

# Educational Nursing Intervention: Its Effect on the Nurses' Performance, Patients' Daily Living Activities, Needs and Selected Visual Problems of Cataract Surgery

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## Abstract

Cataract is the second cause of visual impairment and the first cause of blindness globally so inadequate nursing intervention lead to serious complications for the patient with cataract surgery. **Purpose of the study:** to evaluate the effect of educational nursing intervention on the nurses' performance, patients' daily living activities, needs and selected visual problems of cataract surgery. **Setting:** The current study was carried out at ophthalmology department and out patients' ophthalmology clinic in Menoufia university hospital and El Ramad hospital in Shebin El-Kom district, Menoufia governorate, Egypt. **Subjects:** A purposive sample of adult 25 nurses and 100 patients was divided into two equal groups (study and control). **Tools of the study:** Three tools for data collection; two tools for nurses (a self-administered questionnaire (tool I) and an observation checklist for nurses' performance (tool II) and one tool for patients (an interview questionnaire, tool III). **Results:** There was a highly statistically significant improvement in total mean score of nurses' knowledge from  $27.56 \pm 3.11$  pre intervention to  $41.08 \pm 4.09$  post intervention and after one week to  $38.0 \pm 3.69$  as a follow up. Also, there was a highly statistically significant improvement in the total nurse's performance mean score from  $102.84 \pm 21.54$  pre intervention to  $245.44 \pm 22.84$  post intervention and after one week to  $239.84 \pm 23.05$  as a follow up  $p < 0.001$ . Also, there were highly statistically significant improvements in meeting all patients' daily living activities and needs with minimized visual complications after intervention ( $p < 0.001$ ). **Conclusions:** Total good level of knowledge, satisfactory performance of the studied nurses significantly improved after implementing educational nursing intervention with better achievement of patients' daily living activities and needs with major limitation in visual problems.

**Keywords:** cataract, nursing intervention, daily living activity, visual problems.

## Introduction

Eye problems affect everyone at some point in lives, eye disorders become a part of everyday lives. There are different conditions that affect the eye, some are minor and resolve quickly but others are serious and lead to serious visual impairment. Patients with eye disease have the greatest fear for becoming blind. While there are a number of eye diseases that can lead to some form of vision impairment, i.e. less than normal vision), eye problems can affect different aspects of vision and patients can often adapt by using the remaining vision. The most common eye problems are color blindness, macular degeneration, glaucoma, astigmatism, strabismus, cataracts, myopia, low vision,

blindness, optic nerve disorders, retinal disorders, macular degeneration, diabetic eye problems, conjunctivitis and eye infection (Kumar, 2018; and Dunaief, 2018).

Cataracts are one of serious eye problems, it is a global problem and is the most principal cause of blindness in people worldwide. In fact, there are more cases of cataracts worldwide than other eye diseases as glaucoma, macular degeneration and diabetic retinopathy. Cataract accounting for approximately 42% of all cases of blindness in all nations. It is occurring in individuals aged 40 and older. If left untreated, cataract can eventually progress to severe visual impairment or even blindness. Cataract affects 24 million Americans age 50 and older (Bailey and Thompson, 2016; Royal national institute of blind people, 2019).

Cataracts can interfere with daily activities and lead to blindness when left untreated. The surgical removal of cataracts is a very common procedure and is highly effective procedure today (National Eye Institute, 2019).

Surgery is the only way to cure from cataract. The cataract surgery is one of the safest and successful surgical procedures performed today, more than 95% of surgeries are successful with fewer than 5% of cases experiencing complications such as inflammation, bleeding, infection and retinal detachment (Royal national institute of blind people, 2019).

There are potential postoperative complications that are divided into early complication of cataract within 24 hrs. after surgery as anterior chamber collapse, corneal edema, keratitis, raise intra ocular pressure, wound leakage, postoperative pain and inflammation. Late complication after 24 hrs. of surgery as endophthalmitis, decrease vision with red eye due to loose suture, rebound uveitis, chronic irritable eye, decrease vision without red eye include change in refraction, intra ocular lenses dislocation, cystoid macular edema, change in refraction (astigmatism), posterior capsule opacification, retinal detachment, vitreous detachment and persistent corneal edema (Kumar and Pratap, 2018).

Prevention of cataract is a very important and vital role of the ophthalmic nurse to reduce the risk of developing cataract through educate the patients to protect eyes from ultraviolet rays by wearing sunglasses outside, have regular eye exams, stop smoking, eat fruits and vegetables that contain antioxidants, maintain a healthy weight, keep diabetes and other medical conditions in check regularly (Jacobs, 2016).

Nursing intervention for cataract surgery starts from the preoperative period and extends to the postoperative period as well as discharge instructions. The nurses should assess the patient's preoperative basic needs and assist to meet these needs. Preoperative intervention has proven beneficial in decreasing postoperative complications and length of stay as well as positively influencing recovery (Rabinovitach, 2017).

Finally, American College of Eye Surgeons, (2019) stated that educational nursing interventions is effective methods to enhance the clinical outcomes of the patient with cataract, improve the quality of life and assist the patient to meet needs and perform daily living activities effectively.

### Significance of the study

World Health Organization, (2018) stated that cataract is the major cause of blindness of the population and is the most common cause of vision loss globally. Cataracts affect millions of people worldwide.

The incidence of 400,000 new cases of cataract occurs each year in the United States of America. The risk of incidence increases with age, about 20 out of 100 people between the ages of 45 and 65 have a cataract as well as cataract is considered as a local problem (American academy association of ophthalmology, 2015; Khairallah, Kahloun and Bourne, 2015),

In Egypt, Country statistical profiles, (2016) stated that the prevalence of low vision for all ages is about 47.9% of the population and also according to Hegazy, Ragheb, Elsayed and Rashad, (2012) who mentioned that the percentage associated with cataract is about 54.8% which consider the major cause of blindness. While in Shibin El Kom Hospitals of Ophthalmology, about 3000 surgeries are conducted to remove white water for patients with cataract surgery in El Ramad Hospital ( Statistical record of El-Ramad hospital, 2018) and about 1200 cases are annually subjected for cataract related surgery at ophthalmology department in Shebin El-Kom Menoufia University Hospital (Statistical record of Menoufia University Hospital of Ophthalmology, 2018).

