

# The Effect of an Educational Program for Nurses and the Family Caregivers about the Care of Diabetic Retinopathy Patients with Laser Photocoagulation Surgeries

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**Abstract:** Diabetic retinopathy DR is a complication of DM that affects the blood vessels of the retina and leads to blindness. Laser treatment is used to treat new blood vessels at the back of the eyes in the advanced stages of diabetic retinopathy. Staff education is an essential part of vitreoretinal VR in the care of VR patients.

**Aim of the study:** To evaluate the effect of educational health program for the nurses and the family caregivers about care of diabetic retinopathy patients with Laser Photocoagulation surgeries.

**Subjects and Method** A quasi-experimental design was utilized in this study, it was carried out in ophthalmology unit affiliated to Tanta University Hospital, a convenient sample consisted of all (30) available nursing staff working at above-mentioned setting. Two tools were used the structure questionnaire sheet and observational checklist.

**Results:** There are highly significant differences in relation to the nurses' total practice level among preoperative immediate postoperative and after two months postoperatively, mean  $\pm$  SD = 12.13 $\pm$ 1.613, 43.00 $\pm$ 0.00, 38.70 $\pm$ 13.121 respectively

**Conclusion:** The teaching program significantly improves nurses' knowledge and practice about Laser photocoagulation surgery for diabetic retinopathy patients with a sustained improvement in clinical outcomes and reduce complications.

**Keywords:** Diabetic Retinopathy, Laser Photocoagulation Surgery.

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## 1. INTRODUCTION

Throughout the world, a diabetes mellitus (DM) is considering a major medical problem. Diabetes causes an array of long-term systemic complications that have considerable impact on the patient, family, and society, as the disease typically affects individuals in their most productive years. <sup>(1)</sup> The prevalence of diabetes is increasing throughout the world <sup>(2)</sup>, and this increase appears to be greater in developing countries. Diabetic retinopathy DR is a major a complication of DM that affects the blood vessels of the retina and leads to blindness. The progression of retinopathy is gradual, advancing from mild abnormalities, characterized by increased vascular permeability and growth of new blood vessels on the retina and on the posterior surface of the vitreous. <sup>(3)</sup>

The annual incidence of retinopathy requiring ophthalmologic follow-up or treatment has been reported to average 1.5% after 1 year. The same source estimates that 6-9% of patients with proliferative retinopathy or severe non-proliferative disease would become blind each year<sup>(4)</sup>. Moreover, growing evidence also suggests that, after 15 years of diabetes, ~2% of patients develop blindness, whereas about 10% develop severe visual handicap. Type and duration of DM, age, sex, glycemic control, hypertension, BMI, smoking, serum lipids, and presence of microalbuminuria are the main factors have been identified as determinants for the development of DR and its progression.<sup>(5,6)</sup> Initially, DR usually manifests as a gradual, painless progression of vision loss; however, visual loss may occur with vitreous hemorrhage or macular edema (thickening of the central part of the back layer of the eye, the retina). Symptoms may fluctuate throughout each day and from day to day. The available treatments include laser photocoagulation, vitrectomy and intravitreally injected steroids and anti-vascular endothelial growth factor which can halt the progress of neovascularization<sup>(7)</sup> Laser treatment is used to treat new blood vessels at the back of the eyes in the advanced stages of diabetic retinopathy. This is done because the new blood vessels tend to be very weak and often cause bleeding into the eye<sup>(8)</sup>.

The complications of diabetes can have a devastating effect on patients and their families. This is often intensified by the loss of a patient's ability to self-manage, which may have physical and psychosocial implications. All nurses who care for patients with diabetes have an important role to play in preventing complications, and it is important to establish clear communication between the health professionals in different disciplines in all settings who provide care for these patients<sup>(9)</sup>.

Community health nurses as the main interdisciplinary team members play an important role in the prevention and management of chronic diseases such as cardiovascular diseases, diabetes, respiratory diseases, and cancer. These nurses are at the front line and are the most reliable point of communication with the patients, and in most of the cases, are in the best situation to collect data about the patients' families and the effective socio-cultural and economic factors in designing interventional plans<sup>(10)</sup>. Staff education is an essential part of vitreoretinal VR nurse's role. Acting as a role model in the care of VR patients. The nurse provides formal/informal education and act as a resource for the staff and keep them updated in development to facilitates ongoing learning. Patient education plays an important role in the management of retinopathy, as increased awareness is linked with motivation to adhere to self-management goals. Patients with sight-threatening retinopathy may need counseling regarding a potential loss of vision as well as a clear explanation of the treatment options<sup>(9,11)</sup>. There is a need for nurses as diabetes educators, and health care providers, to assume a major role in expanding support resources that can be provided for patients with diabetes. Education and support needs of diabetes patients require health care professionals to develop new kinds of partnerships to improve patient self-care<sup>(12)</sup>.

