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## Effect of Implementing Nursing Guideline on Nurses' Performance Regarding Patients Undergoing Cataract or Glaucoma Surgery

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**Abstract: Background:** Nowadays, intraocular surgery is widely performed and the ophthalmic nurse is the backbone of the eye care. Any deficiency in providing adequate nursing care pre or post eye surgery can lead to serious complications. **The study aimed to:** Evaluate the effect of implementing the nursing guideline on nurses' performance regarding patients undergoing cataract or glaucoma surgery. **Method:** Quasi-experimental research design was utilized to conduct this study. **Sample:** A convenience sample of 36 nurses working at Ophthalmology Mansoura Hospital was included in this study. **Tools:** Data were collected using two tools, first tool was pre/post structured questionnaire sheet, and it included two parts; part 1- included socio demographic characteristics of the studied nurses and part 2- included nurses' knowledge regarding the care provided to patients with cataract or glaucoma surgery. Second tool was pre/post observation checklist for nurses' practice pre, and post surgery. **Results:** Post implementing the guideline; there were high statistical significant differences in nurses' knowledge, preoperative practice, and postoperative practice ( $p < 0.001$ ) and a statistical significant relation was found between nurses' educational level with their knowledge, preoperative practice, and postoperative practice ( $p = 0.044, 0.050, 0.048$  respectively). **Conclusion:** Applying the designed nursing guideline is effective in improving nurses' knowledge, and practice regarding the care provided to patients with cataract or glaucoma surgery. **Recommendation:** It is recommended to; develop a specialized orientation program for the newly appointed nurses, provide the nurses with continuous training courses, set restrict supervision on nurses' application for infection control precautions, and encourage them to become involved in research studies.

**Keywords:** Intraocular surgery, Nursing guideline, Ophthalmic nurse, Postoperative, Preoperative.

### INTRODUCTION

Intraocular surgery is the surgical technique which is performed within the sensitive tissues of the eye. It includes various types such as cataract- removal surgery, glaucoma-filtrating surgery, corneal surgery, and vitreoretinal surgery [1]. According to estimations of the World Health Organization (WHO), Cataract and glaucoma diseases are considered the most common ocular conditions affecting vision in the world [2].

Cataract is a cloudy area in the eye lens which develops gradually and prevents the clear vision by blocking the passage of the light to the eye retina [3]. It is considered the leading cause of curable blindness in both developed and developing countries [4] and it accounts for 51% of the world's blind cases [5]. According to statistical estimation of the Ophthalmology Mansoura Hospital in 2017, there were about 4.700 patients with cataract disease admitted to the hospital [6].

Concerning to glaucoma disease, it is a blinding disease associated often with the elevation in eye pressure which leads to degeneration of retinal ganglion cells causing irreversible vision loss [7]. Glaucoma will affect 80 million people in the world by 2020; with approximately 11 million people will be bilaterally blind [8]. Regarding to statistical estimation of the Ophthalmology Mansoura

Hospital in 2017, there were about 2.550 patients with glaucoma disease admitted to the hospital for treatment [6].

The nurse plays a significant role in providing care to intraocular surgical patients and her role begins in the preoperative stage throughout proper evaluation of the patient that leads to reduction of the cancelled surgical operations at the date of operation [9]. Additionally, she is responsible for providing patients with necessary information and meeting their physical and psychological needs [10]. For the success of the postoperative phase, the nurse should emphasize on minimizing patient's pain and discomfort, involving the patient and his family in postoperative care, preventing complications as possible, and providing complete discharge instructions [11].

The aim of the nursing guideline is to identify proper clinical practice with avoiding as possible untoward incidents and clinical negligence, set standards for patient's safety that enhance the quality of care, and achieve the required surgical outcomes [12].

#### Significance of the Study:

Ophthalmic nurse as a part of health team plays a fundamental role pre, and post intraocular surgery and she can positively affect the quality and efficiency of the surgical journey; therefore, she should update her knowledge and practice regarding the ophthalmic care

provided to patients to achieve the required surgical outcomes [13].

Applying the nursing guideline pre, and post intraocular surgery will be very useful in enhancing nursing care, promoting work quality, helping patient to actively participate in nursing process, creating a reliable professional environment, promoting cooperation and communication among nurses, decreasing incidence of surgical complications, and enhancing nursing effect during recovery period [14].

Despite the importance of the nursing guideline for above reasons, there is no existing nursing guideline to manage preoperative and postoperative care in ophthalmology. So, there is an urgent need to conduct this study to evaluate nurses' knowledge and practice regarding the care provided to patients with cataract or glaucoma surgery.

#### **Aim of the Study:**

The aim of this study was to evaluate the effect of implementing the nursing guideline on nurses' performance regarding patients undergoing cataract or glaucoma surgery.

#### **Research Hypothesis:**

The research hypothesis was that, post implementing the guideline, nurses' knowledge and practice regarding care provided to patients with cataract or glaucoma surgery would be improved

### **SUBJECT AND METHOD**

**Research design and setting:** A quasi-experimental research design was used to conduct this study at Ophthalmology Mansoura Hospital.

**Study sample:** A convenience sample of 36 nurses providing care to the ophthalmic patients was included in this study.