Cataracts have a significant negative impact on person's functional abilities and emotional wellbeing and correlated with depression and blindness that affects patients' independence in self-care and performance of the activities of daily living, in the form of decreased quality of life and productivity for the blind (Thomas, Sanders and Oliva, 2017).

Nurses have a major role in all aspects of cataract surgery and meeting patient daily

living activities and needs through effective nursing interventions. A pertinent nursing care intervention would help the nurses in ophthalmology departments (Taha and Abd Elaziz, 2018).

Moreover, American College of Eye Surgeons, (2019), showed that the benefits of implementing educational nursing intervention when providing care of cataract patients that induce improvements in nurses' related performance, with better achievement of patients' needs enhancing the quality, safety, effectiveness and availability of the care for the patient with cataract and decreasing the incidence of visual problems after cataract surgery. So, the current study was conducted to improve the nurses' performance, meet patients' daily living activities and needs, help the nurses picking up as early as possible to prevent or delay the occurrence of visual problems or complications and promptly manage any problem occur to patients undergoing cataract surgery.

### Purpose of the Study

The purpose of the current study was to evaluate effect of educational nursing intervention on the nurses' performance, patients' daily living activities, needs and selected visual problems of cataract surgery. Throughout achieving the following:

- Gaining a higher level of knowledge and performance for the studied nurses,
- Meeting patient's daily living activities and needs as well as minimizing patient's visual problems.

### Research Hypotheses

The following research hypotheses were formulated in an attempt to achieve the purpose of the study:

- Nurses who receive the educational nursing intervention have a higher level of knowledge than pre intervention.
- Nurses who receive the educational nursing intervention have a higher level of a performance than pre intervention.
- Patients' daily living activities and needs are mostly met post the educational nursing intervention as compared with pre intervention.

- The patient's visual problems are lower post the educational nursing intervention than pre intervention.

## Subjects & Methods

### Research Design:

A quasi experimental research design was utilized to achieve the purpose of the current study.

### Research Setting:

The current study was carried out at ophthalmology department and out patients' ophthalmology clinic in Menoufia University Hospital and El Ramad Hospital in Shebin El-Kom, Menoufia Governorate, Egypt.

### Subjects:

#### ▪ Sample type:

A purposive sample of nurses and patients was selected for the current study, as a type of non- probability or non-random sampling selected based on characteristics of a population and the objective of the study that met certain practical criteria, such as easy accessibility, geographical proximity, availability at a given time, or the willingness to participate included for the purpose of the study (Crossman, 2017).

#### ▪ Sample size:

According to available number of nurses at ophthalmology department and out patients' ophthalmology clinic in Menoufia University Hospital and El Ramad Hospital in Shebin El-Kom, according to inclusion and exclusion criteria is 25 and tolerance of each nurse to give care for 4 patients so total number of patients is 100 patients.

### Samples:

They were divided alternatively into two sample groups:

- A group of 25 nurses was examined three times (pre intervention, immediately post intervention and one week as a follow up after implementing the educational nursing intervention).
- Patients was divided into two equal groups; 50 for each group:

- **Control group (I)** of 50 patients who were received routine nursing care (pre and post-operative nursing care) and was examined three times (one day, one week and one month) post- operatively.
- **Study group (II)** of 50 patients who were recieved routine nursing care and educational nursing intervention, examined three times (one day, one week and one month) post-operatively after implementing the intervention for the nurses.

#### Inclusion criteria for nurses

- Clinical experiences in ophthalmology department more than 3 years.
- Willing to practice, communicated and co-operative nurses.
- High and diploma qualified nurses.
- A direct contact bed side nurses with patients were had cataract.

#### Exclusion criteria for nurses

- Head nurses who were managers or supervisors.

#### Inclusion criteria for patients

- Adult and conscious patients with age ranged from 19 to 60 years.
- Patient undergoing cataract surgery.
- Patients with controlled diabetes (patients with overall good control of blood sugar level and decreased incidence of diabetic manifestation and complications).

#### Exclusion criteria for patients

- Patient with mental disabilities.
- Patient who cannot communicate.
- Patient with previous eye complications as inflammation, light sensitivity, photopsia (perceived flashes of light) and macular edema.

#### Tools:

Three tools were carried out for data collection of the current study (tool I & tool II) for nurses and (tool III) for patients.

#### Tool I: a self-administered questionnaire:

This tool was developed by the researchers to assess demographic and knowledge of the nurses. It was written in English and was comprised of two parts:

**Part 1: demographic characteristics of the nurse:** it was used to collect data about the following: age, gender, marital status, educational level, years of clinical experiences and training courses in ophthalmology, etc.

**Part 2: knowledge assessment:** it included questions to assess nurse's knowledge before and after implementation of educational nursing intervention as the following: -

- Anatomy and physiology of the eye (9 questions) such as eye layers, orbit, cornea, crystalline lens.
- Cataract disease (10 questions) such as definition, causes, risk factors, types, signs & symptoms, diagnosis, prevention, in addition to cataract surgery; indications, most common techniques, complications and nursing management.
- Nursing intervention before and after cataract surgery (6 questions) such as proper position after surgery, nurse role for relieving postoperative pain, prevention of infection, signs & symptoms of infected eye and postoperative ophthalmic complications.
- Discharge instructions for patients and their families (6 questions) regarding the use of eye drops & ointment, wearing eye shield and protection of the eye, precautions to prevent infection, food regimen to reduce straining and constipation, exercise and avoiding heavy lifting, unusual symptoms and follow up.

#### Scoring system:

Nurse's knowledge was clarified on a 3-point scale consisting of complete correct answer, incomplete correct answer and incorrect answer or don't know. Each item given score of two marks for complete correct answer, one mark for incomplete correct

answer and zero mark for incorrect answer or don't know. The total score ranged from zero to 62. The higher score, the higher knowledge level & vice versa.