#### **Significant of the problem:**

In Egypt the prevalence of DM 5–10% in the 1990s<sup>(13-15)</sup>. It has been estimated that by the year 2025, nearly 9 million Egyptians (over 13% of the population over 20 years of age) will have DM. Epidemiological studies of DM<sup>(16,17)</sup> and diabetic retinopathy (DR) in Middle Eastern countries including Egypt have shown a substantial heterogeneity in the reported prevalence of DM (3.4–29%) and its complications especially DR (7.6–60%), even within the same country<sup>(18,19)</sup>. The aim of the current study was to evaluate the effect of an educational health program for the nurses and the family caregivers about care of the diabetic retinopathy patients with Laser Photocoagulation surgeries.

#### **Aim of the study:**

To evaluate the effect of an educational health program for the nurses and the family caregivers about the care of diabetic retinopathy patients with Laser Photocoagulation surgeries.

#### **The hypothesis of the study:**

To achieve the aim of this study, it was hypothesized that,

- The level of knowledge and the practices of the nurses and the family caregivers about Laser Photocoagulation surgery are inadequate.
- The implementation of an educational health program will lead to the significant improvement of knowledge and the practices among the nurses and the family caregivers who provide the care for diabetic retinopathy patients with Laser Photocoagulation surgeries.

## 2. SUBJECTS AND METHOD

### Subject:

**Design:** A quasi-experimental design was utilized in this study.

**Setting:** The study was carried out in the ophthalmology unit affiliated to Tanta University Hospital,

### Sample:

A convenient sample consisted of all (30) available nursing staff working at the above-mentioned setting.

### Tools of the study:

To collect data the necessary for this study, a questionnaire was employed. The questionnaire included two tools.

**Tool (I): - The knowledge of the nurses about laser photocoagulation surgery for diabetic retinopathy patients;** which included two parts as follow:

**Part one:** included the nursing staff personal characteristics such as age, gender, marital status, years of experience, level of education, department, and previous training courses.

**Part two:** It was developed by the researchers based on the related literature <sup>(4,5,7)</sup> to assess knowledge of the nurse about laser photocoagulation surgery for diabetic retinopathy patient. It included the questions about anatomy and physiology of the eyes, risk factors for retinopathy, signs and symptoms, preventive measures, treatment options of the disease, indications of laser photocoagulation surgery and management of the patient pre, postoperative and the health education to the client and his or her family caregiver. It was composed of 12 close ended questions. Each correct and complete answer was given 2 score, incomplete answer was given 1 score and while wrong and no answer was given zero score. The total scores ranged from 0 to 24. The total level of knowledge was categorized as follows:  $\leq 50\%$  was graded as poor, or unsatisfied,  $50\%$  to  $<75\%$  score was graded as a fair or satisfied and  $\geq 75\%$  score was graded as a good.

**Tool II: Observational checklist, it was developed by the researchers based on the related literature <sup>(8,9,10)</sup> to assess the practices of the nurses about: -**

**a. Patient's assessment, and the preparation before the surgery:** as assess the visual acuity of the client's non-operative eye prior to surgery, possible effect of impaired vision on lifestyle and ability to perform ADLs in the postoperative period, the safety measures such as installing handrails, teach the client measures to prevent eye injury postoperatively, avoid vomiting, straining at stool, coughing, sneezing, lifting more than 5 kg, and bending over at the waist, remove all eye makeup and contact lenses or glasses prior to surgery, administer preoperative medications and eye drops or ointments as prescribed.....etc.

**b. Post-operative procedure checklist:** as monitor status of the eye dressing, assess dressings for the presence of bleeding or drainage from the eye, assess for the potential surgical complications as pain in or drainage from the affected eye, hemorrhage, flashes of light, floaters or cloudy appearance to the cornea.

**c. Client and Family caregiver teaching about:** the proper way to instill eye drops, the name, dosage, schedule, duration, purpose, and side effects of postoperative medications, the proper use of the eye patch and eye shield, to avoid scratching, rubbing, touching, or squeezing the affected eye, avoid constipation and straining, and activity limitations, report to the physician eye pain or pressure, redness or cloudiness, drainage, decreased vision, controlling blood glucose, diet, exercises and medications. one score was given for each step that was done correctly, and zero score for step that was not done. The total level of the practices score was categorized as: less than 60% of total score was considered a poor, from 60% to less than 75% was considered a fair, and from 75% and more was considered a good.

### Method:

#### 1-Administrative process:

- Official permission to carry out the study was obtained from the responsible authority of Ophthalmology Department and College of Nursing, Tanta University before conducting this study.

**2- Nurse's informed consent** to participate in the study was obtained after the researcher explained to the nurses the objective of the study.

### 3- Pilot study:

The pilot study was conducted on five nurses after taking their oral approval; they were excluded from the study sample. It is done to test the clarity, feasibility, and applicability of the study tools. Modifications and omissions of some details were done and then the final forms were developed based on the result of the pilot study.

### 4- Validity of the tools

All tools were tested for content validity by nine juries of experts in the field of Medical-Surgical Nursing, Critical Care Nursing, and Community Health Nursing at the Faculty of Nursing, and Ophthalmology field professors and accordingly needed modifications were done.