**Tools of data collection:** Data was collected pre/post the guideline using two tools:-

**Tool I: A structured questionnaire sheet;** the researcher designed this tool in simple Arabic Language after extensive reviewing of the related literatures and after content-validation by obtaining experts' opinion in the field of Ophthalmology and in the field of Medical-Surgical Nursing. It consists of two parts: Part 1: Socio-demographic characteristics of the studied nurses; it included questions related to personal characteristics of the studied nurses which composed of (6) questions. Part 2: Nurses' knowledge regarding the care provided to patients with cataract or glaucoma surgery; it included (40) questions covering 3 main areas: 1) Anatomy of the eye. 2) Eye disease (cataract & glaucoma). 3) Nursing care pre, and post cataract & glaucoma surgery.

**Scoring system;** the answers of the nurses were evaluated using model answer prepared by the researcher and the correct answer was scored one while the incorrect answer or don't know were scored zero. The scores of each area were summed-up to give the total score, After that, the score was converted to be a percent score which was transferred into categories as follow:- Low: For those who

had a score < 60.0%. Moderate: For those who had a score 60.0% to 80.0%. High: For those who had a score > 80.0%.

**Tool II: Observation checklist for nurses' practice;** the researcher designed this tool after extensive reviewing of the related literatures and after content-validation by obtaining experts' opinion in the field of Ophthalmology and in the field of Medical-Surgical Nursing to assess the nurses' actual practice regarding the care provided to patients with cataract or glaucoma surgery. It was used pre, and post implementation of the guideline and covered the following: Preoperative nursing interventions; it assessed nurses' practice in 7 parts, included: 1)Obtaining patient's health history (7) steps, 2)Assistance physician in patient's physical examination (3) steps, 3)Ensuring that patient has done all necessary investigation (3) steps, 4)Providing preoperative health teaching (9) steps, 5)Obtaining preoperative consent form (3) steps, 6)Providing preoperative physical preparations (14) steps , and 7)Providing preoperative psychological care (6) steps. Postoperative nursing interventions; it assessed nurses' practice in 5 parts, included: 1)Eye drops instillation (15) steps. 2)Applying eye ointment (13) steps. 3)Eye dressing changing with following aseptic technique (13) steps. 4) Performing eye care (11) steps. 5) Providing complete discharge instructions (9) steps.

**Scoring system;** the researcher checked each step of nurses' practice if it done or not done and the done step was scored one while the not done was scored zero. The scores of each part were summed-up to give the total score, and then the total score was converted to be a percent score which was transferred into categories as follow:- Poor: For those who had a score < 60.0%. Fair: For those who had a score 60% to 80.0%. Good: For those who had a score > 80.0%.

**Validity of the tools:** The content validity was established by a panel of five experts; two of them were assistant professors in the field of Ophthalmology and three of them were lecturers in the field of Medical-Surgical Nursing at Mansoura University who reviewed the tools for clarity, comprehensiveness, relevance, applicability, understanding, and simplicity for the implementation and some modifications were applied according to their opinions.

**Reliability of the tools:** Reliability test was done by using Cronbach's Alpha and was in knowledge, preoperative practice, and postoperative practice ( $\alpha = 0.860, 0.878, 0.913$  respectively) and they are considered "very good".

**Pilot study:** The sample of the pilot study included 4 nurses (10%) who were randomly selected from 40 nurses under the study to ascertain from tools' clarity, feasibility, and its applicability and in order to estimate the required time that the nurses needed to fill them in. Then the researcher made the necessary modifications according to results of the pilot study.

**Fieldwork:** The study was implemented through the following four phases, and was conducted over a period of

eight months which started from May 2017 to December 2017:

**Assessment phase:** The researcher started this phase by introducing herself to the studied nurses and explaining the purpose of the study to them. Then, an oral consent from each nurse participated in the study was obtained. After that, the knowledge of each nurse was assessed individually using a structured questionnaire sheet filled in about 20 to 30 minutes. This was followed by observing nurses' skills pre, and post cataract & glaucoma surgery; the observing span was 3 hours per day in different shifts to fill the practice checklist of the studied nurses.

**Planning phase:** Based on the assessed data, and through internet searching and literature review for the relevant information, the researcher developed nursing guideline under the supervisors' guidance for caring of patients with cataract or glaucoma surgery. It covered knowledge regarding eye anatomy and knowledge about cataract & glaucoma diseases. In addition, it included required nursing knowledge and skills regarding the ophthalmic care pre, and post cataract & glaucoma surgery.

**Implementation phase:** The researcher presented the nursing guideline to the studied nurses in five sessions through two weeks; each session took between 30 – 45 minutes. The nurses were divided into six groups, each one contained six nurses. Diverse teaching media were used involved; group discussion, questionnaire as well as demonstration and actual performance on patients. In addition, diverse teaching methods were used involved; colored pictures, data show, video tapes, and real materials. Before beginning the sessions, the researcher presented an orientation about the whole nursing guideline. Before beginning the sessions, the researcher presented an orientation about the whole nursing guideline. After that, each session was presented with a summary of what had been explained previously. Reinforcement and motivation were used by the researcher through the sessions to enrich nurses' learning.

**Evaluation phase:** Immediately after implementing the nursing guideline, the evaluation of the guideline's effect on nurses' knowledge and practices (post-test) was carried out using the same tools which were used in the assessment

phase. The researcher compared the post-test results with the pre-test results to evaluate the impact of the guideline on nurses' knowledge and practices.

**Administrative design and ethical considerations:** The researcher obtained an official permission before collecting the data from the director of Ophthalmology Mansoura Hospital at which the study conducted after explaining the aim of the study and all relevant ethical considerations were taken during this study including; obtaining an approval from the ethical committee of the Faculty of Nursing, Mansoura University to carry out this study, explaining the purpose of the study to each nurse and obtaining an oral consent from each nurse participated in the study. Also, maintaining the privacy and confidentiality of the studied nurses during data collection. In addition, voluntary participation was given to them, as they had the right to refuse the participation or withdraw at any time they want from the study.