#### **The total score of knowledge:**

Was categorized according to (Yusof, Chia and Hasni, 2014) as:

- A score from zero to 31 marks represent from 0% to 50% denoted poor level of knowledge.
- A score from more than 31 to 43.5 marks represent more than 50% to 70% denoted fair level of knowledge.
- A score more than 43.5 marks represent more than 70% denoted good level of knowledge.

#### **Tool II: Observation checklist:**

This tool was developed by Mecann and Judith (2009) and adapted by the researchers to examine nurse's performance for the care provided to patients after cataract surgery because the patient admitted at the day of surgery and perform preoperative care at home. The hospitalized general preoperative care to the patient as (controlled blood sugar, measured blood pressure and general hygiene). More over the researcher observed nurse's performance (away from visits and rounds) while instilling eye drops, it was adapted from American Society of Health, (2013) and consisted of 15 items, applying ointment, it was adapted from American Society of Health, (2013) and consisted of 12 items, changing eye dressing, it was adapted from Stevens, (2016) and consisted of 10 items, performing eye care with maintaining infection control, it was adapted from American Society of Health, (2013) and consisted of 13 items and using non-pharmacological methods to reduce pain such as relaxation massage, it was adapted from Biswas and Radhakrishnan, (2018) and consisted of 7 items, tense & relax exercise, it was adapted from Biswas and Radhakrishnan, (2018) and consisted of 71 items and deep breathing exercise, it was adapted from Bolen, (2018) and consisted of 7 items.

**Scoring system:** Nurse's performance was clarified on a 3-point scale, two marks for correctly complete done, one mark for correctly

incomplete done and zero mark for incorrectly done or not done. The total score ranged from zero to 270. The higher score represents the higher nurses' performances level & vice versa.

**The total score of nurses' performances:** was categorized as:

- A score from zero to 135 marks represent from 0% to 50% denoted unsatisfactory performance level.
- A score from more than 135 to 189 marks represent more than 50% to 70% denoted partial satisfactory performance level.
- A score more than 189 marks represent more than 70% denoted satisfactory performance level.

#### **Tool III: Patient's Interviewing Questionnaire for the patients:**

This tool was developed by researchers based on the literature review (Belal , Ibrahim, El Senosy and Hegazy, 2004; El Shafaey and Basal, 2018; El-Shamy, Shabaan and El- Banna, 2018; Mayo Foundation for Medical Education and Research, 2019 & Taha and Abd Elaziz, 2018) to assess patients' daily living activities and selected visual problems within (one day, one week and one month) after surgery.

It was divided into three parts as the following:

**Part 1: patients' socio demographic data** such as age, sex, marital status, occupation, level of education, and monthly income.

**Part 2: patients' daily living activities and needs** to assess meeting of patients' daily living activities and needs, (41 question) with total score 82 marks such as:

**A) Physical needs**, (23 questions) with score 46 marks including:

- 1) **Nutrition needs**, (6 questions) with score 12 marks, including time for eating and drinking, following appropriate food regimen, provision of adequate nutrition, and fast food.
- 2) **Sleep and rest in hospital** (5 questions) with score 10 marks, including quiet room with good sanitation and clean environment, relieving pain and comfort after pain relief.

3) **Activities of daily living**, (7 questions) with score 14 marks, including time for performing activities such as rate of movement, watching TV, driving, exposure to sun and maximum weight for lifting), activity limitation in the first week (shaving chin, self-bathing, combing hair and bending down).

4) **Pharmacological management**, (5 questions), with score 10 marks, including follow prescribed medication, eye dressing change and precautions of drug side effects.

**B) Psychological domains**, (4 questions) with score 8 marks, including proper dealing with health team, response of nurse to patient requests, answering patient's questions and feeling of safety and security.

**C) Pre-discharge instructions**, (14 questions) with score 28 marks, including follow-up visits schedule, unusual signs & symptoms, sleep position, food regimen, medications, eye care and permissible activities.

#### Scoring system:

Patients' daily living activities and needs were clarified on a 3-point scale consisting of completely achieved, incompletely achieved and not achieved. Score of 2, 1 and zero were assigned for the previous points respectively. The total score ranged from zero to 82. The higher score, the higher level of needs achievement & vice versa.

**The total score of patients' needs:** was categorized as:

- A score from zero to 41 marks representing from 0% to 50% denoted poor daily living activities and needs achievement.
- A score from more than 41 to 57.5 marks representing more than 50% to 70% denoted fair daily living activities and needs achievement.
- A score more than 57.5 marks representing more than 70% denoted daily living activities and good needs achievement.

**Part 3: patient's selected visual problems**, it was assessed patient's selected visual problems after cataract surgery (22

questions) with total score 44 marks, through questions such as sudden or severe pain, persistent headache, redness, eye discharge, blurring vision, as well as difficulty to see TV, problems with driving, difficulty recognizing faces, eye inflammation, light sensitivity, photopsia (perceived flashes of light), macular edema (swelling of the central retina), and ocular hypertension.

#### Scoring system:

Patient's selected visual problems were classified as completely have, incompletely have and don't have. Each item given a score of 2 marks for completely have, one mark for slightly have and zero mark for don't have. The total score ranged from zero to 44. The higher score, the higher level of visual problems & vice versa.

The total score of selected visual problems were categorized as:

- A score from zero to 22 marks representing from 0% to 50% denoted good surgical outcomes.
- A score from more than 22 to 31 marks representing more than 50% to 70% denoted fair surgical outcomes.
- A score more than 31 marks representing more than 70% denoted poor surgical outcomes.

#### Methods

- **Written approval:** Permission to carry out the study was taken from responsible authorities from Faculty of Nursing, Menoufia University and directors of University Hospital and El- Ramad Hospital after explanation of the purpose of the study.
- **Validity of the tools:** All tools of the study were developed by the researchers except tool II developed by (Mecann and Judith, 2009) and adapted by researchers. They were tested for content validity by five experts 4 in the field of medical surgical nursing, Faculty of Nursing, Menoufia University and one ophthalmologist from Faculty of Medicine, Menoufia University and modifications were done to ascertain relevance and completeness.