### 5- Data collection

Data were collected over a period of 5 months, started from September 2017 to January 2018. Each nurse was individually interviewed to fulfill the sheet questions. Each interview lasted for about 30-45 minutes to complete the tools. Each nurse was observed in 2 shifts at the morning shift and the afternoon shift for three times. The time needed to complete the checklist varies ranged from 30-45 minutes depending upon the time of the procedure inside the department.

### The study was conducted on four phases which included the following: -

1. **Assessment phase:** Two tools were used to collect the data, the questionnaire and checklist of the practices of ophthalmology nurses.

- **The tool I:** The questionnaire assessment sheet included the demographic characteristics, part one, two and four translated into The Arabic language by the researchers based on the literature review, they were filled by the nurses.

- **Tool II:** An observational checklist of the nurses' management of patients pre and postoperatively was filled by the researchers it was filled three times as mentioned previously. It assessed nurses' practices of the nurses regarding preoperative assessment and care postoperative care, the patient and the family caregiver health education

2. **Planning phase:** In this phase, a plan was formulated for each nurse based on assessment phase and literature review, the researchers prepared the training places, teaching aids and media (videos, picture, and handouts). A booklet as a teaching aid was prepared, and then revised by a group of experts in Medical Surgical Nursing and Community Health Nursing at faculties of Nursing for the content validity.

### 3. Implementation Phase:

A clear and simple explanation was offered to the patients about the aim of the study and its expected outcomes for them. The total numbers of 30 nurses were divided into 6 groups from 5 nurses and the total studying sessions were 5 sessions; 2 sessions for theoretical part and other 3 sessions for the practices and the demonstration. The program was introduced over a period of 5 weeks, 2 sessions/ week. Each session ranged from 45-60 minutes. A copy from a booklet was given to each nurse. The teaching/training methods were: discussions, as well as demonstration and re-demonstration. The teaching media were: illustrative pictures, PowerPoint presentation, doll, and handouts. Sessions took 45-60 minutes. The teaching was designed and presented in the Arabic language. At the beginning of the first session, an orientation to the health guideline and its purpose was presented. Each session started with a summary of what had been taught in the previous session and the objectives of the new one, taking into consideration the use of simple language to suit the level of the nurse. The researchers used motivation and reinforcement during the educational sessions to enhance learning. The booklet and PowerPoint were prepared by the researchers based on the literature review. The booklet was distributed to the studied nurses at the end of sessions as a copy to use it.

### Description of educational program:

**The aim of the program:** To provide the nurses the knowledge and the practices about laser photocoagulation surgery for diabetic retinopathy patients.

**Content:** Intervention program was developed by the researchers based on the related literature. Knowledge about anatomy and physiology of the eyes, risk factors for retinopathy, signs and symptoms, preventive measures, treatment options of the disease, indications of laser photocoagulation surgery and the management of patient pre, postoperative and the health education to the client and his or her family caregiver.

**Division of sessions:**

**Two theoretical sessions**

**One Session** included an introduction to anatomy and physiology of the eyes, a definition of disease, risk factors and causes of the disease, signs, and symptoms and complications of the disease.

**One Session** included preventive measures, treatment options of the disease, indications of laser photocoagulation surgery and management of patient pre, postoperative and health education to client and his or her family.

**Three practical sessions:**

**Two sessions** included pre and post-operative care of the patient **preparation before surgery** as Assess the visual acuity of the client’s nonoperative eye prior to surgery, possible effect of impaired vision on lifestyle and ability to perform ADLs in the postoperative period, safety measures such as installing handrails, teach the client measures to prevent eye injury postoperatively, avoid vomiting, straining at stool, coughing, sneezing, lifting more than 5 kg, and bending over at the waist, remove all eye makeup and contact lenses or glasses prior to surgery, administer preoperative medications and eye drops or ointments as prescribed.....etc.

**Post-operative procedure checklist** as Monitor status of the eye dressing, Assess dressings for the presence of bleeding or drainage from the eye, Assess for potential surgical complications as pain in or drainage from the affected eye, hemorrhagic. Flashes of light, floaters or cloudy appearance to the cornea.

**One Sessions- Client and Family Teaching about** The proper way to instill eye drops, The name, dosage, schedule, duration, purpose, and side effects of postoperative medications, the proper use of the eye patch and eye shield, to avoid scratching, rubbing, touching, or squeezing the affected eye, avoid constipation and straining, and activity limitations, report to the physician eye pain or pressure, redness or cloudiness, drainage, decreased vision, controlling blood glucose, diet , exercises and medications .about included

**4. Evaluation phase:**

The evaluation of the effectiveness the educational program was carried out immediately post-program implementation and after two months using the pre-test questionnaire and the observation checklist.