**Statistical design:** The collected data was coded, processed then analyzed using the Statistical Package of Social Science (SPSS version 20). The quantitative data was presented in mean and standard deviation (SD), while the qualitative data was presented as number (N) and percent (%). Chi square test was used for testing significance of the data, while Monte Carlo test was used to test significance, if the expected cell count was less than 5 in tables with more than four cells. P value  $\leq 0.05$  indicates a significant result. Pearson correlation was done between variables and Cronbach's alpha was used to measure internal consistency.

## RESULTS

**Table (1):** Revealed that the majority of the studied nurses were females (94.4%), and the distribution of age group was similar (50%) for both second and third decade, with a mean age  $\pm$  SD (29.7  $\pm$  5.5). Concerning to educational level, 41.7% of the studied nurses held a Bachelor degree in nursing. In reference to years of experience in the field of ophthalmology, 36.1% of the studied nurses had (5-9 years) and the same percent (36.1%) had (10-14 years) of experience. Majority of the studied nurses (80.6%) did not reported attending previous training courses related to nursing ophthalmic care.

**Table (1): Distribution of the studied nurses according to their socio-demographic characteristics (n=36).**

Nurses' characteristics	No.	%
<b>Gender:</b>		
▪ Female	34	94.4
▪ Male	2	5.6
<b>Age (years):</b>		
▪ 20-	18	50
▪ 30-	18	50
<b>Range</b>	21-39	
<b>Mean <math>\pm</math> SD</b>	29.7 $\pm$ 5.5	
<b>Education level:</b>		
▪ Diplom of Nursing	12	33.3
▪ Nursing Technician Institute	8	22.2
▪ Bachelor of Nursing	15	41.7
▪ Postgraduate	1	2.8

<b>Nursing experience:</b>		
▪ < 5 years	9	25
▪ 5-9 years	13	36.1
▪ 10-14 years	13	36.1
▪ 15 years or more	12.8	
<b>Attendance of training courses:</b>		
▪ No	29	80.6
▪ Yes	719.4	
<b>No. of attended courses (n = 7)*</b>		
▪ One	4	57.1
▪ Two	2	28.6
▪ Three	1	14.3

\*Excluding those who hadn't attended training courses before.

**Table (2):** Illustrated that pre implementation of the guideline; the lowest score in nurses' knowledge was regarding knowledge about eye anatomy, followed by knowledge about nursing care pre, and post eye surgery as low knowledge scores were (83.3% & 63.9% respectively), and post implementation; these low scores were decreased to be (11.1% & 8.3% respectively).

Concerning to the highest knowledge score, it was regarding knowledge about cataract and glaucoma diseases as 41.7 % of the nurses obtained a high knowledge score and post implementation; this high score was increased to be 77.8 %.

The table also presented that, just 8.3 % of the studied nurses had a total high knowledge score compared with 75.0 % post implementation of the guideline, showing high statistical significant difference ( $p < 0.001$ ).

**Table (2): Difference between nurses' knowledge level pre, and post implementation of the guideline (n=36).**

Knowledge items	Phase		P value	Test of significance
	Pre guideline No. %	Post guideline No. %		
<b>Knowledge about eye anatomy</b>				
▪ Low	30 83.3	4 11.1	< 0.001**	$\chi^2 = 37.97$
▪ Moderate	4 11.1	16 44.4		
▪ High	2 5.6	16 44.4		
<b>Knowledge about cataract and glaucoma diseases</b>				
▪ Low	8 22.2	0 0.0	< 0.001**	Monte Carlo test
▪ Moderate	13 36.1	8 22.2		
▪ High	15 41.7	28 77.8		
<b>Knowledge about nursing care pre, and post eye surgery</b>				
▪ Low	23 63.9	3 8.3	< 0.001**	$\chi^2 = 18.21$
▪ Moderate	6 16.7	9 25		
▪ High	7 19.4	24 66.7		
<b>Total knowledge</b>				
▪ Low	11 30.6	0 0.0	< 0.001**	$\chi^2 = 35.65$
▪ Moderate	22 61.1	9 25.0		
▪ High	3 8.3	27 75.0		

Low: score < 60.0% P value is significant if  $\leq 0.05$

Moderate: score 60.0 % to 80.0% \*\*Highly statistically significant result

High: score > 80.0%

**Table (3):** Demonstrated that pre implementation of the guideline; there were no statistical significant relations between nurses' gender, age, educational level, years of experiences, attendance of training courses and their

knowledge ( $p = 0.090, 0.213, 0.083, 0.355, 0.098$  respectively), while post implementation; there was a statistical significant relation between nurses' educational level and their knowledge ( $p = 0.044$ ).

