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Effect of Educational Training Program on Mothers Knowledge and Practice and Clinical Outcomes for Infants with Congenital Nasolacrimal Duct Obstruction

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Abstract: **Background: Congenital obstruction of the nasolacrimal duct is a common occurrence in young children. The study aimed was to evaluate the effect of educational training program on mothers' knowledge and practice and clinical outcomes for infants with congenital nasolacrimal duct obstruction. Subjects and method: A quasi-experimental research design was used. The study was conducted at out-patient clinic at Ophthalmology Department of Main Tanta University Hospital and out-patient clinic of Ophthalmology Hospital of Tanta City which Affiliated to Ministry of Health and Population. Convenience sampling of 40 mothers and their infants from each of the previous mention sitting. Data was collected using three tools: mothers' knowledge and socio - demographic characteristics, mothers' practices observational check list and clinical outcomes for infants. The results revealed that the majority of mothers had poor knowledge scores preprogram intervention and improved immediately and after one month program and less than one quarter of them had satisfactory practice (pre) compared to majority of them immediate and after one month had satisfactory practices. High improvement of infant's clinical outcomes reached majority of them after one month cured and didn't need surgical treatment. The study was concluded: A significant difference between total mothers knowledge and practice before, immediate and after one month program introduction, and high rates improvement of infants' clinical outcomes. Recommendation Nasolacrimal massage should be used by all children with nasolacrimal duct obstruction, and in-service educational training sessions should be held on a regular basis.**

Keywords: **Educational Training Program, Mothers' Knowledge and Practice, Clinical Outcomes for infants, Nasolacrimal Massage, Congenital nasolacrimal duct obstruction.**

1. INTRODUCTION

Epiphora is a common clinical ophthalmology condition that is caused by a congenital abnormality of the lacrimal drainage system. It is caused usually by the result of a congenital abnormality of the lacrimal drainage system. In majority of the cases; it is due to a membranous obstruction at the lower end of the nasolacrimal duct. Congenital nasolacrimal duct obstruction is a common disease that affects 20% of infants' worldwide in their first year of life and is caused by failure of canalization of nasolacrimal duct. Canalization of the nasolacrimal duct usually takes place at the end of first six months of life within the womb. It can however, take several weeks or months after birth. (1)

Variety of management are available, ranging from conservative methods like lacrimal sac massage with or without antibiotic eye drops, to more intrusive methods such as probing, balloon catheterization, silicon tube intubation, and dacryocystorhinostomy. The most common treatment for are typically treated with non-surgical management (sac massage) which has been reported to have a high success rate. It is advisable in children less than one year old to "wait and see" while applying conservative management. [2]

Congenital nasolacrimal duct obstruction causes a wide range of symptoms to the infant who can be upsetting for the mothers. It may also cause to frequent tearing which can lead to infections including dacryocystitis, orbital cellulitis, and bacterial conjunctivitis. According to recent research suggest that infants with congenital nosocomial duct are more likely than the general population to develop amblyopia**.** Surgical procedures can be dangerous especially during the first year of life, so educational program to mothers is recommended as a guide to assist mothers and can be followed at home to help the tear duct open. [3, 4]

Primary management of uncomplicated Nasolacrimal Duct Obstruction is a regimen of nasolacrimal sac massage, typically 2 to 3 times per day, followed by a washing of the lids with warm water and topical antibiotics; this result in high rates of resolution and will cure the infection in 76 percent to 89 percent of the cases. It was protect the newborn from complications such as harmful anesthesia, nasal bleeding, duct restenosis, and duct development of a false passage following nasolacrimal duct surgery. [5, 6]

Ophthalmic nurses assist in the assessment, diagnosis and treatment of patients with various eye diseases and injuries. They often assist with eye exams, record symptoms and perform vision tests. The nurse has an integral roles include health education for mothers about guidelines of treatment as benefits, frequency and proper technique of nasolacrimal sac massage and antibiotic eye drops. Also education about benefits, frequency and proper technique of eye care will lead to high rates of improvement to save the infant from complications. [7, 8]

Significance of the study:

Congenital nasolacrimal duct obstruction is a significant public health problem. It also has significant medical, physiological, social, and financial consequences for the child and family. Congenital Nasolacrimal Duct Obstruction is a common ocular disease in infants; it affects up to 70% of newborns globally, but only 6% of these children develop symptoms. There is no predisposition based on gender, race, or genetics. 14-33.8 percent of children with congenital nasolacrimal duct obstruction have bilateral symptoms. By the age of one, the recorded incidence of nasolacrimal duct obstruction resolution without surgery ranges from 32% to 95%. [9, 10, 11]

2. AIM OF THE STUDY

The study was conducted to evaluate the effect of educational training program on mothers' knowledge and practice and clinical outcomes for infants with congenital nasolacrimal duct obstruction.