**Statistical analysis:**

The analysis was performed using statistical software SPSS version 16. For quantitative data, the mean and standard deviation were calculated, Chi-square test ( $\chi^2$ ). 1-way ANOVA test was used. Correlation between variables was evaluated using Pearson’s correlation coefficient (r). A significance was adopted at  $P < 0.05$  for clarification of results of tests of significance

**Table (1): Distribution of socio-demographic data among the studied nurses**

Personal data	The studied nurses (n=30)	
	N	%
<b>Age</b>		
▪ 20 -< 29 years	10	33.3
▪ 29 -<39 years	10	33.3
▪ 39 -<49 years	5	16.7
▪ ≥49 years	5	16.7
<b>Sex</b>		
▪ Male	0	0.0
▪ Female	30	100.0
<b>Educational level</b>		
▪ Diploma of Nursing	13	43.3
▪ Diploma above the average	8	26.7
▪ Bachelor of Nursing	5	16.7
▪ Other	4	13.3

<b>Marital Status</b>		
▪ Married	27	90.0
▪ Divorced	1	3.3
▪ Widowed	2	6.7
<b>Occupation</b>		
▪ Nurse	20	66.7
▪ Supervisor Nurse	8	26.7
▪ Head Nurse	2	6.7
<b>Experience as a nurse</b>		
▪ More than 10 years	30	100.0
<b>Experience in ophthalmology department</b>		
▪ Less than 5 years	3	10.0
▪ From 5 to 10 years	7	23.3
▪ More than 10 years	20	66.7
<b>Previous training courses</b>		
▪ No	30	100.0

**Table (1):** Shows the distribution of socio-demographic data among studied nurses. About two thirds of the nurses (66.6%) aged from 20 - ≥ 39 years, all participant nurses were females and 90% of them married, 43.3% of them had middle education diploma of nursing and all of them (100%) had experience more than 10 years, 66.7% of them had experience in ophthalmology department more than 10 years and all of them didn't have previous training courses in the care of the diabetic retinopathy patients in ophthalmology department.

**Table (2):** Distribution of knowledge items among the studied nurses throughout periods of study

Knowledge items	The studied nurses (n=30)						χ <sup>2</sup> P
	Pre		Immediate		Post 2 months		
	N	%	N	%	N	%	
<b>1. How the eye works</b>							<b>73.54</b> <b>0.00*</b>
▪ Incorrect	7	23.3	0	0.0	0	0.0	
▪ Incomplete correct	23	76.7	0	0.0	5	16.7	
▪ Complete correct	0	0.0	30	100.0	25	83.3	
<b>2. What do you know about diabetic retinopathy</b>							<b>72.47</b> <b>0.00*</b>
▪ Incomplete correct	30	100.0	0	0.0	5	16.7	
▪ Complete correct	0	0.0	30	100.0	25	83.3	
<b>3. What are the symptoms of diabetic retinopathy</b>							<b>76.52</b> <b>0.00*</b>
▪ Incorrect	17	56.7	0	0.0	0	0.0	
▪ Incomplete correct	13	43.3	0	0.0	5	16.7	
▪ Complete correct	0	0.0	30	100.0	25	83.3	
<b>4. What are the risk factors for diabetic retinopathy?</b>							<b>98.18</b> <b>0.00*</b>
▪ Incorrect	30	100.0	0	0.0	0	0.0	
▪ Incomplete correct	0	0.0	0	0.0	5	16.7	
▪ Complete correct	0	0.0	30	100.0	25	83.3	
<b>5. What types of retinopathy</b>							<b>98.18</b> <b>0.00*</b>
▪ Incorrect	30	100.0	0	0.0	0	0.0	
▪ Incomplete correct	0	0.0	0	0.0	5	16.7	
▪ Complete correct	0	0.0	30	100.0	25	83.3	
<b>6. What are the changes in the eyes caused by retinopathy</b>							<b>98.18</b> <b>0.00*</b>
▪ Incorrect	30	100.0	0	0.0	0	0.0	
▪ Incomplete correct	0	0.0	0	0.0	5	16.7	
▪ Complete correct	0	0.0	30	100.0	25	83.3	
<b>7. What are the treatment options of diabetic retinopathy?</b>							<b>72.47</b> <b>0.00*</b>
▪ Incomplete correct	30	100.0	0	0.0	5	16.7	
▪ Complete correct	0	0.0	30	100.0	25	83.3	

<b>8. What are the symptoms that require emergency and required visit the eye doctor?</b>							
▪ Incorrect	30	100.0	0	0.0	0	0.0	<b>98.18 0.00*</b>
▪ Incomplete correct	0	0.0	0	0.0	5	16.7	
▪ Complete correct	0	0.0	30	100.0	25	83.3	
<b>9. What is the role of the nurse with diabetic retinopathy</b>							
▪ Incomplete correct	30	100.0	0	0.0	7	23.3	<b>67.83 0.00*</b>
▪ Complete correct	0	0.0	30	100.0	23	76.7	
<b>10. What are the criteria that are taken into consideration before the patient exits after the surgery one day and the patient is discharged from the hospital?</b>							
▪ Incorrect	7	23.3	0	0.0	0	0.0	<b>69.69 0.00*</b>
▪ Incomplete correct	23	76.7	0	0.0	7	23.3	
▪ Complete correct	0	0.0	30	100.0	23	76.7	
<b>11. What is the role of the nurse in educating patients with diabetic retinopathy</b>							
▪ Incorrect	30	100.0	0	0.0	0	0.0	<b>101.89 0.00*</b>
▪ Incomplete correct	0	0.0	0	0.0	7	23.3	
▪ Complete correct	0	0.0	30	100.0	23	76.7	

\* Significant at level P < 0.05.