**Table (3): Relation between nurses' socio-demographic characteristics and their knowledge pre, and post implementation of the guideline (n=36).**

Nurses' characteristics	knowledge pre guideline						MCP*	knowledge post guideline						MCP*	
	Low (n=11)		Moderate (n=22)		High (3)			Low (n=0)		Moderate (n=9)		High (n=27)			
	No.	%	No.	%	No.	%		No.	%	No.	%	No.	%		
<b>Gender:</b>															
▪ Female	9	81.8	22	100	3	100	0.090	0	0.0	7	77.8	27	100	0.070	
▪ Male	2	18.2	0	0.0	0	0.0		0	0.0	2	22.2	0	0.0		
<b>Age (years):</b>															
▪ 20-	7	63.6	11	50.0	0	0.0	0.213	0	0.0	5	55.6	13	48.1	0.189	
▪ 30-40	4	36.4	11	50.0	3	100			0	0.0	4	44.4	14		51.9
<b>Education level:</b>															
▪ Diplom of Nursing	6	54.5	6	27.3	0	0.0	0.083	0	0.0	3	33.3	9	33.3	0.044*	
▪ Nursing Technician Institute	3	27.3	5	22.7	0	0.0			0	0.0	3	33.3	5		18.5
▪ Bachelor of Nursing	2	18.2	10	45.5	3	100			0	0.0	3	33.3	12		44.5
▪ Postgraduate	0	0.0	1	4.5	0	0.0			0	0.0	0	0.0	1		3.7
<b>Nursing experience:</b>															
▪ < 5 years	3	27.3	6	27.3	0	0.0	0.355	0	0.0	3	33.3	6	22.2	0.278	
▪ 5-9 years	5	45.5	8	36.4	0	0.0			0	0.0	3	33.3	10		37.0
▪ 10-14 years	3	27.3	7	31.8	3	100			0	0.0	2	22.2	11		40.8
▪ 15 years or more	0	0.0	1	4.5	0	0.0			0	0.0	1	11.1	0		0.0
<b>Attendance of training courses:</b>															
▪ No	10	90.9	18	81.8	1	33.3	0.098	0	0.0	5	55.6	24	88.9	0.077	
▪ Yes	1	9.1	4	18.2	2	66.7			0	0.0	444.4	3	11.1		

MCP:P value based on Monte Carlo exact probability

P value is significant if ≤ 0.05

**Table (4):** Presented that pre implementation of the guideline; the lowest score in nurses' preoperative practice was regarding obtaining complete patient's history, followed by providing the psychological care, and then providing preoperative health teaching as poor practice scores were (72.2%, 63.9%, 58.3% respectively), and post implementation; these poor scores were decreased to be (22.2%, 16.7%, 11.1% respectively).

Concerning to the best practice score, it was regarding obtaining surgical consent, followed by physical preparation of the patient as good practice scores were (80.6% & 75.0% respectively), and post implementation; these two scores were improved to be (91.7% & 86.1% respectively).

The table also presented that, just 19.4 % of the studied nurses had a total good score in their preoperative practice compared with 72.2 % post implementation of the guideline, showing high statistical significant difference (p < 0.001).

**Table (4): Difference between nurses' preoperative practice level pre, and post implementation of the guideline (n=36).**

Preoperative practice domains	Phase				P value	Test of significance
	Pre guideline		Post guideline			
	No.	%	No.	%		
<b>Obtaining complete history</b>					< 0.001**	$\chi^2 = 21.85$
▪ Poor	26	72.2	8	22.2		
▪ Fair	8	22.2	11	30.6		
▪ Good	2	5.6	17	47.2		
<b>Assistance in physical examination</b>					< 0.001**	Monte Carlo test
▪ Poor	6	16.7	1	2.8		
▪ Fair	20	55.6	7	19.4		
▪ Good	10	27.8	28	77.8		
<b>Ensuring doing preoperative investigations</b>					< 0.001**	Monte Carlo test
▪ Poor	4	11.1	0	0.0		
▪ Fair	13	36.1	0	0.0		
▪ Good	19	52.8	36	100		
<b>Providing health teaching</b>					< 0.001**	$\chi^2 = 26.32$
▪ Poor	21	58.3	4	11.1		
▪ Fair	11	30.6	8	22.2		
▪ Good	4	11.1	24	66.7		
<b>Obtaining surgical consent</b>					0.437	Monte Carlo test
▪ Poor	2	5.6	1	2.8		
▪ Fair	5	13.9	2	5.6		
▪ Good	29	80.6	33	91.7		
<b>Physical preparation of patient</b>					0.320	Monte Carlo test
▪ Poor	2	5.6	0	0.0		
▪ Fair	7	19.4	5	13.9		
▪ Good	27	75.0	31	86.1		
<b>Providing psychological care</b>					< 0.001**	$\chi^2 = 20.67$
▪ Poor	23	63.9	6	16.7		
▪ Fair	9	25.0	10	27.8		
▪ Good	4	11.1	20	55.6		

<b>Total preoperative practice</b>						
▪ Poor	9	25.0	0	0.0	< 0.001**	Monte Carlo test
▪ Fair	20	55.6	10	27.8		
▪ Good	7	19.4	26	72.2		

χ<sup>2</sup>: Chi- square test

Poor: score < 60.0%

\*\*Highly statistically significant result

Fair: score 60.0% to 80.0%

P value is significant if ≤ 0.05

Good: score > 80.0%

**Table (5):** Demonstrated that pre implementation the guideline; there were no statistical significant relations between nurses' gender, age, educational level, years of experiences, attendance of training courses and their

preoperative practice level (p = 0.113, 0.653, 0.095, 0.760, 0.289 respectively), while post implementation; there was a statistical significant relation between nurses' educational level and their preoperative practice level (p = 0.050).

