikom et al., (2020),*** entitled "Breastfeeding education and exclusive breastfeeding practices among mothers in Ibadan, Oyo State, Nigeria" which revealed that 92% of the studied mothers were married.

Regarding mothers' occupation, the findings of the current study stated that, about two thirds (80% and 63%) of the studied and controlled mothers were housewife respectively and half (50% and 60%) of them 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 breastfeeding 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 breastfeeding among working mothers in Indonesia" and revealed that most women in Indonesia did not work. From the researchers' point of view, these findings may have been due to the lower educational level of non-working mothers.

Regarding history of previous infant feeding pattern, the findings of the current study **(table 2)** showed that more than one third (40% and 46.7%) of the studied and controlled mothers, this infant was the first infant and were not having history of previous infant feeding pattern respectively. These findings were emphasized by ***Nishimura et al., (2018),*** in the study entitled "Determinants of exclusive breastfeeding in rural South India" where it was stated that the majority of the mothers were primigravida. From the researchers' point of view, these findings may have been because of lack of mothers' experience about proper breastfeeding pattern.

As regards current infant feeding pattern **(table 3),** the current study stated that most of the studied mothers were feed their infants exclusive breastfeeding, while most of the controlled mothers were feed their infants non-exclusive breastfeeding, half of the studied mothers were initiated breastfeeding within1:24 hrs after delivery and more than one third of the controlled mothers were initiated breastfeeding within1:24 hrs after delivery. It was contradicted with ***Setorglo et al., (2020),*** in a similar study entitled "Timely initiation and exclusive breastfeeding 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 researchers' point of view, this may be due to maternal exhaustion after delivery.

The present study revealed that the great majority of the studied infants were received colostrum feeding, while more than three quarters of the controlled infants were received colostrum feeding. The great majority of the studied infants were received breastfeeding on demand and the great majority of the controlled infants were received feeding on demand. The findings of the current study came in line with the study of ***Ayuk et al., (2018),*** in Sub-Saharan Africa which was entitled "The determinants of exclusive breastfeeding in Cameroon, Sub-Saharan Africa" and revealed that the majority of infants of surveyed had consumed colostrum within the early days of life. Although this contradicts with the findings of the study of ***Islam et al., (2017),*** entitled "Constraints of exclusive breastfeeding practice among breastfeeding mothers of Dhaka Slums" which stated that 67.2 % of the studied mothers feed their infants less than 6 to 8 times/day. From the researchers' point of view, these differences may be due to cultural differences.

Regarding duration of infants feeding, the findings of the current study showed that more than three quarters of the studied and controlled mothers were feed their infants for 5:10 minutes in a time. More than half of the studied mothers were feed their infants from both sides in a time and more than one third of them start feeding their infants from any side of breast while about half of the controlled mothers were feed their infants from one side in a time and more than one third of them start feeding their infants from any side of breast.

Concerning the studied mothers' practice about successful breastfeeding, the current study **(Table 4)** clarified that there was statistical significance difference between the studied mothers' practice regarding carrying the infant and make the mother's skin touch her infant's skin until his mother's body is tucked into his stomach and his head is close to her nipples in pre- and post-nursing intervention implementation.

These results were in agreement with a study carried by ***Ngongalah et al., (2018),*** entitled "Infant feeding perceptions and barriers to exclusive breastfeeding in Urban and Rural Cameroon" which stated that

there was a limited understanding of the correct practice of exclusive breastfeeding. From the researcher's point of view, this may have been due to lack of experience of the studied mothers regarding exclusive breastfeeding.

The present study **(table 5)** showed that there was statistically significant difference between the studied mothers' knowledge pre- and post-nursing intervention implementation. It was noticed that more than half of the studied mothers had unsatisfactory knowledge regarding exclusive breast-feeding in pre-nursing intervention. On the other hand, it was observed that most of them had satisfactory knowledge regarding exclusive breast-feeding in post-nursing intervention implementation.

These findings were in accordance with the study of ***Pokhrel et al., (2018)***, entitled "Factors associated with exclusive breastfeeding practices in western Bhutan" which revealed that 45% of the studied mothers were have 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 breastfeeding 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 poin, p value 0,000.

Regarding infants' characteristics, the current study **(table 6)** indicated that 76.6% and 56.7% of the studied and controlled infants were having 3:<5 days respectively, about two thirds of the studied infants were male while more than two thirds of the controlled infants were female, more than one third of the studied and controlled infants were the first son respectively, more than half of the studied and controlled infants were delivered by cesarean section, more than one third of the studied infants were delivered in governmental hospitals while more than one third of the controlled infants were delivered in private clinic and most of the studied and controlled infants were born without complications.

These findings were emphasized by ***Alzaheb (2017)***, in the study entitled "Factors influencing exclusive breastfeeding 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, entitled "Factors associated with exclusive breastfeeding practices in western Bhutan" which stated that 77.7 % of the studied infants were delivered normal and 98.2% were delivered in medical centers. Although this contradicts with the findings of the study of ***Nishimura et al., (2018),*** entitled "Determinants of exclusive breastfeeding in rural South India" 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 point of view, this might be due to prevailing cultural beliefs and social standards in oriental communities, which have a bias toward males.

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 studied and controlled infants regarding their total development. It was noticed that almost of the studied infants had high development. On the other hand, it was observed that about three quarters of the controlled infants had moderate development.

The findings of the present study **(table 7)** clarified that there was no statistically significant difference between total level of mothers' knowledge about exclusive breast feeding 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 breastfeeding: theory of planned behavior" which showed that no statistically significant relationship between EBF behavior and mother's age, mother's education level, and mother's job (p>0.05).

The findings of the present study **(figure 2)** indicated that there was there was highly statistically significant difference between study group and control group regarding total health status of infants. From the researchers' point of view, these may be due to effect of exclusive breastfeeding.

The findings of the current study **(table 8)** illustrated that there was positive correlation (r 0.553, p=0.002) between total mothers' knowledge and practice, total infant growth and development patterns and total health status of infants.

V. CONCLUSION

The current study concluded that, there was highly significant positive correlation (r=0.032, P<0.032) between control group and study group of total infants' growth and development patterns and there was highly significant positive correlation (r=0.916, P<0.000) between control group and study group of total health status of infants as well as there was positive correlation (r 0.553, p=0.002) between total mothers' knowledge and practice, total infant growth and development patterns and total health status of infants.

VI. RECOMMENDATIONS:

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

- Periodical health education and awareness programs about the importance of exclusive breastfeeding should be directed for young and first-time mothers.

- Counseling services and support for mothers of preterm infants to ensure the early establishment of frequent milk expression.
- Emphasize the role of pediatric nurse in promoting and supporting exclusive breastfeeding.

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