**Table (2):** Distribution of knowledge items among the studied nurses throughout the periods of study. There are highly significant differences regarding knowledge of the nurses about items of (definition, signs and symptoms, risk factors, options of treatment, role of nurse and health education for the diabetic retinopathy patients).

**Table (3):** Distribution of preoperative nursing care practice among the studied nurses throughout periods of study

Preoperative nursing Care	The studied nurses (n=30)						$\chi^2$ P
	Pre		Immediate		Post 2 months		
	N	%	N	%	N	%	
<b>1. Assess the visual acuity of the client's nonoperative eye prior to surgery</b>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37 0.00*</b>
▪ Done	0	0.0	30	100.0	27	90.0	
<b>2. The client with limited visual acuity in the nonoperative eye</b>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37 0.00*</b>
▪ Done	0	0.0	30	100.0	27	90.0	
<b>3. Assess the client's support systems</b>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37 0.00*</b>
▪ Done	0	0.0	30	100.0	27	90.0	
<b>4. Vision in the operative eye</b>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37 0.00*</b>
▪ Done	0	0.0	30	100.0	27	90.0	
<b>5. Safety measures such as installing handrails</b>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37 0.00*</b>
▪ Done	0	0.0	30	100.0	27	90.0	
<b>6. Teach the client measures to prevent eye injury postoperatively</b>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37 0.00*</b>
▪ Done	0	0.0	30	100.0	27	90.0	

7. <u>The client should avoid vomiting</u>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37</b>
▪ Done	0	0.0	30	100.0	27	90.0	<b>0.00*</b>
8. <u>These activities increase intraocular pressure</u>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37</b>
▪ Done	0	0.0	30	100.0	27	90.0	<b>0.00*</b>
9. <u>Remove all eye make -up and contact lenses</u>							
▪ Not done	0	0.0	0	0.0	3	10.0	<b>6.21</b>
▪ Done	30	100.0	30	100.0	27	90.0	<b>0.045*</b>
10. <u>Have glasses readily available for the client on return from surgery</u>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37</b>
▪ Done	0	0.0	30	100.0	27	90.0	<b>0.00*</b>
11. <u>Maintaining visual acuity in the unaffected eye</u>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37</b>
▪ Done	0	0.0	30	100.0	27	90.0	<b>0.00*</b>
12. <u>Administer preoperative medications and eye drops or ointments as prescribed</u>							
▪ Not done	0	0.0	0	0.0	3	10.0	<b>6.21</b>
▪ Done	30	100.0	30	100.0	27	90.0	<b>0.045*</b>

\* Significant at level P < 0.05.

**Table (3):** Distribution of preoperative nursing care practices among the studied nurses throughout periods of study. There are highly significant differences regarding the preoperative nursing care practice of the nurses about items of (assessment of visual acuity, administering medications and eye drops, having glasses available, and instructing the patients about avoidance of activity that providing intraocular pressure)

**Table (4):** Distribution of postoperative nursing care practices among the studied nurses throughout periods of study

Postoperative nursing care	The studied nurses (n=30)						$\chi^2$ P
	Pre		Immediate		Post 2 months		
	N	%	N	%	N	%	
1. <u>Assess dressings for the presence of bleeding</u>							
▪ Not done	5	16.7	0	0.0	3	10.0	5.21
▪ Done	25	83.3	30	100.0	27	90.0	0.074
2. <u>Maintain eye patch or eye shield in place</u>							
▪ Not done	0	0.0	0	0.0	3	10.0	<b>6.21</b>
▪ Done	30	100.0	30	100.0	27	90.0	<b>0.045*</b>
3. <u>Place the client in a semi-Fowler's or Fowler's position</u>							
▪ Not done	0	0.0	0	0.0	3	10.0	<b>6.21</b>
▪ Done	30	100.0	30	100.0	27	90.0	<b>0.045*</b>
4. <u>having the client lie on the unaffected side</u>							
▪ Not done	7	23.3	0	0.0	3	10.0	<b>8.33</b>
▪ Done	23	76.7	30	100.0	27	90.0	<b>0.016*</b>
5. <u>After surgery for a detached retina</u>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37</b>
▪ Done	0	0.0	30	100.0	27	90.0	<b>0.00*</b>