**Table (5): Relation between nurses' socio-demographic characteristics and their preoperative practice pre, and post implementation of the guideline (n=36).**

Nurses' characteristics	Preop practice pre guideline						MCP*	Preop practice post guideline						MCP*
	Poor (n=9)		Fair (n=20)		Good (n=7)			Poor (n=0)		Fair (n=10)		Good (n=26)		
	No.	%	No.	%	No.	%		No.	%	No.	%	No.	%	
<b>Gender:</b>														
▪ Female	7	77.8	20	100	7	100	0.113	0	0.0	9	90.0	25	96.2	0.075
▪ Male	2	22.2	0	0.0	0	0.0		0	0.0	1	10.0	1	3.8	
<b>Age (years):</b>														
▪ 20-	6	66.7	9	45.0	3	42.9	0.653	0	0.0	4	40.0	14	53.8	0.255
▪ 30-40	3	33.3	11	55.0	4	57.1		0	0.0	6	60.0	12	46.2	
<b>Education level:</b>														
▪ Diploma of Nursing	4	44.4	7	35.0	1	14.3	0.095	0	0.0	4	40.0	8	30.8	0.050*
▪ Nursing Technician Institute	4	44.4	3	15.0	1	14.3		0	0.0	3	30.0	5	19.2	
▪ Bachelor of Nursing	1	11.1	9	45.0	5	71.4		0	0.0	3	30.0	12	46.2	
▪ Postgraduate	0	0.0	1	5.0	0	0.0		0	0.0	0	0.0	1	3.8	
<b>Nursing experience:</b>														
▪ < 5 years	4	44.4	3	15.0	2	28.6	0.760	0	0.0	3	30.0	6	23.0	0.368
▪ 5-9 years	3	33.3	8	40.0	2	28.6		0	0.0	3	30.0	10	38.5	
▪ 10-14 years	2	22.2	8	40.0	3	42.9		0	0.0	3	30.0	10	38.5	
▪ 15 years or more	0	0.0	1	5.0	0	0.0		0	0.0	1	10.0	0	0.0	
<b>Attendance of training courses:</b>														
▪ No	9	100	15	75.0	5	71.4	0.289	0	0.0	7	70.0	22	84.6	0.153
▪ Yes	0	0.0	5	25.0	2	28.6		0	0.0	33.0	4	15.4		

MCP:P value based on Monte Carlo exact probability

P value is significant if ≤ 0.05

**Table (6):** Illustrated that pre implementation of the guideline; the lowest score in nurses postoperative practice was regarding applying eye ointment, followed by instilling of eye drops, and then changing eye dressing with following aseptic techniques as poor practice scores were (61.1%, 52.8%, 50.0 % respectively), and post implementation; these poor scores were decreased to be (5.6%, 0.0%, 5.6% respectively).

Concerning to the best practice score, it was regarding providing complete discharge instructions, followed by performing eye care as good practice scores were (55.5% & 52.8% respectively), and post implementation; these two scores were improved to be (83.3% & 80.6% respectively).

The table also presented that, just 13.9 % of the studied nurses had a total good score in their postoperative practice compared with 80.6 % post implementation of the guideline, showing high statistical significant difference (p < 0.001).

**Table (6): Difference between nurses' postoperative practice level pre, and post implementation of the guideline (n=36).**

Post-operative practice domains	Phase				P value	Test of significance
	Pre guideline		Post guideline			
	No.	%	No.	%		
<b>Instillation of eye drops</b>					< 0.001**	χ <sup>2</sup> = 35.49
▪ Poor	19	52.8	0	0.0		
▪ Fair	14	38.9	12	33.3		
▪ Good	3	8.3	24	66.7		
<b>Applying eye ointment</b>					< 0.001**	χ <sup>2</sup> = 38.04
▪ Poor	22	61.1	2	5.6		
▪ Fair	12	33.3	8	22.2		
▪ Good	2	5.6	26	72.2		

<b>Changing eye dressing with following aseptic techniques</b>						
▪ Poor	18	50.0	2	5.6	< 0.001**	$\chi^2 = 35.42$
▪ Fair	13	36.1	4	11.1		
▪ Good	5	13.9	30	83.3		
<b>Performing eye care</b>						
▪ Poor	7	19.4	1	2.8	< 0.001**	$\chi^2 = 25.15$
▪ Fair	10	27.8	6	16.6		
▪ Good	19	52.8	29	80.6		
<b>Providing complete discharge instructions</b>						
▪ Poor	10	27.8	1	2.8	< 0.001**	$\chi^2 = 19.34$
▪ Fair	6	16.7	5	13.9		
▪ Good	20	55.5	30	83.3		
<b>Total postoperative practice</b>						
▪ Poor	10	27.8	0	0.0	< 0.001**	$\chi^2 = 46.26$
▪ Fair	21	58.3	7	19.4		
▪ Good	5	13.9	29	80.6		

□2: Chi- square test  
 P value is significant if ≤ 0.05  
 \*\*Highly statistically significant result

Poor: score < 60.0%  
 Fair: score 60.0% to 80.0%  
 Good: score > 80.0%

**Table (7):** Demonstrated that, pre implementation the guideline; there were no statistical significant between nurses' gender, age, educational level, years of experiences, attendance of training courses and their postoperative

practice (p = 0.126, 1.00, 0.091, 0.727, 1.00 respectively), while post implementation; there was a statistical significant between nurses' educational level, and their postoperative practice (p = 0.048).