3. SUBJECTS AND METHOD

Research Design:

Quasi-experimental research design was used. The study was conducted at Out-patient clinic at Ophthalmology department of Main Tanta University Hospital and Out-patient clinic at Ophthalmology Hospital of Tanta City which Affiliated to Ministry of Health and Population.

3.1. Subjects

Sample: A convenience sampling of eighty mothers and their infants that diagnosed with congenital nasolacrimal duct obstructions who were attended the previously mention setting. The sample size was based on the following parameters confidence level error level 5% type I error 0.05 and power of test 90%. Infant having the following criteria; both sexes and no nasolacrimal obstruction surgery will be performed.

3.2. Three Tools Were Used to Collect Data

Tool (I): Mothers' knowledge and socio -demographic characteristics.

Structured interview schedule was developed by the researcher after reviewing the related literature: It consisted of three parts:

Part (1): Socio -demographic characteristic of mothers as: age, level of education, occupation, period of pregnancy and residence.

Part2: Infants characteristic such as: age, birth order, sex, weight of infant, laterality of the obstruction, Age of the infant at the appearance of symptoms and symptoms appear on the infant. **Part three:** Mothers' knowledge: It was created by the researcher in order to evaluate mothers' knowledge related to their infants with congenital nasolacrimal duct obstruction including definitions, definition, causes, signs and symptoms, treatment, complication, importance of care of the eye in the prognosis of the obstruction and frequency of nasolacrimal massage.

Scoring System for mother' knowledge:

Mothers' knowledge was scored as following: - Correct and complete answer was scored (two), Correct and incomplete answer was scored (one), and don't know or incorrect answer was scored (zero). More than 60% were considered good knowledge. From 60% to 5o% was considered fair and less than 50% were considered poor.

Tool (II): **Mothers' practices by using Observational check list**: it was created by the researcher after reviewing related literature [(12)] and consists of five steps that represent massage technique, such as: cutting the nails, washing hands, using lubricant, place the index finger, the number of times to perform that technique and care of their infants such as: care of infant in home in case of nasolacrimal duct obstruction, benefits and correct area of nasolacrimal duct massage, steps for eye care and how to make eye compression, dangerous signs when appear should report doctor and how to care infant when temperature increased.

Scoring System for mother's practices:

Mother' practices were scored as follows: Done correctly and complete was scored (two), done correctly but incompletely was scored (one) and not done was scored (zero).

Total score of mothers' practice was calculated as follows:

Satisfactory 60% andmore and unsatisfactory less than 60% of the total score.

Tool (III): Clinical outcomes for infants: it was developed by the researcher after reviewing the related literature [(13, 14)] to determine the effects of educational training program for mothers on their knowledge and practice related to their infants with congenital nasolacrimal duct obstruction

- Symptoms worse or not improved or slightly improved or improved such as (epiphora, eyelid swollen, eyeball redness, inflammation of eyelid and discharge of eye).

3.3. Method

This study was accepted by Research Ethical Committee of Faculty of Nursing, Tanta University at (20-2-2019. **Informed consent** was obtained from the study subjects after offering adequate explanation about purpose of the study and their right to with draw at any time without providing a reason. **Ethical and legal consideration**: Confidentiality and privacy was maintained and nature of the study was not cause harm or pain. The tools were presented to a jury of five pediatric nursing experts to check content validity, consistency, significance, comprehensiveness, applicability, and ease of implementation. Content validity index was (99.1%). To assess **reliability,** of the developed tools used was tested through the internal consistency. The value of Alpha cronbach's coefficient was 0.949. **A Pilot study** was carried out by the researcher for testing the clarity and feasibility of both tool (I and II). It was conducted on sample of 10% of the studied subjects (8) mothers and their infants to test the tools for its reliability, applicability and feasibility and the required modification was made. The mothers and their infants of pilot study sample were excluded from the study sample.

3.4. Implementation of the Study: The study was conducted through four phases:

1-Assessment phase: It was done by the researcher for all study subjects to assess the studied mothers and their infants who met the inclusion and exclusion criteria of this study. Firstly, met doctors and nurses to clarify the purpose and the educational training program of the study to gain their cooperation after taking permission from related authorities. Subjects who meet the inclusion criteria of the studied sample were interviewed by the researcher in the waiting area. The mothers were asked about their characteristics, socio-demographic of the infants, knowledge and practices for their infants with congenital nasolacrimal duct obstruction to answer the question of tool one. Afterward, the researcher explained to the mothers how to make massage technique and care for their infants (tool II). Every mother was observed by the researcher three times to assess the actual care for their infants.