6. <u>Assess the client, and medicate or assist to</u>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37</b>
▪ Done	0	0.0	30	100.0	27	90.0	<b>0.00*</b>
7. <u>Assess comfort and medicate as necessary for complaints of an aching or scratchy sensation in affected eye</u>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37</b>
▪ Done	0	0.0	30	100.0	27	90.0	<b>0.00*</b>
8. <u>Immediately report any complaint of sudden</u>							
▪ Not done	7	23.3	0	0.0	3	10.0	<b>8.33</b>
▪ Done	23	76.7	30	100.0	27	90.0	<b>0.016*</b>
9. <u>Assess for potential surgical complications</u>							
a) <u>Pain in or drainage from the affected eye</u>							
▪ Not done	7	23.3	0	0.0	3	10.0	<b>8.33</b>
▪ Done	23	76.7	30	100.0	27	90.0	<b>0.016*</b>
b) <u>Hemorrhage with blood in the anterior chamber of the eye</u>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37</b>
▪ Done	0	0.0	30	100.0	27	90.0	<b>0.00*</b>
c) <u>Flashes of light, floaters, or the sensation of a curtain</u>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37</b>
▪ Done	0	0.0	30	100.0	27	90.0	<b>0.00*</b>
d) <u>Cloudy appearance to the cornea (corneal edema)</u>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37</b>
▪ Done	0	0.0	30	100.0	27	90.0	<b>0.00*</b>
10. <u>Early intervention is often necessary to preserve sight</u>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37</b>
▪ Done	0	0.0	30	100.0	27	90.0	<b>0.00*</b>
11. <u>Approach the client on the unaffected side</u>							
▪ Not done	0	0.0	0	0.0	3	10.0	<b>6.21</b>
▪ Done	30	100.0	30	100.0	27	90.0	<b>0.045*</b>
12. <u>Place all personal articles and the call bell within easy reach</u>							
▪ Not done	0	0.0	0	0.0	3	10.0	<b>6.21</b>
▪ Done	30	100.0	30	100.0	27	90.0	<b>0.045*</b>
13. <u>Assist with ambulation and personal care activities as need</u>							
▪ Not done	0	0.0	0	0.0	3	10.0	<b>6.21</b>
▪ Done	30	100.0	30	100.0	27	90.0	<b>0.045*</b>
14. <u>Administer antibiotic, anti-inflammatory, and other systemic and eye medications as prescribed</u>							
▪ Not done	0	0.0	0	0.0	3	10.0	<b>6.21</b>
▪ Done	30	100.0	30	100.0	27	90.0	<b>0.045*</b>
15. <u>maintain pupil constriction, and control intraocular pressure</u>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37</b>
▪ Done	0	0.0	30	100.0	27	90.0	<b>0.00*</b>
16. <u>Administer antiemetic medication as needed</u>							
▪ Not done	0	0.0	0	0.0	3	10.0	<b>6.21</b>
▪ Done	30	100.0	30	100.0	27	90.0	<b>0.045*</b>

\* Significant at level  $P < 0.05$ .

**Table (4):** Distribution of postoperative nursing care practices among the studied nurses throughout periods of study. There are highly significant differences regarding the post-operative nursing care practice of the nurses about items of

(maintaining of eye patch in place, placing patient in fowler's position, giving antiemetic medication reporting any sudden complaint and reporting eyes pain, photophobia, flashes of light, floaters, Hemorrhage with blood in the anterior chamber of the eye).

Table (5): Distribution of client and family caregiver teaching items among the studied nurses throughout periods of study

Client and family caregiver teaching	The studied nurses (n=30)						$\chi^2$ P
	Pre		Immediate		Post 2 months		
	N	%	N	%	N	%	
1. <u>The proper way to instill eye drops</u>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37</b>
▪ Done	0	0.0	30	100.0	27	90.0	<b>0.00*</b>
2. <u>The name, dosage, schedule, duration, purpose, and side effects of postoperative medications</u>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37</b>
▪ Done	0	0.0	30	100.0	27	90.0	<b>0.00*</b>
3. <u>The proper use of the eye patch and eye shield</u>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37</b>
▪ Done	0	0.0	30	100.0	27	90.0	<b>0.00*</b>
4. <u>The need to avoid scratching, rubbing, touching, or squeezing the affected eye</u>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37</b>
▪ Done	0	0.0	30	100.0	27	90.0	<b>0.00*</b>
5. <u>Measures to avoid constipation and straining, and activity limitations</u>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37</b>
▪ Done	0	0.0	30	100.0	27	90.0	<b>0.00*</b>
6. <u>Symptoms that should be reported to the physician, including eye pain or pressure</u>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37</b>
▪ Done	0	0.0	30	100.0	27	90.0	<b>0.00*</b>
7. <u>The need to wear sunglasses with side shields when outdoor</u>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37</b>
▪ Done	0	0.0	30	100.0	27	90.0	<b>0.00*</b>
8. <u>Photophobia is common after eye surgery</u>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37</b>
▪ Done	0	0.0	30	100.0	27	90.0	<b>0.00*</b>
9. <u>Remind the client that vision may not stabilize for several weeks following eye surgery</u>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37</b>
▪ Done	0	0.0	30	100.0	27	90.0	<b>0.00*</b>
10. <u>New corrective lenses, if necessary, are not prescribed until vision has stabilized</u>							
▪ Not done	30	100.0	0	0.0	3	10.0	<b>78.37</b>
▪ Done	0	0.0	30	100.0	27	90.0	<b>0.00*</b>