- **Reliability of the tools:** All tools were tested using a test retest method and a person correlation coefficient formula was used. Internal consistency was evaluated using Cronbach's alpha for all tools. It was 0.85 alpha for tool I, 0.81alpha for tool II, 0.80 alpha for part I from tool III and 0.83 alpha for part II from tool III.
- **Ethical consideration:** The nurses' and patients' verbal and written consent for participation in the study was obtained after explanation of the purpose of study, confidentiality and privacy were maintained such as participation in the study was entirely voluntary.
- **Pilot study:** A Pilot study was carried out prior to data collection on 10% of the subjects (3 nurses and 10 patients) to examine the tentative developed tools for testing feasibility, applicability and practicability of the tools. Then, necessary modifications were carried out. The sample of the pilot study were excluded.

#### Data Collection process:

- Data collection were collected over a period of 6 months extended from the beginning of July 2019 to the end of December 2019.
- The study was using four consecutive steps:

#### Step one:

After developing of the tools and getting the official permission. The researcher started to collect the data according to the inclusion criteria and agreed to participate in the study. The nurses' knowledge was assessed using tool I, the self-administered questionnaire with in 10 minutes, followed by observing their performance with cataract patients in different shifts using tool II the observation checklist after that the patients' daily living activities and needs and selected visual problems were assessed using tool III with in 20 minutes.

#### Step two:

Based on analysis of the collected data and using pertinent literature, the researcher developed educational nursing interventions for nurses to care of cataract patients after surgery. It covered knowledge regarding

cataract, cataract surgery, and nursing care of patients before and after cataract surgery, pre-discharge instructions for patients & their families and follow-up for postoperative cataract patients. The practical part covered training on the skills of instilling eye drops, ointment application, changing eye dressing, performing eye care and infection control, practice of measures for relieving postoperative cataract pain, using non-pharmacological methods to reduce postoperative cataract pain in addition to psychological support and reassurance.

#### Step three:

- Nurses were divided into 5 groups. Each group contained 5 nurses were taught at the rest time from 12.30 pm. Each group received 3 theoretical sessions and 2 practical sessions. Each session ranged between 45 to 60 minutes.
- The teaching methods involved lectures, group discussions as well as demonstration and return demonstration (for practical parts). The utilized teaching media included illustrative pictures, videotapes and handouts.

**A) Theoretical sessions:** - it was included 3 sessions as follows:

- 1) **The first teaching session:** basic knowledge regarding anatomy, physiology of eye in addition to cataract disease, definition, causes, risk factors, types, signs & symptoms, diagnosis and prevention.
- 2) **The second teaching session:** knowledge regarding cataract surgery indications, most common techniques, complications, nursing intervention before cataract surgery such as assessment of the visual acuity before surgery, activities which may increase intraocular pressure as (coughing, lifting heavy objectives, bending over at the waist) and after cataract surgery such as proper position after surgery, nurse role for relieving postoperative pain, prevention of infection, signs & symptoms on infected eye, proper diet to help healing and postoperative complications.
- 3) **The third teaching session:** knowledge regarding predischage instruction for

patient and their families regarding instilling eye drops and ointment, wearing eye shield, protection of the eye, precautions to prevent infection, food regimen to reduce straining and constipation, exercise, avoiding heavy lifting and unusual symptoms, follow-up.

**B) Practical sessions:** it was included 2 sessions as follows:

- 1) **The first practical session:** included performance regarding demonstration and return demonstration of instilling eye drops, applying ointment, changing eye dressing and performing eye care with maintaining infection control.
- 2) **The second practical session:** included practice regarding demonstration and return demonstration of measures for relieving postoperative pain using non-pharmacological methods such as relaxation massage, tense & relax exercise and deep breathing exercise.

#### The last step:

The evaluation of educational nursing intervention effects on nurses' knowledge, performance and on patients' daily living activities & needs was carried out by using the same assessment data collections tools.

- For nurses, each nurse was evaluated three times, before implementing educational nursing intervention, immediately after intervention and one week after the interventions as a follow-up.
- For patients, each patient was evaluated three times,
  - Control group was evaluated on one day, one week and one month with routine hospital care.
  - Study group was evaluated on one day, one week and one-month post implementing educational nursing interventions, daily living activities and needs achievement were evaluated at the outpatients' ophthalmic clinic during a follow-up visits in both groups.

#### Statistical analysis:

Results were statistically analyzed by SPSS version 22 (SPSS Inc., Chikago, IL, USA).

#### Two types of statistics were done:

1) **Descriptive statistics:** were expressed as mean and standard deviation ( $\bar{X} \pm SD$ ) for quantitative data or number and percentage (No & %) for qualitative data.

#### 2) Analytic statistics:

- **F-test:** is any statistical test in which the test statistic has an F-distribution under the null hypothesis. It was most often used when comparing statistical models that have been fitted to a data set.
- **Post hoc test:** it was used to detect the individual significance between groups.
- **Chi-Square ( $\chi^2$ ):** it was used to compare between two groups or more regarding one qualitative variable.

#### P-value at 0.05 was used to determine significance regarding:

- Non statistically significant difference if p-value  $> 0.05$ .
- Statistically significant difference if p-value  $< 0.05$ .
- Highly statistically significant P-value difference  $< 0.001$ .

#### Results

**Table 1:** showed demographic characteristics of the studied nurses. It was revealed that all nurses in the study sample were married females, with age ranging between 26 to 56 years. Regarding to educational level, it was observed that about 64% had bachelor education and 36% had diploma. As regard clinical years of experiences; all nurses experienced more than 3 years clinically in ophthalmic department, it was observed that about 40% of studied nurses had 3-5 years of experience, 24% had more than 5 years and less than 10 years and about 36% had more than 10 years of ophthalmology clinical experiences. As regard training courses; only 44% of the studied nurses attended training courses in ophthalmology.

**Table 2:** revealed that the mean age for the study group was  $57.70 \pm 7.55$  years, while for control group was  $56.82 \pm 7.09$  years. 82% and 68% respectively of groups were males.