2-Planning phase: based on data of assessment phase, review of literature and the researcher developed the educational training program according to mothers' education needs and expected outcomes criteria were formulated, different methods and audio visual materials for educational program were used including PowerPoint presentations, small lectures, and group discussion, poster and pictures to facilitate their learning.

3-Implementation phase:

The researcher attended at 9am till 12.00 pm three consecutive days in the previously mentioned settings to collect the data and meet the mothers their infants in the waiting area. The researcher met the study mothers, divided into ten subgroups and each group was containing eight mothers and their infants.in each group according to the availability of them. The duration of each session was 30-45 minutes. The developed educational training program was implemented by the researcher for the study subjects using introductive lecture, video, presentative posters, group discussion, demonstration and re demonstration and booklet was been demonstrated by mother. They attended the fifth sessions about:

First session: Focus on orientation of mothers about definition and importance of lacrimal duct.

Second session: Overview on nasolacrimal duct obstruction: knowledge about congenital nasolacrimal duct obstruction as definition, signs and symptoms, causes, complications and management.

Third session: Massage technique: mother's practice was improving regard infant with congenital nasolacrimal duct obstruction and enable them to perform the correct mechanism of the massage and the frequency of the nasolacrimal sac massage performance at home.

Fourth session: Ideal eye care: mothers' practice was improving regard infant with congenital nasolacrimal duct obstruction and enable them to perform the proper care for their infant at home. Mothers was educated the importance of the eye care in the prevention of infection and the subsequent complications.

Fifth session: Eye drops: mother's practice was improving regard infant with congenital nasolacrimal duct obstruction and they able to perform the correct way to give eye drops for their infant at home..

4-Evaluation phase:

-Educational training program was done immediately after finishing educational training and after one month by using (tool I, II, III) in order to assess the effect educational training program on mothers' knowledge and practice for infants with congenital nasolacrimal duct obstruction. Data were collected over a period of 6 months starting from beginning of October 2019 to April 2020.

3.5. Statistical Analysis:

The collected data were organized, tabulated and statistically analyzed using SPSS software (Statistical Package for the Social Sciences, version 21, SPSS Inc. Chicago, IL, USA). For quantitative data, the range, mean and standard deviation were calculated. For qualitative data, which describe a categorical set of data by frequency, percentage or proportion of each category, comparison between two groups and more was done using Chi-square test (χ^2). For comparison between means of two groups of parametric data of independent samples, student t-test was used. For comparison between means of two groups of non-parametric data of independent samples. Correlation between variables was evaluated using

Pearson's correlation coefficient (r). Significance was adopted at P<0.05 for interpretation of results of tests of significance. [15]

4. RESULTS

I- Socio demographic characteristics of the studied mothers; **Table (1)**: It was revealed from table that slightly less than half of the mothers (45.0%) their age 25-<30 years with mean age of 27.3 ± 4.83 and more than half (58.7%) of the mothers completed their secondary education. Regarding their occupation, more than two thirds (71.3%) of mothers were house wives. Concerning pregnancy duration more than three quarters of mothers (85.0%) have completed pregnancy period and less than two third of them (61.3%) did not taken any medication during pregnancy .Regarding type of medication intake during pregnancy, less than half of the studied mothers (41.9%) intake antiemetic drugs during first trimester and (19.3%) intake antibiotic. It was observed that slightly two thirds of them (66.2%) were from urban areas.

II- Sociodemographic data of infants; Table (2) :slightly more than one third (35.0%) of the infants aged less than 3 months and 3-5 months with a mean age of 4.06±2.74. It was clarified from table that half (50.0%) of the studied infants were in the first birth order in addition, males were presented more than half (57.5%) of the studied sample. Slightly less than three quarter (72.5%) of the studied infants was born with cesarean section and more than three quarter (78.7%) of them born with normal birth weight. Concerning symptoms appear on the infant all of them (100.0 %) have symptoms of congenital nasolacrimal duct obstruction and almost (83.7%) of the studied infants have less than or equal 6months when symptoms appear. Slightly less than three quarters (70.0%) of the studied infants have no fever with the symptoms of congenital nasolacrimal duct obstruction. It also showed from table more than three quarters (77.5%) of the studied infants had unilateral obstruction while slightly less than one quarter(22.5%)) of them had obstruction on both sides.

III- Mothers' knowledge regarding congenital nasolacrimal duct obstruction before, immediate and after one month from program implementation.

Figure (1) it was found that, total mother's knowledge about CNLDO before program was (10.0%) had good knowledge compared to (77.5%) immediate post program and (66.3%) after one month program implementation

IV- Mothers' practices regarding congenital nasolacrimal duct obstruction before, immediate and after one month from program implementation.

Figure (2): It was observed that most of the studied mothers' total practice (83.2) had unsatisfactory practice before program compared to more than three quarter (78.8) immediate post program and (77.5) after one month program implementation had satisfactory practice.