11. Clients may be need reassurance that visual acuity usually improves with time and healing of the affected eye							
▪ Not done	30	100.0	0	0.0	3	10.0	78.37
▪ Done	0	0.0	30	100.0	27	90.0	0.00*
12. Provide health education about control of blood sugar. Diet, exercises and medications							
▪ Not done	30	100.0	0	0.0	3	10.0	78.37
▪ Done	0	0.0	30	100.0	27	90.0	0.00*

\* Significant at level P < 0.05.

**Table (5):** Distribution of client and family teaching items among the studied nurses throughout periods of study. There are highly significant differences regarding the nurses' education to the clients and their family about items of (ways of instilling eye drops, proper using of eye patch, avoiding constipation or straining, reporting eye pain photophobia, hemorrhage, Flashes of light, floaters, controlling blood glucose, diet exercises and medications after discharge.)

**Table (6):** Distribution of total practice level about retinopathy for diabetic among the studied nurses throughout periods of study

Total Practice Level	The studied nurses (n=30)						$\chi^2$ P
	Pre		Immediate		Post 2 months		
	N	%	N	%	N	%	
▪ Poor	30	0.0	0	0.0	3	10.0	78.37
▪ Good	0	100.0	30	100.0	27	90.0	0.00*
<b>Range</b>	<b>(9-13)</b>		<b>(43-43)</b>		<b>(0-43)</b>		<b>F=143.95</b>
<b>Mean ± SD</b>	<b>12.13±1.613</b>		<b>43.00±0.00</b>		<b>38.70±13.121</b>		<b>P=0.00*</b>

\* Significant at level P < 0.05.

**Table (6):** Distribution of total practice level about retinopathy for diabetic among the studied nurses throughout periods of study. There are significant differences in relation to nurses' total practice level among preoperative immediate postoperative and after two months postoperatively, with mean ± SD = 12.13±1.613, 43.00±0.00, 38.70±13.121 respectively.

### 3. DISSCUSSION

Diabetic retinopathy was detected in 1.78% of the patients screened and was projected to become a significant cause of blindness in the coming decade. This blindness usually results from non-resolving vitreous hemorrhage, fractional retinal detachment, and diabetic macular edema. The Diabetic Retinopathy Study (DRS), the Early Treatment Diabetic Retinopathy Study (ETDRS) and the Diabetic Vitrectomy Study (DRVS), developed highly specific recommendations for the appropriate management of DR. <sup>(18)</sup>

The Early Treatment for Diabetic Retinopathy Study has found that laser surgery for macular edema reduces the incidence of moderate visual loss (doubling of visual angle or roughly a 2-line visual loss) from 30% to 15% over a 3-year period.<sup>(19)</sup> All nurses, whether in primary or secondary care, have a major role to play to help reduce the incidence of DR by educating and empowering patients to maintain their blood-glucose control, and encouraging them to attend for regular eye examinations. So the aim of the study to evaluate the effect of implementing of health education program for nurses about the care of diabetic retinopathy patient with Laser Photocoagulation surgeries.

Regarding the socio-demographic characteristics, the current study included 30 nurses. About two-thirds of them were aged less than 40 years. Also, about half of the studied nurses had a technical education. This result showed that the nursing staff who provided caring to diabetic retinopathy patients with laser photocoagulation surgery which is a serious

field had a very little experience and poor knowledge, that may be causing serious complications. It was important that appropriate training in the management of diabetic retinopathy patients with laser photocoagulation surgery should be given to the nurses to ensure that patients are cared for safely and competently.

According to their years of experience, it was found that all of the nurses had experienced more than 10 years, but they didn't have previous training courses in the care of diabetic retinopathy patients in ophthalmology department. This is in an agreement with **Hinkle et al., (2014)**<sup>(19)</sup>, who's studied the need for the nurses to have an in-service education, In the same line study had done by **Salem, (2005)**<sup>(21)</sup>, who found in her study in Zagazig University about "Assessment of Intensive Care Units Nurses Knowledge and Practice of Infection Precautions" that there was a positive correlation between nurses' practice and their age, also this correlation not statistically significant. This has explained as senior nurses who have prolonged years of experience took administration role and delegates the nursing activities to the junior nurse, they were away from the practise field, and consequence their mastering skills were decreased.