**Table (7): Relation between nurses' socio-demographic characteristics and their postoperative practice pre, and post implementation of the guideline (n=36).**

Nurses' characteristics	Postop practice pre guideline						MCP*	Postop practice post guideline						MCP*
	Poor (n=10)		Fair (n=21)		Good (n=5)			Poor (n=0)		Fair (n=7)		Good (n=29)		
	No.	%	No.	%	No.	%		No.	%	No.	%	No.	%	
<b>Gender:</b>														
▪ Female	8	80.0	21	100	5	100	0.126	0	0.0	6	85.7	28	96.6	
▪ Male	2	20.0	0	0.0	0	0.0		0	0.0	1	14.3	1	3.4	
<b>Age (years):</b>														
▪ 20-	5	50.0	10	47.6	3	60.0	1.00	0	0.0	3	42.8	15	51.7	
▪ 30-40	5	50.0	11	52.4	2	40.0		0	0.0	4	57.2	14	48.3	
<b>Education level:</b>														
▪ Diplom of Nursing	5	50.0	4	19.0	3	60.0	0.091	0	0.0	3	42.8	9	31.0	
▪ Nursing Technician Institute	3	30.0	3	14.2	2	40.0		0	0.0	0	0.0	8	27.6	
▪ Bachelor of Nursing	2	20.0	13	62.0	0	0.0		0	0.0	4	57.2	11	38.0	
▪ Postgraduate	0	0.0	1	4.8	0	0.0		0	0.0	0	0.0	1	3.4	
<b>Nursing experience:</b>														
▪ < 5 years	3	30.0	4	19.0	2	40.0	0.727	0	0.0	2	28.6	7	24.0	
▪ 5-9 years	2	20.0	8	38.1	3	60.0		0	0.0	3	42.8	10	34.6	
▪ 10-14 years	5	50.0	8	38.1	0	0.0		0	0.0	2	28.6	11	38.0	
▪ 15 years or more	0	0.0	1	4.8	0	0.0		0	0.0	0	0.0	1	3.4	
<b>Attendance of training courses:</b>														
▪ No	9	80.0	18	85.8	3	60.0	1.00	0	0.0	4	57.2	25	86.2	
▪ Yes	0	20.0	3	14.2	2	40.0		0	0.0	342.8		4	13.8	

MCP:P value based on Monte Carlo exact probability

P value is significant if ≤ 0.05

**Table (8):** Showed that pre implementation the guideline; there were no statistical significant correlations between nurses' knowledge and their pre/or postoperative practice (r=0.296 at p=0.08 & r=0.303 at p=0.072 respectively),

while post implementation of the guideline; there were positive correlations between nurses' knowledge and their pre/ and postoperative practice (r=0.359 at p=0.032 & r=0.540 at p=0.001 respectively).

**Table (8): Correlations between nurses' knowledge and their pre, and postoperative practice pre, and post implementation of the guideline.**

Nurses' practice	Nurses' knowledge Pre guideline		Nurses' knowledge Post guideline	
	(r)	(p)	(r)	(p)
<b>Preoperative practice</b>	0.296	0.08	0.359	0.032*
<b>Postoperative practice</b>	0.303	0.072	0.540	0.001**

\* P value significant if ≤ 0.05  
 \*\*Highly statistically significant result  
 r= Correlation Coefficient

## DISCUSSION

Although intraocular surgery is often minimally invasive and considered low risk surgery but if it goes wrong, it will have a dramatic impact on patient's recovery and clinical outcomes. Ophthalmic nurses can play a crucial role in achievement required outcomes if they provide comprehensive, standardized, and systematic nursing care pre, and post eye surgery <sup>[15]</sup>.

This study was carried out to test the hypothesis that the implementing of the nursing guideline will lead to statistical significant improvement in nurses' knowledge and practice regarding the care provided to patients with cataract or glaucoma surgery at Ophthalmology Mansoura Hospital.

The findings of this study revealed that, the majority of the studied nurses did not report attending previous training courses related to nursing care in ophthalmic surgery. This result was in contrast with Mafwiri, Kisenge & Gilbert <sup>[16]</sup> who found that, above two-thirds of the nurses had received eye care training. This result might be because of shortage of the nursing staff which might influence on attending the training courses to prevent interruption of the work or this might be due to lacking of nurses' motivation as they felt that attending the training courses had no value for them and not affecting their salary.

As regards nurses' knowledge, the present study showed that, pre implementing the guideline; the majority of the studied nurses had a low level of knowledge regarding anatomy of the eye. This finding was in harmony with a study at Ain-Shams University Hospitals by Belal <sup>[17]</sup> who reported that, majority of the nurses had unsatisfactory level of knowledge about anatomy and physiology of the eye.

Also, Byamukama & Courtright <sup>[18]</sup> found that, most nurses in their study had a low level of knowledge about eye anatomy. From our point of view, this result might be because the nurses were not interested in knowing anatomical structure of the eye, but were interested in performing their nursing tasks added to their limited exposure to training courses about anatomy and physiology of the eye.

In relation to nurses' knowledge regarding nursing care pre and post eye surgery, it was noticed that, most nurses had a low level of the required knowledge pre guideline implementation. This was in agreement with Taha & Abd Elaziz <sup>[19]</sup> who found that, most nurses had insufficient knowledge about ophthalmic nursing care pre and post cataract surgery. Moreover, Hadavand & Heidary <sup>[9]</sup> recommended that, nurses needed to develop their knowledge regarding ophthalmic care to be good assistants to physicians and to meet patients' needs. This result might be due to the limited exposure of the studied nurses to training courses about ophthalmic care.

On the other hand, about little than one-quarter of the nurses had a low level of the knowledge regarding cataract and glaucoma disorders. A similar result was reported in a study of Ichhpujani, Bhartiya, Kataria & Topiwala <sup>[20]</sup> who reported that, most nurses had enough knowledge about

glaucoma disease. In contrast, Byamukama & Courtright <sup>[18]</sup> found that, most nurses had a low level of knowledge about basic eye diseases.