V- Infant clinical outcomes.

Table (3) highlighted that follow up program implementation revealed a highly statistically significant difference improvement of infant's signs and symptoms of congenital nasolacrimal duct obstruction immediate post program and after one month program implementation than before program. It was found that improvement eye redness from (100.0%) worse before program to (26.3%) improved immediate post program and (86.2%) after one month program implementation. Regarding epiphora there was improvement in infants' condition from (100.0%) worse before to slightly less than half (47.5%) of infants and (83.8%) improved immediate post program and after one month program implementation respectively.

Concerning eyelid inflammation there improvement in infants condition from (100.0%) worse before to more than half (55.0%) of infants and (82.5%) improved immediate post program and after one month program implementation respectively.

Figure (3) illustrate that all of the studied infants' (100.0%) had symptoms of congenital nasolacrimal duct obstruction before program compared to more than half (56.3%) and (87.5%) of them had cured immediate and after one month program implementation respectively.

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VI- Correlation between mothers' total knowledge score and practices.

Table (4) demonstrates correlation between mothers' total knowledge and total practices regarding congenital nasolacrimal duct obstruction through the program phases. It was revealed from table that there is a statistically significant positive correlation coefficient between total knowledge of the studied mothers and their total practices regarding congenital nasolacrimal duct obstruction before program, immediate post program and after one month program implementation P <0.05 .

Table (5) portrays total practice score of the studied mothers in relation to their socio demographic characteristics. It was obvious from table that mothers**.** Concerning educational level more than half (59.7%) of studied mothers had unsatisfactory practice before program were secondary education while (55.6%) and (59.7%) had satisfactory practice immediate post program and after one month program implementation respectively with statistical significant difference between studied mothers practice and their education where p<0.05.

Table (6): highlighted correlation between total practices score and studied infants clinical outcomes immediate and after one month Program Implementation, it was revealed from table that (60.3%) of the studied infants had cured of mothers had satisfactory practices compare to more than (58.8%) of the studied infants need surgery of mothers had unsatisfactory practices immediate post program while most (90.3%) of the studied infants had cured of mothers had satisfactory practices after one month program implementation.

Table (1): Percentage Distribution of the Studied Mothers Related to Socio Demographic Characteristics.

Socio demographic characteristics of studied mothers	The studied mothers n=80)	
	No	**%**
Age in years:		
<25	21	26.2
25-<30	36	45.0
30+	23	28.8
Mean ±SD	27.3 ± 4.83	
Education level:		
Read& Write	8	10.0
Preparatory education	9	11.3
Secondary education	47	58.7
University education	16	20.0
Occupation:		
Employee	23	28.7
House wife	57	71.3
Pregnancy duration:		
Complete	68	85.0
In complete	12	15.0
Medication:		
Yes	31	38.7
No	49	61.3
Type of medication intake during pregnancy:		
Antibiotic	6	19.3
Antiemetic	13	41.9
Calcium	10	32.3
VitB6	2	6.5
Residence:		
Urban	53	66.2
Rural	27	33.8

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Table (2): Percentage Distribution of the Studied Infants Related to Socio Demographic Characteristics.

Socio demographic characteristics of the studied infant	The studied infant (n=80)	
	No	%
Infant age:		
< 3 months	28	35.0
3-5 m	28	35.0
More than 5 m	24	30.0
Mean ±SD	4.06±2.74	
Birth order of the infant:		
First	40	50.0
Second	27	33.8
Third	13	16.2
Sex:		
Male	46	57.5
Female	34	42.5
Type of labor:		
Normal	22	27.5
Cesarean section	58	72.5
Infant's birth weight:		
LBW	17	21.3
Normal	63	78.7
Mean ±SD	3.04±0.35	
Symptoms appear on the infant:		
All symptoms of congenital nasolacrimal duct obstruction	80	100.0
Infant age when symptoms appear:		
From birth to≤6months	67	83.7
6>12months	13	16.3
Mean ±SD	4.06±2.75	
Eye obstruction place:		
One side(unilateral)	62	77.5
Both sides(bilateral)	18	22.5
Was temperature increase with symptoms?		
Yes	24	30.0
No	56	70.0