The results showed there are highly significant differences regarding knowledge of the nurses before, immediate and two months after implementing of an educational program for the nurses about items of (definition, signs and symptoms, risk factors, options of treatment, the role of nurse and health education for the diabetic retinopathy patients). This finding is in agreement with **Taha et.al, (2015)**<sup>(22)</sup>, and **Belal, (2004)**<sup>(23)</sup> who reported that nurses' knowledge of the anatomy and physiology of the eye was unsatisfactory.

The implementation of the teaching program led to significant improvements in the nurses' knowledge. This result was supported by **Lewis et.al., (2011)**<sup>(24)</sup>, who reported that it is necessary for the ophthalmic nurse to have a detailed knowledge of structure and function of the eye. The enhancement in nurses' knowledge score due to the active involvement of nurses in session and frequent review of knowledge and nurses in the present study were interested in education and have an active role during the implementation program. This result was in line with **Panigrahi S.et al., (2017)**<sup>(25)</sup>, who mentioned that only 48 (17.6%) students were of the view that laser and intravitreal injections could restore vision in most of the cases and very small number 36 (13.2%) students knew that few cases need vitrectomy to restore vision. When asked about whether diabetic retinopathy patients need regular follow up even after treatment, to maintain and prevent further deterioration of vision.

There are highly significant differences regarding the preoperative nursing care practice of the nurses before, immediate and two months after the implementing of an educational program about items of (assessment of visual acuity, administering medications and eye drops, having glasses available, and instructing the patients about avoidance of activity that providing intraocular pressure). This finding agrees with **Mohamed, (2008)**<sup>(26)</sup>, revealed deficient practice among ophthalmic nurses in the study at Ain-Shams University Hospitals, particularly regarding the provision of unplanned incomplete verbal instructions to patients at discharge This finding explained that nurses did not know the effect of discharge instructions in improving patients conduction. In addition absence of training programs and booklets inside the ophthalmic department.

Also the study showed there are highly significant differences regarding the postoperative nursing care practice of the nurses about items of (maintain of the eye patch in place, placing patient in fowler's position, giving antiemetic medication reporting any sudden complaint and reporting eyes pain, photophobia, flashes of light, floaters, Hemorrhage with blood in the anterior chamber of the eye). The implementation of the teaching program led to significant improvements in nurses' practices. This may go back to several reasons, such as helping the nurse to remember how to care for eye and administering of the eye medication by giving them the colored booklet; better communication with them and explaining how to perform eye care and how to instill eyedrops. And frequent demonstration. This is supported by **Jensen et.al., (2015)**<sup>(27)</sup>, **Nettina et.al, (2014)**<sup>(28)</sup>, **Taylor et.al, (2015)**<sup>(29)</sup>, who stated understanding of the technique of the eye care as hand washing before and after touching the eye, prepare equipment, wear gloves, assume comfortable position, position the light source to allow maximum observation of patient, place disposable towel around the patient, moisten cotton swab in prescribed solution, clean postoperative eye with a clean tissue, wipe the closed eye with a single gesture from the inner canthus outward, clean your eyelid edges at least twice a day with a moist clean face cloth while avoiding pressure on the upper eyelid, dry patient eyelids, close the eye with tape, dispose the equipment safely, wash hands after contact, monitor & report any abnormal finding.

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There are highly significant differences regarding the nurses' education to the clients and their family caregiver about the items of (ways of instilling eye drops, proper using of eye patch, avoiding constipation or straining, reporting eye pain photophobia, hemorrhage, Flashes of light, floaters and controlling blood glucose, diet exercises and medications after discharge) This result was supported by **Kearney et. al., (2006)**<sup>(30)</sup>, recommended that nurses need to be aware of eye disease and conditions in older adults which should be standardized within their work environment through the use of protocols to ensure safety and therapeutic outcomes. This may be due to the nurses must be knowledgeable and be aware of the warning symptoms that causes complication after the surgery. The enhancement in nurses' knowledge score due to content of program based on nurses' needs, its clarity and simplicity, using of audiovisual aids and the availability of teacher in the field for more clarification, and frequent repetition to fix the knowledge.

**4. CONCLUSION**

Laser photocoagulation surgery results need a multidisciplinary effort which includes perfect surgery, a good nursing care and finally awareness of patients and their family caregiver by postoperative precaution to be followed. It can be concluded that the teaching program significantly improves nurses' knowledge and practices about Laser Photocoagulation surgery for diabetic retinopathy patients with a sustained improvement in clinical outcomes and reduce complications.

**5. RECOMMENDATIONS**

- Training of the nursing staff and the community health nurses in screening patients of diabetes and referral to ophthalmology centers, registration of diabetes societies and helping awareness in diabetes patients,
- Conducting or facilitating training or continuing medical education to the community workers and paramedical staff, should be emphasized to decrease the disease morbidity and blindness associated with diabetes.
- Proper emphasis on the knowledge, and practices of the nursing staff can bridge the gap between the ophthalmologists and the patients.
- Every opportunity of contact with the high-risk cases for DR at any health service facility should be utilized to identify patients of diabetic retinopathy. Nursing staff have a significant contact time with the patient and due to their constant support can be a good motivational force to the patient.

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