Post implementing the guideline, there was a marked improvement in nurses' knowledge as the majority of nurses had a high level of the knowledge in all tested areas. This indicated the positive effect of the guideline on nurses' knowledge and reflected that, nurses were able to learn and improve their knowledge. This finding was in agreement with Mafwiri et al. <sup>[16]</sup> who demonstrated in their study a similar success of the planned teaching in improving nurses' knowledge regarding ophthalmic care.

Regarding nurses' preoperative practice, the present study found that, pre implementing the guideline; nurses' preoperative practice level was generally unsatisfactory and there was a significant improvement in their preoperative practice post implementation.

According to obtaining complete history from the patients, it was observed that, the majority of the studied nurses failed to obtain completed preoperative health history. Similar result was reported in the study of Adugbire, Aziato & Dedey <sup>[21]</sup> who revealed that, most nurses in their study could not take comprehensive preoperative health history from their patients.

This result contradicted with Hardy <sup>[22]</sup> who emphasized on the importance of taking patient's history accurately and efficiently by the nurse pre eye surgery. It can be explained by, this result might be due to the nurses did not feel themselves responsible for obtaining patient's history, added to their dependence on the ophthalmologist in taking health history.

Regarding providing psychological care to the patients and their families, it was noticed that, the majority of the studied nurses did not provide the patients and their families with psychological care. This result was in agreement with Hegazy, M.Ragheb, S.Ragheb, Elsaid & Rashad <sup>[23]</sup> who mentioned in their study that, no psychological preparation was done by the nurses pre cataract surgery.

On the other hand, Zhang, Huang & Long <sup>[24]</sup> emphasized in their study on the significance of the psychological preparation pre ocular surgery to lower patients' negative emotions and to accelerate their physical recovery. Also, Hardy <sup>[22]</sup> stated that, patients needed to receive psychological preparation by the nurse pre eye surgery to decrease their anxiety and to gain their collaboration.

From authors' points of view, this result might be because the nurses in the current study did not aware of the importance of preoperative psychological care in helping the patient to cope with the surgical procedure and consequently achieving the required outcomes. Additionally, they believed that their role was limited on carrying out activities that were ordered by the physician and preparing the patient physically.

In relation to providing preoperative health teaching, it was found that the majority of the studied nurses neglected providing the patients and their families with appropriate



health teaching at the preoperative phase. Similar result was reported in the study of Beth, Lih & Kushalan <sup>[25]</sup> who revealed that, most nurses did not carry out the preoperative health teaching and they needed to be educative and supportive in caring for their patients who have undergone cataract surgery. Additionally, this result was in the same line with CK. Lee & IF. Lee <sup>[26]</sup> who stated that, the majority of the nurses in their study did not fully provide their patients with preoperative health teaching.

On the other hand, Lockey <sup>[27]</sup> in his study focused on the importance of providing the patient with verbal and written information pre eye surgery to assist him to be more physically and psychologically prepared. On the same line, Shen et al. <sup>[14]</sup> stressed on the role of ophthalmic nurses in providing health teaching to the patients preoperatively to enable them to cooperate better with medical and nursing staff and to facilitate the treatment during hospitalization and at rehabilitation stage.

The possible explanation of this result could be due to several causes such as large numbers of patients, multi-tasking for nurses with time constrain, tight operation schedules, and absence of a formal plan for providing information. This suggestion was supported by CK. Lee & IF. Lee <sup>[26]</sup> who stated that, tight operation schedules, nurses' time availability, and language barriers were considered the top barriers that affected provision of preoperative information.

Concerning preparing the patient physically, it was noticed that, three-quarters of the studied nurses performed patients' physical preparation completely and efficiently. Similar result was reported in the study of Sayin & Aksoy <sup>[28]</sup> who concluded that, most nurses gave a top priority to patients' physical preparation. In contrast, in the study of Christóforo & Carvalho <sup>[29]</sup> there was a deficiency regarding patient's physical preparation at the preoperative phase. In my opinion, this result might be because activities of physical preparation were considered as a routine care and often performed by the ophthalmic nurse.

Regarding obtaining the surgical consent form, the majority of the studied nurses had performed their role in obtaining the surgical consent. This result was in the same line with Ali, Lalani & Malik <sup>[30]</sup> who uncovered in their study that, high percentage of the nursing staff obtained the consent form pre surgery. Also, Agnew & Jorgensen <sup>[31]</sup> emphasized on the importance of supporting the consent process of the surgical patients by the nurse. This result might be because this practice is considered as a hospital policy pre surgery, and the legal responsibility lies on the nurse if she did not verify the validity of the informed consent.

Post implementing the guideline, there was a significant improvement in the total and sub-total preoperative nursing practice in comparison with their practice pre implementing the guideline. This indicated the positive effectiveness of the guideline on nurses' preoperative practice. In agreement with our finding, the study of Huang, Chuang & Chiang <sup>[32]</sup> demonstrated the effectiveness of the structured education program in improving nurses' practice.

Concerning nurses' postoperative practice, the present study found that, pre implementation of the guideline; nurses' postoperative practice was generally unsatisfactory and there was a significant improvement in their postoperative practice post implementation.

The findings of this study revealed that, the highest percentage of the studied nurses did not practice the instillation of eye drops and eye ointment correctly and most of them did not give attention to importance of following infection control measures while administrating eye medications. This was in the same line with a study of Taha & Abd Elaziz <sup>[19]</sup> who uncovered a deficient practice among ophthalmic nurses in administrating topical eye medications, especially eye ointment as none of them could adequately perform eye ointment application.