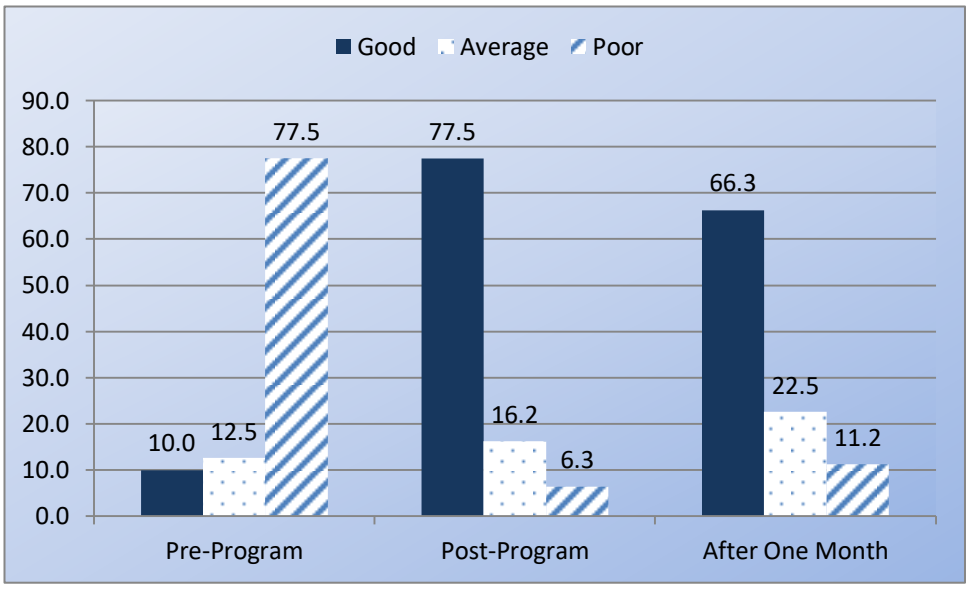

Figure (1): Studied mothers' total knowledge regarding congenital nasolacrimal duct obstruction

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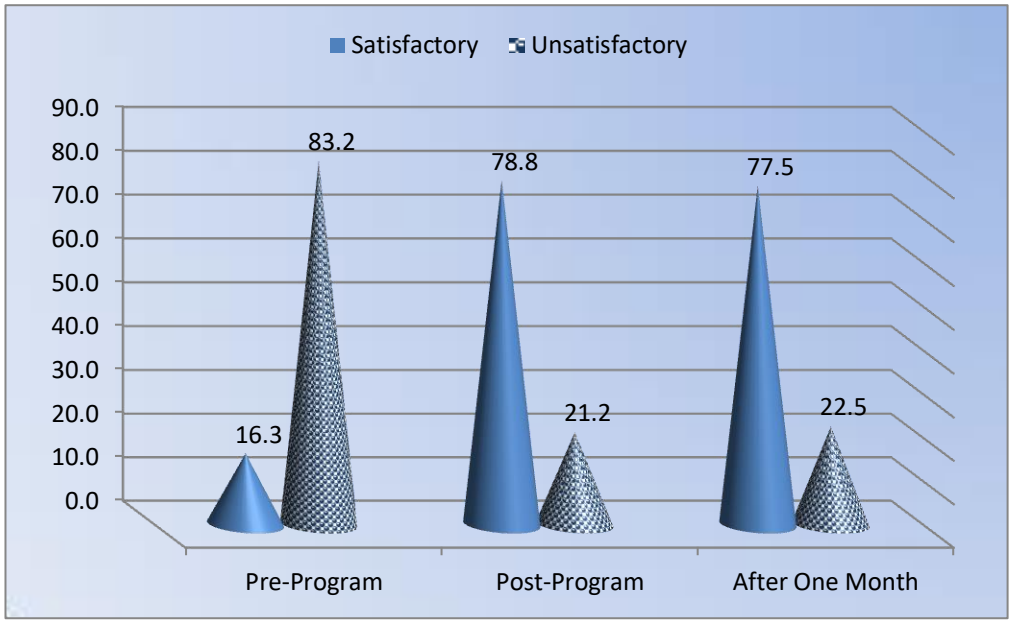

Figure (2): Mothers' total practice regarding congenital nasolacrimal duct obstruction.

Table (3): Percentage Distribution of Studied Infants Regarding Clinical Outcomes (n=80).

Studied Infants regarding Clinical Outcomes	Before program		Immediate post program		After one month		$X^2$1/ p-value	$X^2$2/ p-value	$X^2$3/ p-value
	No	%	No	%	No	%			
Eye redness									
Worse	80	100.0	3	3.7	0	0.0	148.4/ 0.000**	60.0/ 0.000**	160.0/ 0.000**
Not improved	0	0.0	10	12.5	0	0.0			
Slightly improved	0	0.0	46	57.5	11	13.8			
Improved	0	0.0	21	26.3	69	86.2			
Eye secretion									
Worse	80	100.0	4	5.0	0	0.0	144.7/ 0.000**	20.2/ 0.000**	160.0/ 0.000**
Not improved	0	0.0	13	16.3	0	0.0			
Slightly improved	0	0.0	13	16.2	11	13.8			
Improved	0	0.0	50	62.5	69	86.2			
Eyelid swelling									
Worse	80	100.0	5	6.3	0	0.0	141.1/ 0.000**	21.3/ 0.000**	160.0/ 0.000**
Not improved	0	0.0	8	10.0	0	0.0			
Slightly improved	0	0.0	17	21.2	16	20.0			
Improved	0	0.0	50	62.5	64	80.0			
Eyelid inflammation									
Worse	80	100.0	7	8.8	0	0.0	134.2/ 0.000**	24.5/ 0.000**	160.0/ 0.000**
Not improved	0	0.0	13	16.2	0	0.0			
Slightly improved	0	0.0	16	20.0	14	17.5			
Improved	0	0.0	44	55.0	66	82.5			
Epiphora									
Worse	80	100.0	6	7.5	0	0.0	137.6/ 0.000**	37.0/ 0.000**	160.0/ 0.000**
Not improved	0	0.0	13	16.2	0	0.0			
Slightly improved	0	0.0	23	28.8	13	16.2			
Improved	0	0.0	38	47.5	67	83.8			