76% and 62% respectively lived in rural areas and married (60% and 58% respectively). Regarding educational level; it was observed that more than half of study group (54%) had basic education and more than third of control group (40%) had basic education. As regard occupation, 38% of study group had administrative work and 36% were hand workers but in control group about 36% had administrative work and 38% were house wives. Additionally, as regard to income, 94% and 82% respectively of the both groups had not enough income. There were no statistically significant differences between patients' study and control groups related to patient's demographic characteristics  $p > 0.05$ .

**Table 3:** showed that there was a highly statistically significant improvement in mean scores total nurses' knowledge concerning caring of patients undergoing cataract surgery  $27.56 \pm 3.11$  pre intervention to  $41.08 \pm 4.09$  post - intervention and to  $38.0 \pm 3.69$  one week after intervention as a follow up when compared with pre-intervention. There was highly statistically significant difference regarding nurses' knowledge related to eye anatomy, cataract disease, nursing role and pre discharge instructions of cataract surgery pre-intervention, post- intervention and follow up with P value  $< 0.001$ .

**Table 4:** it was cleared that there was a highly statistically significant improvement in mean total nurses' performance related to caring of patients undergoing cataract surgery  $102.84 \pm 21.54$  pre intervention to  $245.44 \pm 22.84$  post intervention and to  $239.84 \pm 23.05$  after one week of intervention as a follow up when compared with pre intervention. There was a very highly statistically significant difference in nurses performance about instilling eye drops total score, applying ointment score, changing eye dressing score, eye care & infection control score and non-pharmacological methods for pain control score pre- intervention, post- intervention and follow up with P value  $< 0.001$ .

**Figure 1:** illustrated that the majority of nurses had an improvement in the total level of nurses' performance in post and follow up where as 92% of nurses had unsatisfactory

level of performance pre- intervention that changed to 92% had a satisfactory level of performance post – intervention, also after one week of intervention as a follow up about 92% had a satisfactory level of performance and about 8% had a partial satisfactory level of performance.

**Figure 2:** showed that there was improvement in total score of meeting daily living activities and needs after surgery for patients 100% of both groups (control & study) had a poor achievement of daily living activities and needs on one day post- operative, while after one week, 84% of the study group had a good achievement in contrast with control group; all group had a poor achievement (100%) and also after one month (84%) of the study group had a good achievement but all control group had a poor achievement (100%) and also showed that there was improvement in daily living activities and needs achievement in the study group as compared with control group.

**Table 5:** showed that decrease in the total mean score of visual problems between control and study groups were  $38.08 \pm 1.56$  for control group and  $37.86 \pm 2.73$  for the study group after one day but there were decrease in visual problems after one week that reached to  $26.56 \pm 4.51$  for the study group and after one month post -operative as a follow up to  $23.94 \pm 2.90$ . There was highly statistically significant difference related to decrease visual problems in one-week post and one month as a follow up post nursing intervention between the control and study groups with P value  $< 0.001$ .

**Figure 3:** showed that the majority of the study group on one day post- operative had maximized visual problems (96%) and also all control group had maximized visual problems (100%), while on one week post-operative about 72% of the study group had a fair level of visual problems in contrast with control group all patients had maximized visual problems (100%), while after one month about (82%) of the study patients had minimized visual problems but all control patients had maximized visual problems.

**Table (1):** Frequency and percentage distribution of general characteristics of the studied nurses' group.

Items	(No. = 25)	%
<b>Age (Y)</b>		
Mean $\pm$ SD	36.8 $\pm$ 8.94	
Range	26-56	
<b>Level of education</b>		
Diploma	9	36.0
Bachelor	16	64.0
<b>Training courses</b>		
Yes	11	44.0
No	14	56.0
<b>Gender</b>		
Male	0	0
Female	25	100.0
<b>Marital status</b>		
Married	25	100.0
<b>Clinical years of experiences</b>		
3-5 years	10	40.0
>5-10 years	6	24.0
>10 years	9	36.0

N.B: All nurses were married females

**Table (2):** Frequency and percentage distribution of patients' demographic characteristics in both groups.

Items	Control group (n=50)		Study group (n=50)		Test	P value
	No	%	No	%		
<b>Age (Y)</b>						
Mean $\pm$ SD	56.82 $\pm$ 7.09		57.70 $\pm$ 7.55		T =0.60	0.550
<b>Sex</b>						
Male	34	68.0	41	82.0	$\chi^2=2.61$	0.106
Female	16	32.0	9	18.0		
<b>Residence</b>						
Rural	31	62.0	38	76.0	$\chi^2=2.29$	0.130
Urban	19	38.0	12	24.0		
<b>Marital status</b>						
Single	21	42.0	20	40.0	$\chi^2=0.04$	0.839
Married	29	58.0	30	60.0		
<b>Level of education</b>						
Illiterate	5	10.0	5	10.0	$\chi^2=5.10$	0.078
Basic	20	40.0	26	52.0		
Diploma	21	42.0	11	22.0		
High	4	8.0	8	16.0		
<b>Occupation</b>						
Hand worker	11	22.0	18	36.0	$\chi^2=4.71$	0.194
Administrative work	18	36.0	19	38.0		
Not working	2	4.0	3	6.0		
Housewife	19	38.0	10	20.0		
<b>Income</b>						
Enough	9	18.0	3	6.0	$\chi^2=3.40$	0.065
Not enough	41	82.0	47	94.0		

**Table (3):** Mean scores and distribution of knowledge assessment of the studied nurses' group.

Items	Nursing intervention			F test (P value)	Post hoc test
	Pre (No.=25)	Post (No.=25)	Follow-up (No.=25)		
	Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD		
Eye anatomy score	8.64 $\pm$ 1.57	14.68 $\pm$ 1.97	13.92 $\pm$ 1.52	167.53 (P<0.001*)	P <sub>1,2</sub> <0.001* P <sub>3</sub> =0.178
Cataract disease score	11.72 $\pm$ 1.33	16.12 $\pm$ 1.78	14.60 $\pm$ 2.19	119.160 (P<0.001*)	P <sub>1,2,3</sub> <0.001*
Nursing role score	3.24 $\pm$ 0.72	5.08 $\pm$ 0.70	4.56 $\pm$ 1.08	75.25 (P<0.001*)	P <sub>1,3</sub> <0.001* P <sub>2</sub> =0.019*
Pre discharge instruction score	3.96 $\pm$ 0.84	5.20 $\pm$ 0.64	4.92 $\pm$ 0.90	21.57 (P<0.001*)	P <sub>1,2</sub> <0.001* P <sub>3</sub> =0.498
Total knowledge score	27.56 $\pm$ 3.11	41.08 $\pm$ 4.09	38.0 $\pm$ 3.69	301.15 (P<0.001*)	P <sub>1,2,3</sub> <0.001*