Watkinson <sup>[33]</sup> emphasized on the significance of proper instillation and washing hand to prevent eye infection in the operated eye. Also, Shaw <sup>[34]</sup> highlighted the importance of effective hand hygiene and following standard precaution by the nurse during instilling eye medications. This can be clarified by several aspects, which included; time-limited, work over load, added to nurses' dependence on their wrong experience in instilling eye medications.

In relation to changing eye dressing with following aseptic technique measures, the present study revealed that, most studied nurses did not follow aseptic technique measures when changing eye dressing. Similar result was reported in the study of Taha & Abd Elaziz <sup>[19]</sup> who concluded that, none of the studied nurses could adequately change eye dressing with following aseptic technique measures. On the other hand, Stollery, Shaw & Lee <sup>[35]</sup> emphasized on the significance of following aseptic technique measures when changing eye dressing, which was not performed by most nurses in the present study. This result might be because the studied nurses depended on their acquired wrong experience in changing eye dressing rather than on the correct knowledge and evidence.

Regarding performing eye care, the present study showed that, above half of the studied nurses obtained a good practice score in performing eye care. On the contrary, Ahmed <sup>[36]</sup> found that, three-quarters of the nurses in his study performed eye care incorrectly. Additionally, this finding was in contrast with a study at North Palestine Hospital by Fashafsheh, Morsy, Ismael & Alkaiasi <sup>[37]</sup> who cited that, the highest percentage of the nurses had a major deficiency in their practices regarding eye care.

Concerning providing complete discharge instructions, the present study showed that, above half of the studied nurses gave complete discharge instructions to patients and their families. This result was congruent with Hickman, W.L. White & W.A. White <sup>[38]</sup> who focused on the importance of providing patients with complete discharge instructions to achieve proposed surgical outcome and to increase patient's compliance with the treatment post eye surgery.

On the contrary, in the study of Mohammed <sup>[39]</sup> most nurses provided their patients with incomplete unplanned instructions at discharge. Also, Watkinson <sup>[33]</sup> founded that,

patients did not receive adequate instructions at discharge. From authors' point of view, this result might be because of patient's multiple questions to the nurse at the discharge about medications, permissive and non-permissive activities, usual and unusual signs, and follow up visits, added to the nurses believed that, they are in an assistant position with the physicians to give the discharge instructions to patients

Post implementing the guideline, there was a significant improvement in nurses' total and sub-total postoperative practice in comparison with their practice pre implementing the guideline. This indicated the positive effectiveness of the guideline on nurses' postoperative practice. In agreement with our finding, the study of Taha & Abd Elaziz [19] demonstrated the effectiveness of the structured education program in improving nurses' postoperative practice.

The present study found that, there was no statistical significant relation between nurses' gender and their knowledge and practice pre guideline implementation. This was in the same line with the study of Fashafsheh et al. [37] who found that, there was no statistical significant relation between nurses' gender and their total knowledge and practice. On the contrary, in the study of Fashafsheh, Ayed, Eqtaït & Harazneh [40] there was a significant relationship between nurses' knowledge and practice towards gender.

Regarding nurses' age, the current study revealed no statistical significant relation between nurses' age and their knowledge and practice. This result agreed with the results of Huang et al. [32] who reported no statistical significant relation between nurses' age and their knowledge and practice. This was inconsistent with Hafez [41] who conducted that, nurses' age had an effect on their knowledge and practice improvement.

Regarding educational level, the current study showed that, post implementing the guideline; there was a statistical significant relation between nurses' educational level and their total knowledge and practice as the level of nurses' knowledge and practice improved with increasing their level of education. This was inconsistent with Huang et al. [32] who reported no statistical significant relation between nurses' qualification and their knowledge and practice. From my point of view, this result might be because the highly qualified nurses were more likely to acquire new knowledge easier and faster than others. Also, they had the ability to apply the newly acquired knowledge which reflected on their practice when performing nursing care toward patients.

Regarding experience years, the current study revealed no statistical significant relation between nurses' experience and their knowledge and practice. Similar result was seen in the study of Fashafsheh et al. [37] who reported no statistical significant relation between nurses' experience and their knowledge and practice. This was inconsistent with Suchitra & Devi [42] who revealed that, nurses' level of knowledge and practice increased with greater years of experience. Also, this result was inconsistent with Hafez [41] who conducted that, increasing nurses' experience had an effect on improving their knowledge and practice.

In relation to training courses, the present study found that, there was no statistical significant relation between attending the training courses and improvement of nurses' knowledge and practice. Similar result was seen in the study of Fashafsheh et al. [40] who reported no statistical significant relation between nurses' knowledge and practice scores towards attending training courses.

The study found that, post implementing the guideline; there were statistical significant correlations between nurses' knowledge and their pre, and postoperative practice. This result was in agreement with the study of Taha & Abd Elaziz [19] who found a significant correlation between nurses' knowledge and their postoperative practice score. Also, this result was in the same direction with Hunter [43] who concluded that, the level of nurses' practice influenced by their level of knowledge.

## CONCLUSION

Based on the findings of this study; total nurses' knowledge, preoperative practice, and postoperative practice regarding the care provided to patients with cataract or glaucoma surgery were not good. Applying the designed nursing guideline could significantly improve their knowledge, preoperative practice, and postoperative practice, which consequently led to improvement the quality of nursing care as well as increasing patients' satisfaction.

## RECOMMENDATIONS

In the light of the findings of the study, It is recommended to; develop a specialized orientation program for the newly appointed nurses, provide the nurses with continuous training courses, set restrict supervision on nurses' application for infection control precautions and the ophthalmic nurses should be encouraged to become involved in clinical research studies.

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