Highly statistically significance P<0.001

$X^2$1 between pre and immediate post program implementation.

$X^2$2 between immediate post program and after one month program.

$X^2$3 between pre and after one.

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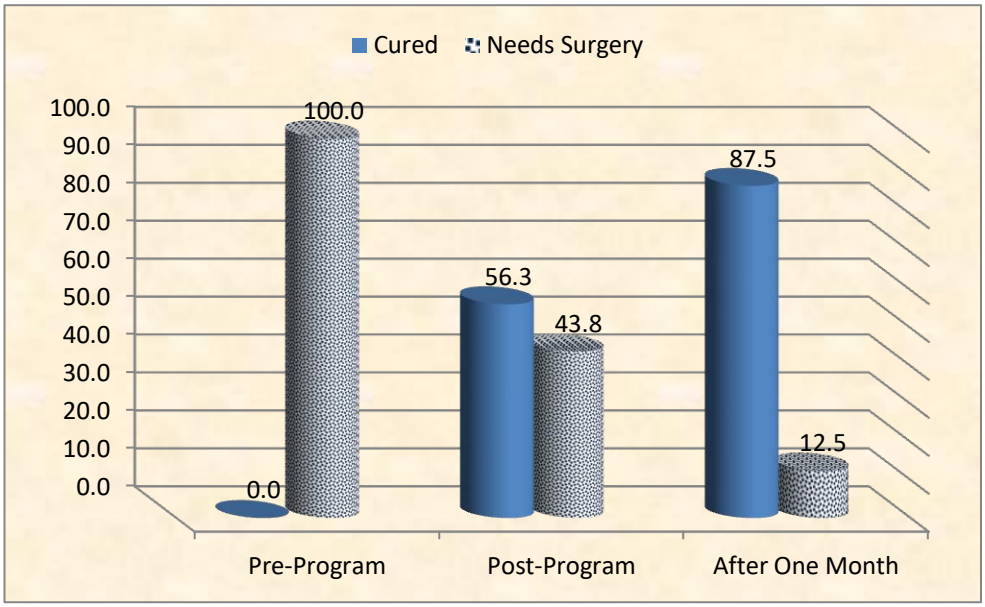

Figure (3): Studied infants regarding condition progress through the program phases.

Table (4): Correlation between Mothers' Total Knowledge and Practices Regarding Congenital Nasolacrimal Duct Obstruction.

Total practice score	Total Knowledge among the studied mothers					
	Before program		Immediate post program		After one month	
	r	p-value	R	p-value	R	p-value
	0.50	0.000**	0.04	0.71	0.31	0.005*

*** Statistically significant (P<0.05)**

Table (5): Relation between Total Practice Score of Studied Mothers and their Socio demographic Characteristics.

Socio demographic characteristics of the studied mothers	Before program				Immediate Post Program				After one month			
	Unsatisfactory (n=67)		Satisfactory (n=13)		Unsatisfactory (n=17)		Satisfactory (n=63)		Unsatisfactory (n=18)		Satisfactory (n=62)	
	No	%	No	%	No	%	N	%	No	%	No	%
Age in years:												
<25	18	26.9	3	23.1	4	23.5	17	27.0	6	33.3	15	24.2
25-<30	32	47.8	4	30.8	6	35.3	30	47.6	7	38.9	29	46.8
30+	17	25.4	6	46.2	7	41.2	16	25.4	5	27.8	18	29.0
	X^2= 2.393 p-value= 0.302				X^2= 1.672 p-value = 0.433				X^2= 0.644 p-value = 0.725			
Education level:												
Read& Write	4	6.0	4	30.8	0	0.0	8	12.7	3	16.7	5	8.1
Preparatory education	8	11.9	1	7.7	2	11.8	7	11.1	3	16.7	6	9.7
Secondary education	40	59.7	7	53.8	12	70.6	35	55.6	10	55.6	37	59.7
University education	15	22.4	1	7.7	3	17.6	13	20.6	2	11.1	14	22.6
	X^2= 8.11 p-value= 0.044				X^2= 6. 9 p-value=0.008				X^2= 5.4 p-value= 0.02			
Occupation:												
Employee	20	29.9	3	23.1	6	35.3	17	27.0	6	33.3	17	27.4
House wife	47	70.1	10	76.9	11	64.7	46	73.0	12	66.7	45	72.6
	X^2=0.244 p-value=0.621				X^2= 7.15 p-value<0.05*				X^2= 0.238 p-value= 0.626			
Residence:												
Urban	42	62.7	11	84.6	9	52.9	44	69.8	12	66.7	41	66.1
Rural	25	37.3	2	15.4	8	47.1	19	30.2	6	33.3	21	33.9
	X^2= 2.342 p- value= 0.126				X^2= 1.71 p-value= 0.191				X^2=0.002 p-value=0.966			