F test: Repeated measures ANOVA; \*: significant; P<sub>1</sub>: Pre vs. Post, P<sub>2</sub>: Pre vs. Follow-up, P<sub>3</sub>: Post vs. Follow-up

**Table (4):** Comparison of nurses' practice pre, post and follow up nursing intervention among studied nurses.

Items	Nursing intervention			F test (P value)	Post hoc test
	Pre (No.=25)	Post (No.=25)	Follow-up (No.=25)		
	Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD		
Instilling eye drops total score	20.80 $\pm$ 4.59	27.80 $\pm$ 2.14	26.92 $\pm$ 2.10	50.35 (P<0.001*)	P <sub>1,2,3</sub> <0.001*
Applying ointment score	12.56 $\pm$ 3.20	22.16 $\pm$ 1.14	20.92 $\pm$ 1.41	185.08 (P<0.001*)	P <sub>1,2,3</sub> <0.001*
Change eye dressing score	9.76 $\pm$ 1.42	17.76 $\pm$ 1.36	17.08 $\pm$ 1.46	309.45 (P<0.001*)	P <sub>1,2,3</sub> <0.001*
eye care and infection control score	10.12 $\pm$ 1.42	22.64 $\pm$ 1.57	22.04 $\pm$ 1.67	766.90 (P<0.001*)	P <sub>1,2</sub> <0.001* P <sub>3</sub> =0.002*
Non pharmacological methods for pain control					
• Relaxation massage score	3.96 $\pm$ 1.85	11.92 $\pm$ 0.99	11.24 $\pm$ 1.20	475.40 (P<0.001*)	P <sub>1,2,3</sub> <0.001*
• Tense and relax exercise for eye score	35.64 $\pm$ 15.47	130.36 $\pm$ 18.19	129.40 $\pm$ 18.21	^46.58 (P<0.001*)	P <sub>1,2,3</sub> <0.001*
• Deep breath exercise total score	10.0 $\pm$ 1.73	12.80 $\pm$ 0.95	12.24 $\pm$ 0.83	68.88 (P<0.001*)	P <sub>1,2,3</sub> <0.001* P <sub>3</sub> =0.001*
Non pharmacological methods for pain control score	49.60 $\pm$ 17.37	155.08 $\pm$ 19.11	152.88 $\pm$ 19.28	^47.65 (P<0.001*)	P <sub>1,2,3</sub> <0.001*
Total performance score	102.84 $\pm$ 21.54	245.44 $\pm$ 22.84	239.84 $\pm$ 23.05	684.22 (P<0.001*)	P <sub>1,2,3</sub> <0.001*

F test: Repeated measures ANOVA ; \*: significant, P<sub>1</sub> Pre vs. Post, P<sub>2</sub>: Pre vs. Follow-up, P<sub>3</sub>: Post vs. Follow-up,

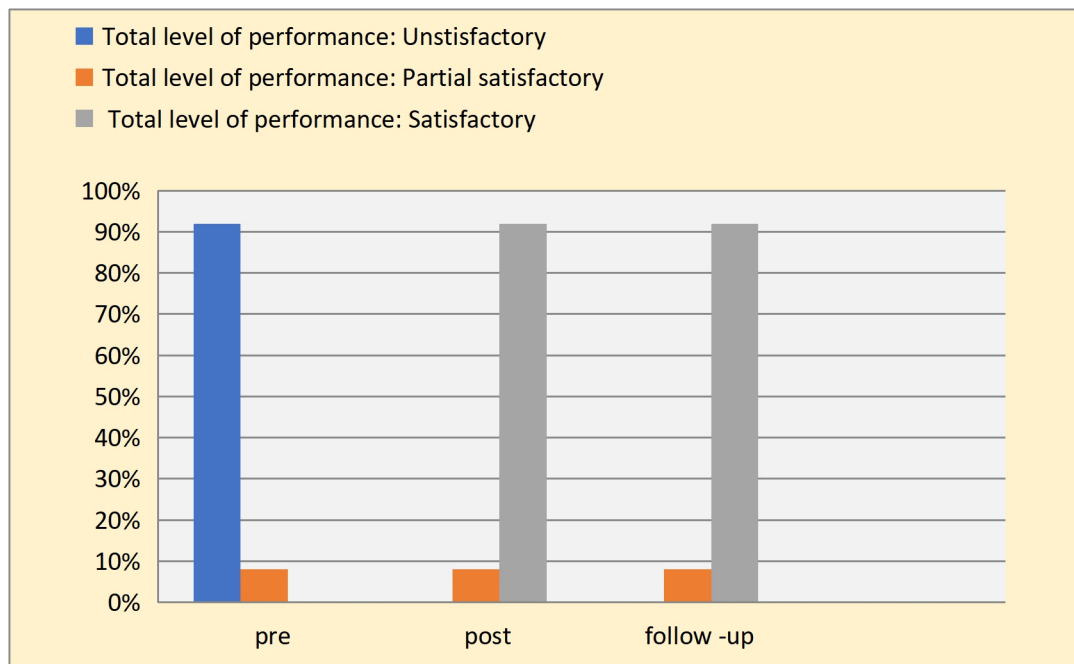


Fig (1): Percentage distribution of total performance levels among the studied nurses' group

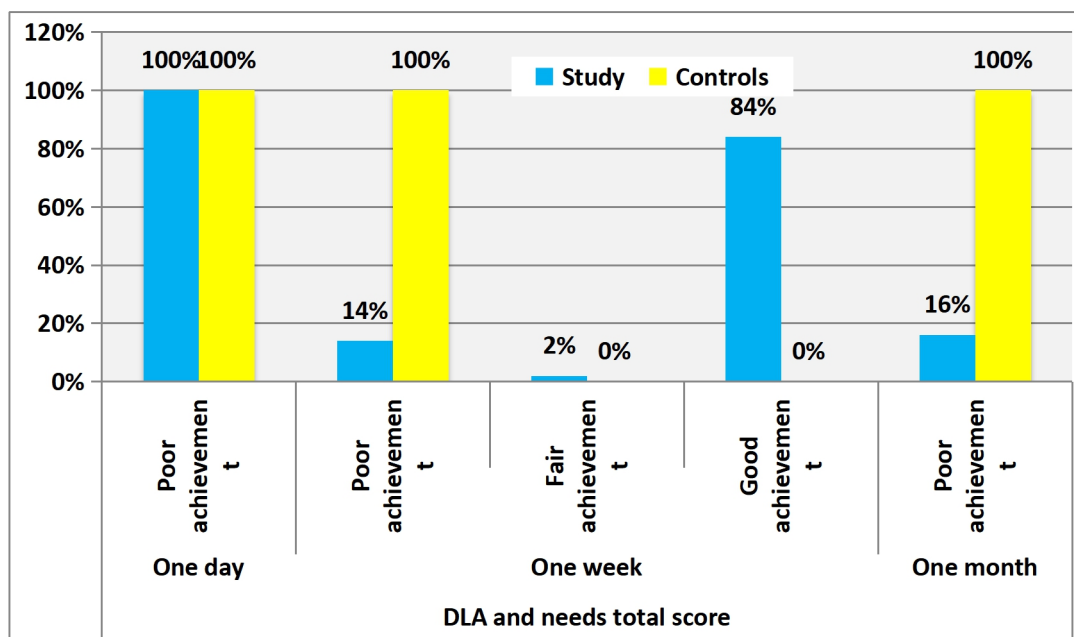
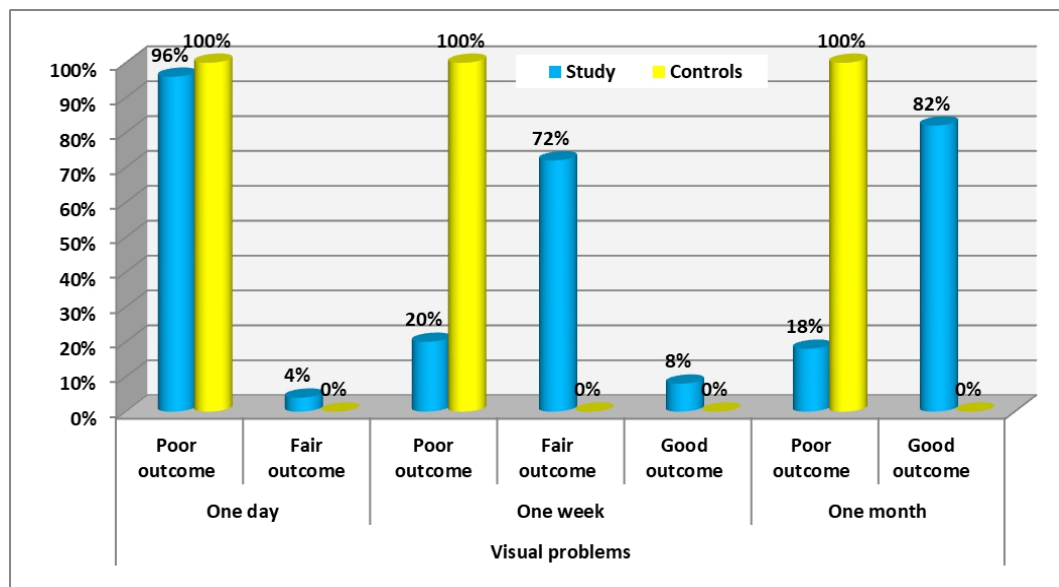


Fig (2): Percentage distribution of total levels of patient's daily activities and needs achievement after cataract surgery among the studied patients' groups (control & study)

**Table (5):** Mean scores for the study and control groups regarding visual problems

Visual problems total score	Control	Study	T- test	P value
	Mean $\pm$ SD	Mean $\pm$ SD		
One day post-operative	38.08 $\pm$ 1.56	37.86 $\pm$ 2.73	0.49	0.622
One - week post-operative	38.76 $\pm$ 1.42	26.56 $\pm$ 4.51	18.21	<0.001*
One - month post-operative	39.56 $\pm$ 1.77	23.94 $\pm$ 2.90	32.40	<0.001*

**Fig (3):** Percentage distribution of total levels of visual problems after cataract surgery among patients in the studied groups (control & study)

## Discussion

The present study tested the hypothesis that the implementation of educational nursing intervention will lead to statistically significant improvements in nurses' related knowledge and performance, and this would lead to better patients' outcomes post cataract surgery. The findings generally led to acceptance of this hypothesis that showed highly statistically significant improvements in nurses' knowledge and practice with consequent improvement in meeting the daily living activities and needs and with minimizing post - operative visual problems of cataract patients.

First hypothesis related to the nurses who receive educational nursing intervention have a higher score of knowledge than pre nursing intervention; the study findings clarified that there was a highly statistically improvement in nurses' knowledge mean score regarding eye

anatomy, cataract disease, nursing role and pre discharge instruction of cataract surgery.

From the researchers' point of view, the knowledge deficit about anatomy of the eye isn't less important than lack the knowledge about nurse role as without this knowledge the nurses would not be able to provide the care needed. The finding was in contrast with Taha and Abd Elaziz, (2018) & Belal et al., (2004) who reported that nurses' knowledge of the anatomy and physiology of the eye was unsatisfactory.

Moreover, the current study finding was in agreement with El Shafaey and Basal, (2018) who revealed that, all of the studied nurses had a good level of knowledge score immediately post- implementation of teaching program. Also, in line with El-Mowafi, (2019) who showed that score of knowledge was improved post immediate implementation of the program to good level with highly statistically significant improvement.