*Statistically significant difference at (P<0.05)

Table (6): Relation between Total Practices score of the studied mothers and their Infants Clinical Outcomes Immediate and after One Month Program Implementation.

Studied Infants clinical outcomes	Immediate post program				After one month			
	Unsatisfactory (n=17)		Satisfactory (n=63)		Unsatisfactory (n=18)		Satisfactory (n=62)	
	No	%	No	%	No	%	No	%
Needs surgery	10	58.8	25	39.7	4	22.2	6	9.7
Cured	7	41.2	38	60.3	14	77.8	56	90.3
	X2 =1.99	p-value =0.15			X2 =1.96	P value =0.16		

5. DISCUSSION

Congenital obstruction of the nasolacrimal duct is one of the most common congenital abnormalities in infants; it is the most common cause of epiphora which represents twenty percent of all neonates suffering from it during the first year of life which may lead to infections, such as orbital cellulitis, dacryocystitis, and bacterial conjunctivitis. A delay in the maturation of the lacrimal apparatus where it enters the nose, results in a persistent membranous obstruction at the valve of Hasner (HV) that causes congenital nasolacrimal duct obstruction in infants. Most cases resolve after lacrimal sac massage. Resolution of nasolacrimal duct obstruction without surgery ranges from one third to ninety five percent by13 months of age. [13, 14, 1 6, 17]

Based on the results of the present study, slightly less half of the studied mothers' age ranged from (25-30) years this finding was congruent with **Faisal et al. (2014)** who conducted a study about "risk factors for developing congenital nasolacrimal duct obstruction", which documented that more than three quarters of the mothers aged between 25-40 year.[18]

Concerning educational level of mother, the current study found that about more than half of the studied mothers had a secondary education while least of them only read and write and slightly less than one quarter of them had university education .This could be due to social differences. This finding disagrees with the result of **Faisal et al. (2014)** who found that more than half of mothers had university degree and above. [18]

Concerning of pregnancy duration the current study revealed that the majority of mothers most of them had full term pregnancy period and three quarter of them had normal birth weight but less than one fifth of them had incomplete pregnancy and less than one quarter of them had low birth weight. This could be due to different sample.This finding disagrees with **Lorena (2013)** who conducted a retrospective study about "congenital nasolacrimal duct obstruction in premature" to determine the incidence of congenital nasolacrimal duct obstruction (CNLDO) in premature and full term children. [19]

Regarding to the type of labor, the current study showed that slightly less than three quarter of the mothers had cesarean section while and twenty seven percent of them had normal labor. This finding was congruent with **Shweta et al. (2018) and Kuhli H et al. (2016)**.who conducted a study about" Congenital Nasolacrimal Duct Obstruction and Its Association With the Mode of Birth" To assess the association of congenital nasolacrimal duct obstruction (CNLDO) with mode of birth (vaginal or cesarean) and found that less than half of them were vaginal deliveries and more than half of them were cesarean sections. [20, 21]

Regarding to infants gender, the findings of the current study showed that more than half of them were male and more than one third of them were female infants. This difference could be due to different sample selection. This result disagreed with **Omayma M et al. (2016)** who found that the majority of the sample was female. [22]

Regarding eye obstruction place of the congenital nasolacrimal duct obstruction the present study revealed that more than three quarter of the infants had unilateral CNLDO as symptoms appear in one eye while less than one quarter of them had symptoms in both eyes (bilateral). This could be due to pathological persistence of the membrane at the distal portion of the NLD. This finding consistent with **Okby, et al., (2016)** who found that most of the infants in both study and control

group had unilateral congenital nasolacrimal obstruction most of experimental group and slightly less than three quartet of control group. [12]