Additionally, the findings of the current study were in line with Kareem and Hamza, (2019) who revealed that there was an improvement in the nurses' knowledge after application of the education program than before application. The implementation of nursing intervention led to significant improvements in nurses' knowledge in all tested areas, and this improvement was retained throughout the follow-up. This improvement indicates positive impact of the intervention on nurses' knowledge, and this was further confirmed through multi analysis which identified the intervention as a significant independent positive predictor of the improvement in nurses' knowledge. A similar success of an intervention in improving nurses' knowledge about eye care was demonstrated in a study in Taha and Abd Elaziz, (2018).

Second hypothesis related to the nurses who receive nursing intervention have a higher level of performance than pre intervention; the current study finding revealed that, there was highly statistically significant improvement in total mean nurses' performance score related to instilling eye drops, applying ointment, change eye dressing, eye care and infection control and non-pharmacological methods for pain control, there was a very highly statistically significant difference in nursing practice pre- intervention, post- intervention and follow up. The majority of studied nurses had unsatisfactory level of practice pre- intervention but post-intervention had a satisfactory level of practice and also after one week of intervention as a follow up in which the majority had a satisfactory level of practice performance.

This result was agreed with El Shafaey and Basal, (2018) who also demonstrated a major deficiency in nurses' performance of post-operative care for cataract patients before implementation of the guidelines. It was a striking finding that none of them could adequately perform the application of eye ointment, eye dressing using infection control, and non-pharmacologic pain relief.

Moreover, the current finding went in line with Ahmed, (2007) in a study at Zagazig University Hospital who reported that more than three quarters of the nurses performed eye care incorrectly. This result may be due to lack of

nurses' knowledge regarding importance of eye care following cataract surgery.

On the other hand, the result disagreed with El Shafaey and Basal, (2018) who found that, the majority of the studied nurses had fair level of practice score pre implementation of teaching program while the score was good immediately post- implementation of teaching program.

From the researchers' point of view, the implementation of educational nursing intervention led to significant improvements in nurses' performance in all tested areas especially in non-pharmacological management for pain control pre-intervention as compared with post-intervention and after one week as a follow up.

Third hypothesis related to the patients' daily living activities and needs are mostly met post educational nursing intervention as compared with pre intervention; the current study results revealed that the improvement of nurses' knowledge and performance led to a major achievement in patients' daily living activities and needs post- intervention for the study group as compared with pre-intervention for the control group. There were highly statistically significant achievement in meeting patients' daily living activities and needs after one week and one month post-operative as evidence of an improvement in total score of meeting daily living activities and needs after surgery as well as the majority of the study group had a good achievement post-interventions after one week and one month. This result was in the line with Rho and Khanna, (2012) who revealed higher score on the postoperative self-care compliance questionnaire especially regarding the care of hygiene, protection of operation side, activity of daily living and eye drop administration.

Also, the current study result agreed with Taha and Abd Elaziz, (2018) who founded that the improvement of nurses' knowledge and practice led to significant improvements in achievement of all patients' needs after guidelines' implementation compared with baseline. The present finding was in agreement with potter and Perry, (2011) who showed that assisting patients to meet their needs is a fundamental and vital part of nursing care, and also agreed with El-Shamy, Shabaan and El-

Banna, (2018) who reported that meeting patients' needs led to better outcomes. Additionally, the current study results were agreed with Hegazy, et al. (2012) & Belal, et al. (2004) who presented that patients had a higher need before the surgery instructions about: local anesthesia, permissible activities, sleep, food, unusual signs & symptoms, eye irrigation, medications and eye care.

In fact, the improvement in nurses' knowledge and practice had positive impact on the patients' daily living activities and needs achievement.

Fourth hypothesis related to patient's visual problems are lower post educational nursing intervention than pre nursing intervention for the control group; the present study showed that the improvement of nurses' knowledge and performance led to limitation of visual problems among cataract patients post-intervention for the study group. The majority of the study group had lowering visual problems and there was a statistically significant improvement of post-operative visual problems after one week and one month of intervention. This finding agreed with El Shafaey and Basal, (2018) who revealed the number of visual problems among the patients of the present study decreased after guidelines phase. Also, this finding agreed with Taha and Abd Elaziz, (2018) who revealed that the number of visual problems were statistically significant and was positive independent predictors of effective nursing interventions.

On the other hand, this finding was in contrast with El Shafaey and Basal, (2018) who reported that there is no statistical significance difference between cataract visual complications in relation to time after one postoperative week and month.

From the researchers' point of view, cataract surgery results need a multidisciplinary effort which includes perfect surgery, good nursing care and finally awareness of patient by postoperative precaution to be followed. It can be concluded that the educational nursing intervention significantly improved nurses' knowledge and practice about cataract with a sustained improvement in the patients' clinical outcomes and reducing visual complications.

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## Conclusions:

Based on the findings of the current study, it can be concluded that implementing educational nursing intervention to nurses for enhancing the care of patients undergoing cataract surgery had highly statistically significant positive effect and improvements on the studied nurses' knowledge and practice with a better achievement of patients' daily living activities & needs achievement and also with minimizing post-operative cataract visual problems.

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## Recommendations:

Based on the findings of the current study the following recommendations are suggested.

### A) Recommendations for nurses

1. Ophthalmic nurses should receive periodic training programs to improve, update and refresh their knowledge and performance regarding the care of the patients undergoing cataract surgery.
2. The hospital should motivate nurses, allow them to update their knowledge and make periodic follow up to nurses to assess their performance and effectiveness of care provided to ophthalmic patients
3. A simple booklet includes the most important instructional points regarding the care of the patients undergoing cataract surgery should be given to all ophthalmic nurses.

### B) Recommendations for patients:

1. Development of an educational nursing intervention for the patients undergoing cataract surgery about cataract and the essential daily living activities and needs for the patients undergoing cataract surgery to improve their knowledge which lead to decrease the possible visual complications.
2. A simple booklet includes the most important instructional points regarding cataract surgery should be given to all patients.
3. A comprehensive discharge plan and the importance of follow – up visits at the outpatient clinics.

**C) Recommendations for future researches:**

1. Replication of the study on a large sample size and with long term follow up to help generalization of the results.

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