Concerning knowledge and practices of the mothers about congenital nasolacrimal duct obstruction before educational training program, the present study showed that more than three quarter of the mothers had poor knowledge and majority of them had unsatisfactory practices in caring for their infants with congenital nasolacrimal duct obstruction. This result was congruent with **Nishith et al. (2016)** Who conducted a prospective study about ‘‘Role of office sac massage for congenital nasolacrimal duct obstruction in various age-groups**,,** and found that the correct technique of massage is not properly understood by most parents resulting in a high failure rate and need for probing. [23]

This educational training program lead to significant improvement in mothers' knowledge reach to more than three quarter of them immediate post program and two thirds after one month program implementation. Also lead to significant improvement in mothers practices regard nasolacrimal duct obstruction more than three quarter immediate following educational training program and after one month this could be due to presence of booklet using suitable teaching methods. [23, 24]

This finding was consistent with **Ying (2018)** who conducted a study about “lacrimal sac compression not massage” in a randomized prospective trial comparing different massage techniques, and showed that mothers may not perform the massage correctly and were often frustrated with its lack of efficacy, but after educating the mother the effective method of nasolacrimal duct massage he found that the hydrostatic massage group has statistically significance improvement in resolution rates when compared to the gentle massage. [24]

Concerning of relieving signs and symptoms of congenital nasolacrimal duct obstruction after educational training program. The current study showed that educational training program revealed to high significant improvement in the signs and symptoms of infants of mothers who followed the educational training program in the different components of resolution of nasolacrimal duct obstruction aspect care. [12]

As improved condition after one month program implementation was majority of them improved for eye redness and secretion, most of the infants for eyelid swelling, majority of them for eyelid inflammation and epiphora this could be attributed to the selection of suitable teaching methods e.g. demonstration and re-demonstration for proper technique of massage. Written booklet was given to the mothers to follow it as needed. This finding consistent with **Okby et al. (2016)** who showed high significant improvement of signs and symptoms of NLDO. As More than half of the infants who had therapeutic hydrostatic nasolacrimal massage didn’t develop epiphora. [12]

This result also supported with **Dotan et al. (2014)** who conducted study about ‘‘ Hydrostatic pressure as an office procedure for congenital nasolacrimal duct obstruction,, to examine success rate of treating CNDO with hydrostatic pressure (the Crigler method) as an office procedure on a total of 742 children with CNDO initially were treated noninvasively with hydrostatic pressure. Success was defined as no epiphora or discharge. [25]

There had been higher significant percentage of improvement of infant’s condition that reached to slightly less than two third of them had cured immediate post program while most of infants had cured after one month program implementation. This could be due to that more three quarter of the infants had unilateral obstruction and resolution of CNLDO also occurred faster in unilateral disease than bilateral disease consistent with prior reports and more than half of the infants were male and resolution faster in boys than in girls this due to the nasolacrimal canal and fossa of girls is a mean of 0.35 mm smaller than boys. [26]

This result showed relation between mothers' knowledge, practice and socio demographic Characteristics. There was statistical significant difference regarding to the educational level and their total knowledge scores. This can explained from the viewpoint that mothers who had high education level had good knowledge and practice, in addition older age better than young age and experience also play important role to gain adequate knowledge. This was in the same line **potter et al (2018)** who found that, urban area and older age made the mothers had good knowledge and practice. [27]

The current study provided objective explanation for the efficacy of the educational training program in teaching mothers and follow up of conservative treatment on resolution of congenital nasolacrimal duct obstruction under first year of age. Emphasizing the importance of lacrimal massage and describing to the mothers in detail it can reduce the risk of

unnecessary surgical interventions and it is subsequent complications. This study was supported by **Nair (2016)** who conducted a randomized survey to assess the preferred practice patterns in the management of CNLDO among oculoplastic surgeons in India and documented that large proportion of respondents indicated that they advise lacrimal sac compression up to one year of age. [28]

6. CONCLUSION

Based on the findings of the present study, it can be concluded that, there were improvement in mother's knowledge and practice after educational training program implementation and there was statistic significant difference between total mothers knowledge and practice before, immediate and after one month from educational training program implementation and subsequently lead to high rates improvement of infants' clinical outcomes and resolution of congenital nasolacrimal duct obstruction.

Based on the findings of the present study, the following can be recommended.

- Health education for mothers to care of their infants with congenital nasolacrimal duct obstruction and importance of nasolacrimal duct massage because this can reduce the risk of unnecessary surgical interventions and subsequent complications.
- Follow up program of the infants with CNLDO should be applied and organized in the hospitals, for the proper conservative treatment application, ensure that mothers follow correct practices , reliving of the signs and symptoms and prognosis of CNLDO on the infants,
- More researches are needed for training of pediatric nurses, about the proper care of CNLDO and improving mothers' knowledge and practices about the nature of the disease, different forms of management, complications and its prognosis.

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